

SECTION II
MATERIALS

2023

ASME Boiler and
Pressure Vessel Code
An International Code

Part D
Properties (Customary)

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AN INTERNATIONAL CODE

2023 ASME Boiler & Pressure Vessel Code

2023 Edition

July 1, 2023

II MATERIALS

Part D

Properties (Customary)

ASME Boiler and Pressure Vessel Committee
on Materials



The American Society of
Mechanical Engineers

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: July 1, 2023

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Library of Congress Catalog Card Number: 56-3934

Adopted by the Council of The American Society of Mechanical Engineers, 1914; latest edition 2023.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

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FOREWORD*

In 1911, The American Society of Mechanical Engineers established the Boiler and Pressure Vessel Committee to formulate standard rules for the construction of steam boilers and other pressure vessels. In 2009, the Boiler and Pressure Vessel Committee was superseded by the following committees:

- (a) Committee on Power Boilers (I)
- (b) Committee on Materials (II)
- (c) Committee on Construction of Nuclear Facility Components (III)
- (d) Committee on Heating Boilers (IV)
- (e) Committee on Nondestructive Examination (V)
- (f) Committee on Pressure Vessels (VIII)
- (g) Committee on Welding, Brazing, and Fusing (IX)
- (h) Committee on Fiber-Reinforced Plastic Pressure Vessels (X)
- (i) Committee on Nuclear Inservice Inspection (XI)
- (j) Committee on Transport Tanks (XII)
- (k) Committee on Overpressure Protection (XIII)
- (l) Technical Oversight Management Committee (TOMC)

Where reference is made to “the Committee” in this Foreword, each of these committees is included individually and collectively.

The Committee’s function is to establish rules of safety relating only to pressure integrity, which govern the construction* of boilers, pressure vessels, transport tanks, and nuclear components, and the inservice inspection of nuclear components and transport tanks. The Committee also interprets these rules when questions arise regarding their intent. The technical consistency of the Sections of the Code and coordination of standards development activities of the Committees is supported and guided by the Technical Oversight Management Committee. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks, or nuclear components, or the inservice inspection of nuclear components or transport tanks. Users of the Code should refer to the pertinent codes, standards, laws, regulations, or other relevant documents for safety issues other than those relating to pressure integrity. Except for Sections XI and XII, and with a few other exceptions, the rules do not, of practical necessity, reflect the likelihood and consequences of deterioration in service related to specific service fluids or external operating environments. In formulating the rules, the Committee considers the needs of users, manufacturers, and inspectors of pressure vessels. The objective of the rules is to afford reasonably certain protection of life and property, and to provide a margin for deterioration in service to give a reasonably long, safe period of usefulness. Advancements in design and materials and evidence of experience have been recognized.

This Code contains mandatory requirements, specific prohibitions, and nonmandatory guidance for construction activities and inservice inspection and testing activities. The Code does not address all aspects of these activities and those aspects that are not specifically addressed should not be considered prohibited. The Code is not a handbook and cannot replace education, experience, and the use of engineering judgment. The phrase *engineering judgment* refers to technical judgments made by knowledgeable engineers experienced in the application of the Code. Engineering judgments must be consistent with Code philosophy, and such judgments must never be used to overrule mandatory requirements or specific prohibitions of the Code.

The Committee recognizes that tools and techniques used for design and analysis change as technology progresses and expects engineers to use good judgment in the application of these tools. The designer is responsible for complying with Code rules and demonstrating compliance with Code equations when such equations are mandatory. The Code neither requires nor prohibits the use of computers for the design or analysis of components constructed to the

* The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI’s requirements for an ANS. Therefore, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Code.

** *Construction*, as used in this Foreword, is an all-inclusive term comprising materials, design, fabrication, examination, inspection, testing, certification, and overpressure protection.

requirements of the Code. However, designers and engineers using computer programs for design or analysis are cautioned that they are responsible for all technical assumptions inherent in the programs they use and the application of these programs to their design.

The rules established by the Committee are not to be interpreted as approving, recommending, or endorsing any proprietary or specific design, or as limiting in any way the manufacturer's freedom to choose any method of design or any form of construction that conforms to the Code rules.

The Committee meets regularly to consider revisions of the rules, new rules as dictated by technological development, Code Cases, and requests for interpretations. Only the Committee has the authority to provide official interpretations of this Code. Requests for revisions, new rules, Code Cases, or interpretations shall be addressed to the Secretary in writing and shall give full particulars in order to receive consideration and action (see Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees). Proposed revisions to the Code resulting from inquiries will be presented to the Committee for appropriate action. The action of the Committee becomes effective only after confirmation by ballot of the Committee and approval by ASME. Proposed revisions to the Code approved by the Committee are submitted to the American National Standards Institute (ANSI) and published at <http://go.asme.org/BPVCPublicReview> to invite comments from all interested persons. After public review and final approval by ASME, revisions are published at regular intervals in Editions of the Code.

The Committee does not rule on whether a component shall or shall not be constructed to the provisions of the Code. The scope of each Section has been established to identify the components and parameters considered by the Committee in formulating the Code rules.

Questions or issues regarding compliance of a specific component with the Code rules are to be directed to the ASME Certificate Holder (Manufacturer). Inquiries concerning the interpretation of the Code are to be directed to the Committee. ASME is to be notified should questions arise concerning improper use of the ASME Single Certification Mark.

When required by context in this Section, the singular shall be interpreted as the plural, and vice versa, and the feminine, masculine, or neuter gender shall be treated as such other gender as appropriate.

The words "shall," "should," and "may" are used in this Standard as follows:

- *Shall* is used to denote a requirement.
- *Should* is used to denote a recommendation.
- *May* is used to denote permission, neither a requirement nor a recommendation.

STATEMENT OF POLICY ON THE USE OF THE ASME SINGLE CERTIFICATION MARK AND CODE AUTHORIZATION IN ADVERTISING

ASME has established procedures to authorize qualified organizations to perform various activities in accordance with the requirements of the ASME Boiler and Pressure Vessel Code. It is the aim of the Society to provide recognition of organizations so authorized. An organization holding authorization to perform various activities in accordance with the requirements of the Code may state this capability in its advertising literature.

Organizations that are authorized to use the ASME Single Certification Mark for marking items or constructions that have been constructed and inspected in compliance with the ASME Boiler and Pressure Vessel Code are issued Certificates of Authorization. It is the aim of the Society to maintain the standing of the ASME Single Certification Mark for the benefit of the users, the enforcement jurisdictions, and the holders of the ASME Single Certification Mark who comply with all requirements.

Based on these objectives, the following policy has been established on the usage in advertising of facsimiles of the ASME Single Certification Mark, Certificates of Authorization, and reference to Code construction. The American Society of Mechanical Engineers does not “approve,” “certify,” “rate,” or “endorse” any item, construction, or activity and there shall be no statements or implications that might so indicate. An organization holding the ASME Single Certification Mark and/or a Certificate of Authorization may state in advertising literature that items, constructions, or activities “are built (produced or performed) or activities conducted in accordance with the requirements of the ASME Boiler and Pressure Vessel Code,” or “meet the requirements of the ASME Boiler and Pressure Vessel Code.” An ASME corporate logo shall not be used by any organization other than ASME.

The ASME Single Certification Mark shall be used only for stamping and nameplates as specifically provided in the Code. However, facsimiles may be used for the purpose of fostering the use of such construction. Such usage may be by an association or a society, or by a holder of the ASME Single Certification Mark who may also use the facsimile in advertising to show that clearly specified items will carry the ASME Single Certification Mark.

STATEMENT OF POLICY ON THE USE OF ASME MARKING TO IDENTIFY MANUFACTURED ITEMS

The ASME Boiler and Pressure Vessel Code provides rules for the construction of boilers, pressure vessels, and nuclear components. This includes requirements for materials, design, fabrication, examination, inspection, and stamping. Items constructed in accordance with all of the applicable rules of the Code are identified with the ASME Single Certification Mark described in the governing Section of the Code.

Markings such as “ASME,” “ASME Standard,” or any other marking including “ASME” or the ASME Single Certification Mark shall not be used on any item that is not constructed in accordance with all of the applicable requirements of the Code.

Items shall not be described on ASME Data Report Forms nor on similar forms referring to ASME that tend to imply that all Code requirements have been met when, in fact, they have not been. Data Report Forms covering items not fully complying with ASME requirements should not refer to ASME or they should clearly identify all exceptions to the ASME requirements.

PERSONNEL

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January 1, 2023

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W. Hoffelner	

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P. J. Coco	J. Cameron, <i>Alternate</i>
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P. Sakalaukus, Jr.	

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G. Grant	P.-S. Lam, <i>Alternate</i>
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R. C. Cipolla	S. Ranganath
C. M. Faigy	D. A. Scarth
M. M. Farooq	D. J. Shim
B. R. Ganta	A. Udyawar
T. J. Griesbach	T. V. Vo
K. Hasegawa	G. M. Wilkowski
K. Hojo	M. L. Benson, <i>Alternate</i>
D. N. Hopkins	H. S. Mehta, <i>Contributing Member</i>
D. R. Lee	

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K. Caver	D. E. Matthews
D. R. Cordes	P. J. O'Regan
P. Gionta	J. B. Ossmann
D. O. Henry	C. Thomas

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S. X. Xu, <i>Secretary</i>	S. A. Kleinsmith
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P. R. Donavin	G. M. Wilkowski
R. G. Gilada	H. S. Mehta, <i>Contributing Member</i>
T. J. Griesbach	T. Weaver, <i>Contributing Member</i>
M. Hayashi	

**Working Group on Flaw Evaluation
(SG-ES) (BPV XI)**

R. C. Cipolla, <i>Chair</i>	Y. S. Li
S. X. Xu, <i>Secretary</i>	C. Liu
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H. D. Chung	S. Noronha
N. G. Cofie	R. K. Qashu
M. A. Erickson	S. Ranganath
C. M. Faigy	D. A. Scarth
M. M. Farooq	W. L. Server
B. R. Ganta	D. J. Shim
R. G. Gilada	S. Smith
C. Guzman-Leong	M. Uddin
P. H. Hoang	A. Udyawar
K. Hojo	T. V. Vo
D. N. Hopkins	K. Wang
S. Kalyanam	B. Wasiluk
Y. Kim	G. M. Wilkowski
V. Lacroix	H. S. Mehta, <i>Contributing Member</i>
D. R. Lee	

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D. A. Scarth, <i>Chair</i>	Y. Kim
S. Kalyanam, <i>Secretary</i>	V. Lacroix
K. Azuma	Y. S. Li
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M. L. Benson	G. A. Miessi
M. Brumovsky	K. Miyazaki
F. W. Brust	S. M. Parker
H. D. Chung	S. H. Pellet
R. C. Cipolla	C. J. Sallaberry
N. G. Cofie	W. L. Server
C. M. Faigy	D. J. Shim
M. M. Farooq	S. Smith
B. R. Ganta	M. F. Uddin
R. G. Gilada	A. Udyawar
S. R. Gosselin	T. V. Vo
C. E. Guzman-Leong	K. Wang
K. Hasegawa	B. Wasiluk
P. H. Hoang	G. M. Wilkowski
K. Hojo	S. X. Xu
D. N. Hopkins	Y. Zou
E. J. Houston	K. Gresh, <i>Alternate</i>
R. Janowiak	H. S. Mehta, <i>Contributing Member</i>
K. Kashima	

**Working Group on Flaw Evaluation Reference Curves
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M. L. Benson	S. Ranganath
F. W. Brust	D. J. Shim
R. C. Cipolla	S. Smith
M. M. Farooq	M. Uddin
A. E. Freed	T. V. Vo
P. Gill	G. White
K. Hasegawa	S. X. Xu
K. Hojo	H. S. Mehta, <i>Contributing Member</i>

Task Group on Code Case N-513 (WG-PFE) (BPV XI)

R. O. McGill, <i>Chair</i>	E. J. Houston
S. M. Parker, <i>Secretary</i>	R. Janowiak
G. A. Antaki	S. H. Pellet
R. C. Cipolla	D. Rudland
M. M. Farooq	D. A. Scarth
K. Gresh	S. X. Xu

**Task Group on Evaluation Procedures for Degraded Buried Pipe
(WG-PFE) (BPV XI)**

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S. X. Xu, <i>Secretary</i>	M. Kassir
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G. A. Antaki	D. P. Munson
R. C. Cipolla	R. M. Pace
R. G. Gilada	S. H. Pellet
K. Hasegawa	D. Rudland
K. M. Hoffman	D. A. Scarth

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A. E. Freed, <i>Secretary</i>	R. M. Pace
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M. Brumovsky	S. Ranganath
M. A. Erickson	W. L. Server
T. J. Griesbach	C. A. Tomes
M. Hayashi	A. Udyawar
R. Janowiak	T. V. Vo
M. Kirk	H. Q. Xu
S. A. Kleinsmith	H. S. Mehta, <i>Contributing Member</i>
H. Kobayashi	

Task Group on Flaw Evaluation for HDPE Pipe (WG-PFE) (BPV XI)

S. Kalyanam, <i>Chair</i>	D. J. Shim
P. Krishnaswamy	M. Troughton
M. Moenssens	J. Wright
D. P. Munson	S. X. Xu
D. A. Scarth	

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M. A. Gray	D. J. Shim
T. J. Griesbach	S. Smith
H. Nam	A. Udyawar
A. Nana	T. V. Vo
A. D. Odell	

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T. Cinson, <i>Secretary</i>	J. Harrison
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C. Brown	C. Latiolais
A. Bushmire	F. J. Schaaf, Jr.
T. L. Chan	R. V. Swain
D. R. Cordes	C. A. Nove, <i>Alternate</i>

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T. Cinson	R. Tedder
S. E. Cumblidge	T. Thulien
A. Diaz	J. T. Timm
N. Farenbaugh	

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K. J. Hacker	J. Williams
R. E. Jacob	B. Lin, <i>Alternate</i>
W. A. Jensen	

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F. W. Brust	M. Orihuela
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R. Grantom	S. Takaya
K. Harris	R. Vayda

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M. T. Audrain	M. Orihuela
N. A. Finney	K. Yamada

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G. Beirnaert	J. Potgieter
C. Chen	

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K. Dozaki	A. T. Roberts III
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K. Harris	R. Vayda
M. Hayashi	D. Watanabe
S. Kalyanam	H. Yada
D. R. Lee	K. Yamada
H. Machida	T. Asayama, <i>Contributing Member</i>

Subgroup on Repair/Replacement Activities (SG-RRR) (BPV XI)

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R. Clow	R. R. Stevenson
S. J. Findlan	R. W. Swayne
M. L. Hall	D. J. Tilly
J. Honcharik	J. G. Weicks
A. B. Meichler	B. Lin, <i>Alternate</i>

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K. Harris	R. W. Swayne
B. Lin	

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R. Clow	T. Nuoffer
K. Dietrich	G. C. Park
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R. C. Folley	J. G. Weicks

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D. R. Dechene	R. Stakenborgs
M. Golliet	P. Vibien
J. Johnston, Jr.	M. P. Marohl, <i>Contributing Member</i>
B. Lin	

**Task Group on HDPE Piping for Low Safety Significance Systems
(WG-NMRRRA) (BPV XI)**

M. Brandes, <i>Chair</i>	T. M. Musto
J. E. O'Sullivan, <i>Secretary</i>	F. J. Schaaf, Jr.
M. Golliet	S. Schuessler
B. Lin	R. Stakenborghs

**Task Group on Repair by Carbon Fiber Composites
(WG-NMRRRA) (BPV XI)**

J. E. O'Sullivan, <i>Chair</i>	C. A. Nove
S. F. Arnold	R. P. Ojdrovic
S. W. Choi	A. Pridmore
D. R. Dechene	S. Rios
M. Golliet	C. W. Rowley
L. S. Gordon	J. Sealey
P. Krishnaswamy	R. Stakenborghs
M. Kuntz	N. Stoeva
H. Lu	M. F. Uddin
M. P. Marohl	J. Wen
L. Nadeau	B. Davenport, <i>Alternate</i>

**Working Group on Welding and Special Repair Processes
(SG-RRRA) (BPV XI)**

J. G. Weicks, <i>Chair</i>	D. Jacobs
G. T. Olson, <i>Secretary</i>	M. Kris
D. Barborak	S. E. Marlette
S. J. Findlan	S. L. McCracken
R. C. Folley	L. A. Melder
M. L. Hall	J. E. O'Sullivan
J. Honcharik	D. J. Tilly

Task Group on Temper Bead Welding (WG-W&SRP) (BPV XI)

S. J. Findlan, <i>Chair</i>	S. L. McCracken
D. Barborak	N. Mohr
R. C. Folley	G. T. Olson
J. Graham	J. E. O'Sullivan
M. L. Hall	A. Patel
D. Jacobs	J. Tatman
H. Kobayashi	J. G. Weicks

Task Group on Weld Overlay (WG-W&SRP)(BPV XI)

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S. Hunter, <i>Secretary</i>	S. E. Marlette
D. Barborak	G. T. Olson
S. J. Findlan	A. Patel
J. Graham	D. W. Sandusky
M. L. Hall	D. E. Waskey
D. Jacobs	J. G. Weicks

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J. Nygaard, <i>Secretary</i>	D. W. Lamond
J. M. Boughman	T. Nomura
S. T. Chesworth	T. Nuoffer
J. Collins	M. A. Pyne
H. Q. Do	H. M. Stephens, Jr.
K. W. Hall	R. Thames
P. J. Hennessey	M. Weis
A. E. Keyser	I. A. Anchondo-Lopez, <i>Alternate</i>

Task Group on High Strength Nickel Alloys Issues (SG-WCS) (BPV XI)

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C. Waskey, <i>Secretary</i>	S. E. Marlette
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T. Cinson	C. Wax
J. Collins	G. White
K. Dietrich	K. A. Whitney
P. R. Donavin	

Working Group on Containment (SG-WCS) (BPV XI)

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H. T. Hill	P. C. Smith
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A. E. Keyser	M. Weis
B. Lehman	S. G. Brown, <i>Alternate</i>

**Working Group on Inspection of Systems and Components
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M. Weis, <i>Secretary</i>	A. Keller
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R. W. Blyde	E. Lantz
K. Caver	A. Maekawa
C. Cueto-Felgueroso	T. Nomura
M. J. Ferlisi	J. C. Nygaard
M. L. Garcia Heras	S. Orita
K. W. Hall	A. W. Wilkens

Working Group on Pressure Testing (SG-WCS) (BPV XI)

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T. Anselmi	R. A. Nettles
M. J. Homiack	C. Thomas
A. E. Keyser	K. Whitney

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C. Cueto-Felgueroso	E. Lantz
R. Haessler	P. J. O'Regan
J. Hakii	N. A. Palm
K. W. Hall	D. Vetter

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T. L. Chan	D. Vetter
P. J. Hennessey	S. E. Woolf
K. A. Kavanagh	B. Harris, <i>Alternate</i>
G. Ramaraj	R. S. Spencer, <i>Alternate</i>

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CORRESPONDENCE WITH THE COMMITTEE

(23)

General

ASME codes and standards are developed and maintained by committees with the intent to represent the consensus of concerned interests. Users of ASME codes and standards may correspond with the committees to propose revisions or cases, report errata, or request interpretations. Correspondence for this Section of the ASME Boiler and Pressure Vessel Code (BPVC) should be sent to the staff secretary noted on the Section's committee web page, accessible at <https://go.asme.org/CSCcommittees>.

NOTE: See ASME BPVC Section II, Part D for guidelines on requesting approval of new materials. See Section II, Part C for guidelines on requesting approval of new welding and brazing materials ("consumables").

Revisions and Errata

The committee processes revisions to this Code on a continuous basis to incorporate changes that appear necessary or desirable as demonstrated by the experience gained from the application of the Code. Approved revisions will be published in the next edition of the Code.

In addition, the committee may post errata and Special Notices at <http://go.asme.org/BPVCerrata>. Errata and Special Notices become effective on the date posted. Users can register on the committee web page to receive e-mail notifications of posted errata and Special Notices.

This Code is always open for comment, and the committee welcomes proposals for revisions. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent background information and supporting documentation.

Cases

(a) The most common applications for cases are

(1) to permit early implementation of a revision based on an urgent need

(2) to provide alternative requirements

(3) to allow users to gain experience with alternative or potential additional requirements prior to incorporation directly into the Code

(4) to permit use of a new material or process

(b) Users are cautioned that not all jurisdictions or owners automatically accept cases. Cases are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Code.

(c) The committee will consider proposed cases concerning the following topics only:

(1) equipment to be marked with the ASME Single Certification Mark, or

(2) equipment to be constructed as a repair/replacement activity under the requirements of Section XI

(d) A proposed case shall be written as a question and reply in the same format as existing cases. The proposal shall also include the following information:

(1) a statement of need and background information

(2) the urgency of the case (e.g., the case concerns a project that is underway or imminent)

(3) the Code Section and the paragraph, figure, or table number(s) to which the proposed case applies

(4) the edition(s) of the Code to which the proposed case applies

(e) A case is effective for use when the public review process has been completed and it is approved by the cognizant supervisory board. Cases that have been approved will appear in the next edition or supplement of the Code Cases books, "Boilers and Pressure Vessels" or "Nuclear Components." Each Code Cases book is updated with seven Supplements. Supplements will be sent or made available automatically to the purchasers of the Code Cases books until the next edition of the Code. Annulments of Code Cases become effective six months after the first announcement of the annulment in a Code Case Supplement or Edition of the appropriate Code Case book. The status of any case is available at <http://go.asme.org/BPVCCDatabase>. An index of the complete list of Boiler and Pressure Vessel Code Cases and Nuclear Code Cases is available at <http://go.asme.org/BPVCC>.

Interpretations

(a) Interpretations clarify existing Code requirements and are written as a question and reply. Interpretations do not introduce new requirements. If a revision to resolve conflicting or incorrect wording is required to support the interpretation, the committee will issue an intent interpretation in parallel with a revision to the Code.

(b) Upon request, the committee will render an interpretation of any requirement of the Code. An interpretation can be rendered only in response to a request submitted through the online Interpretation Submittal Form at <http://go.asme.org/InterpretationRequest>. Upon submitting the form, the inquirer will receive an automatic e-mail confirming receipt.

(c) ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Code requirements. If, based on the information submitted, it is the opinion of the committee that the inquirer should seek assistance, the request will be returned with the recommendation that such assistance be obtained. Inquirers may track the status of their requests at <http://go.asme.org/Interpretations>.

(d) ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. ASME does not “approve,” “certify,” “rate,” or “endorse” any item, construction, proprietary device, or activity.

(e) Interpretations are published in the ASME Interpretations Database at <http://go.asme.org/Interpretations> as they are issued.

Committee Meetings

The ASME BPVC committees regularly hold meetings that are open to the public. Persons wishing to attend any meeting should contact the secretary of the applicable committee. Information on future committee meetings can be found at <http://go.asme.org/BCW>.

SUMMARY OF CHANGES

Changes listed below are identified on the pages by a margin note, **(23)**, placed next to the affected area.

<i>Page</i>	<i>Location</i>	<i>Change</i>
xiii	List of Sections	(1) Under Section III, Division 4 added (2) Title of Section XI and subtitle of Section XI, Division 2 revised (3) Information on interpretations and Code cases moved to "Correspondence With the Committee"
xvii	Personnel	Updated
xxxix	Correspondence With the Committee	Added (replaces "Submittal of Technical Inquiries to the Boiler and Pressure Vessel Standards Committees")
xlvi	Cross-Referencing in the ASME BPVC	Updated
8-11	Table 1A	Lines 5 and 30 deleted
12-15	Table 1A	Lines 24, 28, and 34 corrected by errata
16-19	Table 1A	Lines 29 and 37 revised
24-27	Table 1A	Line 43 revised
28-31	Table 1A	Line 14 corrected by errata
36-39	Table 1A	Line 25 revised
56-59	Table 1A	Line 4 added
72-75	Table 1A	Lines 26-35, 37-42, and 44 revised
76-79	Table 1A	Lines 1 and 2 revised
88-91	Table 1A	Lines 38 and 39 revised
92-95	Table 1A	Lines 36 and 37 revised
116-119	Table 1A	Lines 24-29 revised and relocated
124-127	Table 1A	Line 31 corrected by errata
128-131	Table 1A	Lines 19 and 20 added
148-151	Table 1A	Lines 19-22 added
156-159	Table 1A	Lines 10 and 11 added
172-175	Table 1B	Lines 42 and 43 revised
184-187	Table 1B	Lines 30-33 revised
188-191	Table 1B	(1) Lines 26, 38, and 39 revised (2) Lines 36 and 37 deleted
192-195	Table 1B	(1) Lines 4-7 revised (2) Lines 43 and 45 added
196-199	Table 1B	(1) Line 2 added (2) Lines 3 and 19-22 revised
200-203	Table 1B	(1) Lines 21, 22, 25, and 26 deleted (2) Lines 23, 27, 43, and 45 revised

<i>Page</i>	<i>Location</i>	<i>Change</i>
		(3) Lines 24, 28, 30, 32, 34, 36, 38, 41, and 44 added
204–207	Table 1B	(1) Lines 1 and 3 added (2) Lines 29, 30, and 41 revised
208–211	Table 1B	(1) Lines 26, 27, 40, and 44 revised (2) Line 45 added
212–215	Table 1B	(1) Lines 1, 3, 5, 31, and 32 revised (2) Lines 2, 4, and 6 added
216–219	Table 1B	(1) Lines 18, 19, 24, 26, 34, and 35 revised (2) Lines 24 and 26 corrected by errata
220–223	Table 1B	(1) Lines 5, 18, and 32 revised (2) Lines 12, 19, 21, and 22 corrected by errata (3) Line 23 added by errata
224–227	Table 1B	Lines 9 and 24–42 revised
236–239	Table 1B	Line 22 revised
240–243	Table 1B	(1) Lines 13 and 14 added (2) Line 19 corrected by errata (3) Line 25 revised
248–251	Table 1B	Lines 3–11 corrected by errata
256–259	Table 1B	Lines 8 and 26 revised
260–263	Table 1B	Lines 26 and 40 revised
264–267	Table 1B	Lines 1 and 43 revised
272–275	Table 1B	Line 2 revised
284–287	Table 1B	Lines 26–34 revised
288–291	Table 1B	(1) Lines 21–24, 26, and 29–31 revised (2) Lines 25 and 32 added (3) Lines 27 and 28 deleted by errata
292	Table 1B	Note G17 revised
296–298	Table 2A	Line 8 deleted
300–302	Table 2A	Lines 27–30 added
304–306	Table 2A	(1) Lines 22–29, 44, and 45 added (2) Line 30 revised
308–310	Table 2A	(1) Line 8 added (2) Line 11 revised
312–314	Table 2A	(1) Line 13 revised (2) Lines 24–33 added
316–318	Table 2A	Lines 6–8, 17, 26–32, and 41 added
324–326	Table 2A	(1) Lines 7 and 21 added (2) Lines 38–40 revised
328–330	Table 2A	(1) Line 6 revised (2) Lines 29 and 32–34 added
336–338	Table 2A	(1) Line 25 revised (2) Line 26 added

<i>Page</i>	<i>Location</i>	<i>Change</i>
344–346	Table 2A	Lines 3, 4, 41, and 42 added
348–350	Table 2A	(1) Line 35 revised (2) Line 39 added
352–354	Table 2A	(1) Line 9 revised (2) Line 43 added
356–358	Table 2A	Lines 41 and 42 added
368–370	Table 2A	(1) Line 3 added (2) Line 45 revised and relocated
372–374	Table 2A	(1) Lines 1–3 revised and relocated (2) Lines 31–36 added
376–378	Table 2A	Lines 43–45 added
380–382	Table 2A	Lines 1, 36, 44, and 45 added
384–386	Table 2A	Lines 1–5 added
390–416	Table 2B	“Type/Grade” column added
394–396	Table 2B	(1) Lines 18, 19, 31, and 32 deleted (2) Lines 20–23, 33–42, 44, and 45 added (3) Lines 24 and 43 revised
398–400	Table 2B	(1) Lines 1–5 added (2) Lines 26 and 35 revised (3) Line 33 corrected by errata
402–404	Table 2B	Lines 5, 11, and 13 corrected by errata
406–408	Table 2B	Lines 23 and 25 corrected by errata
410–412	Table 2B	Lines 42–45 revised
414–416	Table 2B	Lines 1–41 revised
417	Table 2B	Note E5 added
422–425	Table 3	(1) Lines 18, 19, 24, 25, 37, 40, and 43 revised (2) Lines 18 and 19 transposed (3) Lines 24 and 25 transposed
434–437	Table 3	(1) Lines 9, 10, and 34–39 revised (2) Lines 29 and 32 corrected by errata
438–441	Table 3	(1) Lines 9–14 corrected by errata (2) Line 43 revised
447	Table 3	Note T13 added
456–458	Table 4	Lines 1–8 corrected by errata
460–463	Table 5A	(1) Line 5 deleted (2) Line 38 revised
464–467	Table 5A	Lines 16, 20, 29, 35, 36, 41, and 42 revised
480–483	Table 5A	Lines 24 and 40 revised
496–499	Table 5A	Lines 14 and 26 revised
504–507	Table 5A	Lines 17, 39, and 40 revised
508–511	Table 5A	Line 1 revised and relocated

<i>Page</i>	<i>Location</i>	<i>Change</i>
522–545	Table 5B	“Type/Grade” column added
526–529	Table 5B	(1) Lines 36, 37, and 39–42 added (2) Line 38 revised
538–541	Table 5B	Lines 33–45 revised
542–545	Table 5B	Lines 1–27 revised
550, 551	Table 6A	(1) Line 31 added (2) Line 34 deleted
552, 553	Table 6A	(1) Lines 8, 10, and 11 added (2) Lines 9 and 30–39 revised
558, 559	Table 6B	(1) Lines 19–21 revised (2) Lines 22 and 37 added
560, 561	Table 6B	(1) Lines 4 and 25 added (2) Lines 24 and 43–45 revised
562, 563	Table 6B	(1) Lines 1–3 and 13 revised (2) Lines 4–9 and 17–20 added
578–580	Table U	Lines 5 and 23 deleted
582–584	Table U	Line 13 corrected by errata
618–620	Table U	Lines 33 and 34 corrected by errata
626–628	Table U	Lines 24 and 26 revised
630–632	Table U	Line 4 added
650–652	Table U	Lines 8, 11, and 16 revised
654–656	Table U	(1) Lines 13 and 15 added (2) Line 14 revised
658–660	Table U	Lines 5 and 35 revised
674–676	Table U	Lines 23–26 revised and relocated
678–680	Table U	Line 34 added
690–692	Table U	Line 45 added
694–696	Table U	Lines 1, 42, and 43 added
722–724	Table U	(1) Line 6 added (2) Lines 7, 8, and 42 revised
730–732	Table U	Lines 14 and 15 added
734–736	Table U	Lines 29–34 revised
738–740	Table U	(1) Lines 27–30 and 41 revised (2) Line 42 added
742–744	Table U	(1) Line 8 corrected by errata (2) Lines 11 and 12 revised (3) Line 13 added
754–756	Table U	(1) Lines 13, 15, and 17–22 revised (2) Lines 14, 16, and 45 added by errata (3) Lines 23–27 and 39–41 corrected by errata (4) Line 38 added

<i>Page</i>	<i>Location</i>	<i>Change</i>
766–768	Table U	Lines 24, 26, 28, 30, 32, and 34 deleted
770–772	Table U	Lines 2 and 4 revised
786–788	Table U	Lines 5–11 added
790–794	Table Y-1	Lines 5 and 23 deleted
796–800	Table Y-1	Lines 15, 19, and 25 corrected by errata
856–860	Table Y-1	Line 22 corrected by errata
868–872	Table Y-1	Line 40 added
880–884	Table Y-1	Lines 20–22 and 25 deleted
904–908	Table Y-1	Lines 10, 14, and 19 revised
910–914	Table Y-1	(1) Lines 17 and 19 added (2) Line 18 revised
916–920	Table Y-1	Lines 9 and 39 revised
946–950	Table Y-1	Lines 1–4 revised and relocated
952–956	Table Y-1	Line 14 added
970–974	Table Y-1	Lines 25 and 26 added
976–980	Table Y-1	Lines 22 and 23 added
1006–1010	Table Y-1	(1) Line 24 added (2) Lines 25 and 26 revised
1012–1016	Table Y-1	Line 15 revised
1018–1022	Table Y-1	Lines 27 and 28 added
1030–1034	Table Y-1	Lines 8–10 revised
1036–1040	Table Y-1	(1) Lines 3–6 revised (2) Lines 17, 18, and 32–34 added
1054–1058	Table Y-1	Line 39 added by errata
1060–1064	Table Y-1	(1) Lines 5, 19, 26, 28, and 31 corrected by errata (2) Line 18 added (3) Lines 20 and 27 added by errata (4) Lines 29–33 revised
1078–1082	Table Y-1	(1) Lines 9, 11, 13, 15, 17, and 19 deleted (2) Lines 29 and 34 revised
1108–1112	Table Y-1	Lines 1–7 added
1114	Table Y-2	Title revised
1115	Subpart 2, Introduction	Fifth paragraph added
1116	Table TE-1	Note (2) revised
1134	Table TCD	Notes (11) and (12) revised
1148	Table TM-1	Notes (6) and (8) revised
1152	Table TM-3	Revised
1302	Table 5-800	Corrected by errata
1332	A-702.1.6	Added

CROSS-REFERENCING IN THE ASME BPVC

Paragraphs within the ASME BPVC may include subparagraph breakdowns, i.e., nested lists. The following is a guide to the designation and cross-referencing of subparagraph breakdowns:

(a) Hierarchy of Subparagraph Breakdowns

- (1) First-level breakdowns are designated as (a), (b), (c), etc.
- (2) Second-level breakdowns are designated as (1), (2), (3), etc.
- (3) Third-level breakdowns are designated as (-a), (-b), (-c), etc.
- (4) Fourth-level breakdowns are designated as (-1), (-2), (-3), etc.
- (5) Fifth-level breakdowns are designated as (+a), (+b), (+c), etc.
- (6) Sixth-level breakdowns are designated as (+1), (+2), etc.

(b) Cross-References to Subparagraph Breakdowns. Cross-references within an alphanumerically designated paragraph (e.g., PG-1, UIG-56.1, NCD-3223) do not include the alphanumerical designator of that paragraph. The cross-references to subparagraph breakdowns follow the hierarchy of the designators under which the breakdown appears. The following examples show the format:

- (1) If X.1(c)(1)(-a) is referenced in X.1(c)(1), it will be referenced as (-a).
- (2) If X.1(c)(1)(-a) is referenced in X.1(c)(2), it will be referenced as (1)(-a).
- (3) If X.1(c)(1)(-a) is referenced in X.1(e)(1), it will be referenced as (c)(1)(-a).
- (4) If X.1(c)(1)(-a) is referenced in X.2(c)(2), it will be referenced as X.1(c)(1)(-a).

SUBPART 1

STRESS TABLES

STATEMENT OF POLICY ON INFORMATION PROVIDED IN THE STRESS TABLES

The purpose of this Statement of Policy is to clarify which information in the stress tables is mandatory and which is not. The information and restrictions provided in the Notes found throughout the various stress tables provided in Section II, Part D, [Subpart 1](#), are mandatory. It is vital to recognize that lines of information in Tables 1A, 1B, 2A, 2B, 3, 4, 5A, 5B, 6A, 6B, 6C, and 6D frequently have essential information referenced in the Notes column. These Notes are organized as follows:

- (a) EXX: defining onset of values based on successful experience in service
- (b) GXX: general requirements
- (c) HXX: heat treatment requirements
- (d) SXX: size requirements
- (e) TXX: defining onset of time-dependent behavior
- (f) WXX: welding requirements

The specifications and grades or types, coupled with the assigned Notes for each line, provide the complete description of material in the context of the allowable stresses or design stress intensities. Additional requirements for particular types of construction must also be obtained from the rules governing the construction.

In Tables 1A, 2A, 5A, 6A, 6C, and 6D, the information in the Nominal Composition column is nonmandatory and is for information only. However, these nominal compositions are the primary sorting used in these six tables. See the Guideline on Locating Materials in Stress Tables, and in Tables of Mechanical and Physical Properties. The information in the Alloy Designation/UNS Number column is nonmandatory for specifications for which a grade or type is provided. This is primarily true for the non-stainless steel alloys in these tables. For specifications for which no type or grade is listed, the UNS number is mandatory. Particularly for the stainless steels, for which no type or grade is listed, the UNS number is the grade.

The only difference between Tables 1A, 2A, 5A, 6A, 6C, and 6D and Tables 1B, 2B, 5B, and 6B, with regard to the mandatory/nonmandatory nature of the information, is

that in Tables 1B, 2B, 5B, and 6B, the UNS number information is used as the basis of the sorting scheme for materials and is almost always mandatory.

Where provided, the information in the columns for Product Form, Specification Number, Type/Grade, Class/Condition/Temper, and External Pressure Chart Number is mandatory. The information in the P-Number and Group Number columns is also mandatory; however, the primary source for this information is Table QW/QB-422 in Section IX. When there is a conflict between the P-number and Group number information in these stress tables and that in Section IX, the numbers in Section IX shall govern.

The information in the Minimum Tensile Strength, Minimum Yield Strength, and Size/Thickness dimension columns is also mandatory; however, the primary source for this information is the material specifications in Section II, Parts A and B. These values are a primary basis for establishing the allowable stresses and design stress intensities. When there is a conflict between the tensile and yield strength values in the stress tables and those in the material specifications in Section II, Parts A and B, the minimum tensile and yield strength values in Parts A and B shall govern. For dual-unit specifications and for product forms for which separate U.S. Customary and Metric specifications are provided, for the Size/Thickness dimensions for size breaks at which the Minimum Specified Yield or Tensile Strengths, or both, decrease with increasing size or thickness, the values in the material specifications in Parts A and B shall govern. When there is a conflict between the maximum size or thickness values in the stress tables and those in the material specifications, the values in the stress tables shall govern.

The information in the Applicability and Maximum Temperature Limits columns is mandatory. Where a material is permitted for use in more than one Construction Code, and in the SI units version of these tables, the maximum use temperature limit in these columns is critical. The temperature to which allowable stress or design stress intensity values are listed is not necessarily the

temperature to which use is permitted by a particular Construction Code. Different Construction Codes often have different use temperature limits for the same material and condition. Further, values may be listed in the stress tables at temperatures above the maximum use temperature limit. These stress values are provided to

permit interpolation to be used to determine the allowable stress or design stress intensity at temperatures between the next lowest temperature for which stress values are listed and the maximum-use temperature limit listed in these columns.

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GUIDELINE ON LOCATING MATERIALS IN STRESS TABLES, AND IN TABLES OF MECHANICAL AND PHYSICAL PROPERTIES

1 INTRODUCTION

The goal of this Guideline is to assist the users of Section II, Part D in locating materials in stress tables (Tables 1A, 1B, 2A, 2B, 3, 4, 5A, 5B, 6A, 6B, 6C, and 6D), tables of mechanical properties (Tables U and Y-1), and tables of physical properties (Tables TE-1 through TE-5, TCD, TM-1 through TM-5, and PRD). This Guideline defines the logic used to place materials within these tables.

2 STRESS TABLES

Stress tables are all found within Section II, Part D, Subpart 1. Tables 1A, 1B, 3, 5A, 5B, 6A, 6B, 6C, and 6D cover allowable stresses, while Tables 2A, 2B, and 4 cover design stress intensities. The governing allowable stresses for those materials are provided in ASME BPVC, Section IV. Although Subpart 1 also covers ultimate tensile strength and yield strength, the organization of those mechanical property tables will be discussed separately in para. 3. A table-by-table listing of the materials-organization logic used to place materials within the designated tables follows.

2.1 TABLE 1A

Table 1A provides allowable stresses for ferrous¹ materials used in Section I; Section III, Division 1, Classes 2 and 3; Section VIII, Division 1; and Section XII construction. Within Table 1A, the first step in ordering materials is to use their nominal compositions. These nominal compositions are nothing more than accepted compositional fingerprints or widely recognized designators for each alloy or alloy class. These nominal compositions are arranged in Table 1A as follows:

- (a) carbon steels
- (b) carbon steels with small additions of Cb, Ti, and V (microalloyed steels)
- (c) C- $\frac{1}{2}$ Mo steels
- (d) chromium steels, including ferritic stainless steels, by increasing Cr content [$\frac{1}{2}$ Cr, $\frac{3}{4}$ Cr, 1Cr, $1\frac{1}{4}$ Cr, $2\frac{1}{4}$ Cr, 3Cr, 5Cr, 9Cr, 11Cr, 12Cr, 13Cr, 15Cr, 17Cr (including 17Cr-4Ni-4Cu and 17Cr-4Ni-6Mn), 18Cr, 26Cr, 27Cr, and 29Cr]
- (e) manganese steels (Mn- $\frac{1}{4}$ Mo, Mn- $\frac{1}{2}$ Mo, Mn- $\frac{1}{2}$ Ni, and Mn-V)
- (f) silicon steel ($1\frac{1}{2}$ Si- $\frac{1}{2}$ Mo)
- (g) nickel steels ($\frac{1}{2}$ Ni, $\frac{3}{4}$ Ni, 1Ni, $1\frac{1}{4}$ Ni, 2Ni, $2\frac{1}{2}$ Ni, $2\frac{3}{4}$ Ni, 3Ni, $3\frac{1}{2}$ Ni, 4Ni, 5Ni, 8Ni, and 9Ni)

(h) other high nickel steels [25Ni-15Cr-2Ti (Grade 660) and 29Ni-20Cr-3Cu-2Mo (CN7M)]

(i) high alloy steels, including the duplex stainless steels, in order of increasing chromium content [beginning with 14Cr-16Ni-6Si-Cu-Mo, then 16Cr-9Mn-2Ni-N, then 16Cr-12Ni-2Mo (316L), etc.], then by increasing nickel content within a given chromium or other alloy content [18Cr-8Ni, 18Cr-8Ni-N, 18Cr-8Ni-4Si-N, 18Cr-10Ni-Cb (first S34700, then S34709, S34800, and S34809), 18Cr-10Ni-Ti, 18Cr-11Ni, etc., ending with 29Cr-6.5Ni-2Mo-N]

Unfortunately, most specifications for materials do not give nominal compositions — and without that information, one may not know the nominal composition for a particular material in Table 1A. If the specification number and alloy grade or type designation are known, then one can go to Section IX, Table QW/QB-422 and find the corresponding nominal composition.

Now, for a given nominal composition, Table 1A is arranged by increasing strength — first tensile strength and then yield strength. For a given nominal composition, tensile strength, and yield strength, stress listings are provided in order of increasing specification number. Sometimes, for a given nominal composition, tensile strength, yield strength, and specification number/grade or type, there may be more than one line of stresses. At this point, the Notes referenced on the second page of each page set within Table 1A will define why there are two or more lines of stresses and when each applies.

2.2 TABLE 1B

Table 1B provides allowable stresses for nonferrous materials used in Section I; Section III, Division 1, Classes 2 and 3; Section VIII, Division 1; and Section XII construction. Aluminum alloys (UNS AXXXXX materials) are the first materials covered in Table 1B, followed by copper alloys (UNS CXXXXX), nickel alloys (UNS NXXXXX), and the reactive and refractory metals and alloys (UNS RXXXXX). Within this latter category there are the following:

- (a) chromium alloys (R2XXXX)
- (b) cobalt alloys (R3XXXX)
- (c) titanium alloys (R5XXXX)
- (d) zirconium alloys (R6XXXX)

Within each of these material class groupings, stress lines are first organized by increasing UNS (Unified Numbering System) number. The nonferrous specifications now show these numbers in association with grade designations. Then, for a given UNS number, stress lines are

next ordered by strength — first tensile strength and then yield strength. Finally, for a given UNS number, tensile strength, and yield strength, stress lines are ordered by increasing specification number. Again, some materials may have two or more stress lines even if their UNS number, tensile strength, yield strength, and specification number are the same. The Notes provide direction for the applicability of each line.

For those material specifications that may not show UNS numbers associated with alloy grades, one again can refer to Section IX, Table QW/QB-422 for that information.

For Table 1B, nominal compositions are shown only for the NXXXXX and RXXXXX materials, but they have no influence on the location of alloys in the table. In this Table, the nominal compositions are simply for information.

2.3 TABLE 2A

Table 2A provides design stress intensities for ferrous materials for Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5 construction; and allowable stresses for ferrous materials for Section VIII, Division 2, Class 1 construction. This Table is organized in the same manner as Table 1A. Refer back to para. 2.1 for that description.

2.4 TABLE 2B

Table 2B provides design stress intensities for nonferrous materials for Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5 construction; and allowable stresses for nonferrous materials for Section VIII, Division 2, Class 1 construction. Table 2B materials are ordered in the same manner as in Table 1B. Refer back to para. 2.2 for that description.

2.5 TABLE 3

Table 3 provides allowable stresses for bolting materials for use in Section III, Division 1, Classes 2 and 3; Section VIII, Division 1; Section VIII, Division 2 (using Section VIII, Division 2, Part 4.16); and Section XII construction. The table first covers ferrous materials and then nonferrous materials. For the ferrous materials, the ordering logic parallels that used in Tables 1A and 2A — first by nominal composition, then by increasing ultimate tensile strength, then by increasing yield strength, and finally by increasing specification number. Again, refer back to para. 2.1 for a discussion on nominal composition.

Nonferrous materials are presented using the same logic as in Tables 1B and 2B; see para. 2.2 for that discussion.

2.6 TABLE 4

Table 4 provides design stress intensities for bolting materials used in Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5;

and allowable stresses for bolting materials used in Section VIII, Division 2 (using Section VIII, Division 2, Part 5 and Annex 5.F).

Table 4 is organized in the same manner as Table 3 — first covering ferrous materials and then nonferrous materials — except that Table 4 covers far fewer materials. For the ordering logic, again refer to paras. 2.1 and 2.2 for ferrous and nonferrous materials, respectively.

2.7 TABLE 5A

Table 5A provides allowable stresses for ferrous materials for Section VIII, Division 2, Class 2 construction. This Table is organized in the same manner as Table 1A. Refer back to para. 2.1 for that description.

2.8 TABLE 5B

Table 5B provides allowable stresses for nonferrous materials for Section VIII, Division 2, Class 2 construction. This Table is organized in the same manner as Table 1B. Refer back to para. 2.2 for that description.

2.9 TABLE 6A

Table 6A provides allowable stresses for ferrous materials for Section IV construction. This Table is organized in the same manner as Table 1A. Refer back to para. 2.1 for that description.

2.10 TABLE 6B

Table 6B provides allowable stresses for nonferrous materials for Section IV construction. This Table is organized in the same manner as Table 1B. Refer back to para. 2.2 for that description.

2.11 TABLE 6C

Table 6C provides allowable stresses for Section IV construction of lined water heaters. This Table is organized in the same manner as Table 1A. Refer back to para. 2.1 for that description.

2.12 TABLE 6D

Table 6D provides allowable stresses for Section IV construction of unlined water heaters. This Table is organized in the same manner as Table 1A. Refer back to para. 2.1 for that description.

3 MECHANICAL PROPERTY TABLES

Ultimate tensile strength values and yield strength values are to be used in design calculations according to the rules of the Construction Codes. However, they are not to be construed as minimum strength values at temperature. This is explained in the General Notes to these tables. Paragraphs 3.1 through 3.3 provide a table-by-table listing of the materials-organization logic.

Tensile (Table U) and yield (Table Y-1) strengths at elevated temperatures are based on trend curves determined by statistical curve fitting of submitted mechanical property data. Wrought materials and cast materials are considered different materials. A material has only one trend curve for tensile strengths and one trend curve for yield strengths. Each curve is anchored to the minimum value at room temperature in its set of units. See Nonmandatory Appendix D for more information.

3.1 TABLE U

Table U provides tensile strength values for ferrous and nonferrous materials, in that order. The ordering logic for ferrous materials is the same as used in Table 1A, except yield strength level is not shown. Using the logic described in para. 2.1, stress lines are organized by nominal composition, then by increasing tensile strength level, and then by increasing specification number.

Nonferrous materials coverage begins following the last of the high alloy steels (25Cr-22Ni-2Mo-N). Coverage of nonferrous alloys begins with the UNS AXXXXX alloys, followed by NXXXXX and RXXXXX alloys. The ordering of materials within these three groups has been previously described in para. 2.2.

3.3 TABLE Y-1

Table Y-1 provides yield strength values for ferrous and nonferrous materials, in that order. Again, the ordering of yield strength lines parallels the logic described for ferrous and nonferrous materials in paras. 2.1 and 2.2, respectively. Unlike Table U, for ferrous materials, the tensile strength level does enter into the ordering process, again following nominal composition designation. Table Y-1's nonferrous materials listings begin with the aluminum-base alloys (UNS AXXXXX). These are followed by the copper materials (CXXXXX), nickel-base materials (NXXXXX), and the reactive and refractory metals and alloys (RXXXXX).

4 PHYSICAL PROPERTY TABLES

Since physical properties (thermal conductivity, thermal diffusivity, thermal expansion, and density), Young's modulus, and Poisson's ratio values can be shown for numerous materials with a single set of property values, most of the tables found in Section II, Part D, Subpart 2 are based on nominal composition. Paragraphs 4.1 through 4.4 describe how these tables are organized.

4.1 TABLE TE

Table TE covers thermal expansion behavior, presented in terms of A (instantaneous coefficient of thermal expansion), B (mean coefficient of thermal expansion), and C (linear thermal expansion). This Table is split into five parts as follows:

(a) Table TE-1 covers numerous individual ferrous materials and ferrous material groupings. Notes at the end of Table TE-1 list the nominal compositions covered by the designated groupings. Again, knowledge of the nominal composition for a given material is essential, and it was noted previously that these can be extracted from Section IX, Table QW/QB-422, given the specification number and grade or type designation.

(b) Table TE-2 covers aluminum alloys. One set of A/B/C values covers all of the aluminum-base materials listed in General Note (a) of Table TE-2.

(c) Table TE-3 covers copper alloys, currently in five general groupings: C1XXXX alloys, bronze alloys, brass alloys, 70Cu-30Ni, and 90Cu-10Ni. According to an article in ASM International's "Advanced Materials & Processes" (December 1999), the general terms of bronze and brass cover the following alloys:

(1) wrought copper-base alloys

(-a) C20500-C28580 — brasses (Cu-Zn)

(-b) C31200-C38590 — leaded brasses (Cu-Zn-Pb)

(-c) C40400-C49080 — tin brasses (Cu-Zn-Sn-Pb)

(-d) C60600-C64400 — aluminum bronzes (Cu-Al-Ni-Fe-Si-Sn)

(-e) C64700-C66100 — silicon bronzes (Cu-Si-Sn)

(2) cast copper-base alloys

(-a) C83300-C85800 — red and leaded red brasses (Cu-Zn-Sn-Pb)

(-b) C86100-C86800 — manganese bronzes and leaded manganese bronzes (Cu-Zn-Mn-Fe-Pb)

(-c) C90200-C94500 — tin bronzes and leaded tin bronzes (Cu-Sn-Zn-Pb)

(-d) C95300-C95810 — aluminum bronzes (Cu-Al-Fe-Ni)

This guidance should help define which group of A/B/C values of thermal expansion to select for a given brass or bronze.

(d) Table TE-4 provides thermal expansion values for nickel alloys and refractory alloys. The thermal expansion value sets for the nickel alloys are arranged by increasing UNS NXXXXX numbers.

(e) Table TE-5 provides thermal expansion values for two groupings of titanium-base alloys. One group covers only Grade 9; the other group covers the other alloys. In this Table, there is no reference to the UNS number, just to the grade number.

4.2 TABLE TCD

Table TCD provides both thermal conductivity (TC) and thermal diffusivity (TD) values for numerous ferrous and nonferrous materials and material groupings. The table begins with ferrous materials, split into groups of carbon and low alloy steels, followed by groups of high chromium steels and groups of high alloy steels. For each

of these groups, there is a listing of nominal composition designations found at the end of the table, defining the extent of coverage.

The next series of materials are the nickel-base alloys, covered by TC/TD listings for nickel alloys (arranged by increasing UNS number) and refractory alloys. Then there are TC/TD listings for individual titanium and aluminum alloys (arranged by increasing UNS number). [Table TCD](#) does not currently provide values for copper or zirconium alloys.

4.3 TABLE TM

Table TM provides moduli of elasticity for five categories of materials, as follows:

(a) [Table TM-1](#) covers ferrous materials in nine general categories and with additional lines for specific materials. Groups A through G are subdivided by nominal composition; see the Notes at the end of [Table TM-1](#).

(b) [Table TM-2](#) covers aluminum alloys, listed by UNS number designation.

(c) [Table TM-3](#) covers copper alloys, listed by UNS number designation.

(d) [Table TM-4](#) covers nickel alloys, listed by UNS number designation.

(e) [Table TM-5](#) covers titanium alloys, listed by increasing grade numbers, and zirconium-base alloys, listed by increasing UNS number (or grade) designation.

4.4 TABLE PRD

[Table PRD](#) provides Poisson's ratio and density for ferrous and nonferrous materials.

5 REFERENCES

The official reference for UNS numbers is *Metals & Alloys in the Unified Numbering System*, ASTM DS-56. This document is periodically updated as various material specifications are revised, added, or deleted by their sponsoring organizations. Only UNS numbers published in this reference appear in Section II, Part A and Part B specifications, and in the various Section II, Part D stress tables, mechanical property tables, and physical property tables.

Nominal compositions are defined by various groups within the ASME Code committee structure and there are no published guidelines describing how these designations are developed. These designations have the greatest relevance in the arrangement of ferrous materials and, as indicated previously, the simplest way to obtain these designations is to look in Section IX of the ASME Boiler and Pressure Vessel Code and use Table QW/QB-422, which is arranged by increasing specification number. These start with the "SA" specification numbers, followed by the "SB" numbers.

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Table 1A
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design/UNS No.	Condition/Temper		
(23)	Carbon steel	Sheet	SA-1008	CS-A	...	...	...	1 1
	Carbon steel	Sheet	SA-1008	CS-B	...	...	...	1 1
	Carbon steel	Bar	SA-675	45	...	...	...	1 1
	Carbon steel	Wld. pipe	SA-134	A283A	...	...	...	1 1
	...	...	...	...	...	...	...	...
	Carbon steel	Plate	SA-285	A	K01700	...	...	1 1
	Carbon steel	Wld. pipe	SA-672	A45	K01700	...	...	1 1
	Carbon steel	Sheet	SA-414	A	K01501	...	...	1 1
	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1 1
	Carbon steel	Wld. tube	SA-178	A	K01200	...	...	1 1
	Carbon steel	Smls. tube	SA-179	...	K01200	...	...	1 1
	Carbon steel	Smls. tube	SA-192	...	K01201	...	...	1 1
	Carbon steel	Wld. tube	SA-214	...	K01807	...	...	1 1
	Carbon steel	Smls. tube	SA-556	A2	K01807	...	...	1 1
	Carbon steel	Wld. tube	SA-557	A2	K01807	...	...	1 1
(23)	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1 1
	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1 1
	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1 1
	Carbon steel	Wld. pipe	SA-53	F/A	...	...	...	1 1
	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	...	1 1
	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1 1
	Carbon steel	Wld. pipe	SA-135	A	...	...	...	1 1
	Carbon steel	Forged pipe	SA-369	FPA	K02501	...	...	1 1
	Carbon steel	Wld. pipe	SA-587	...	K11500	...	...	1 1
	Carbon steel	Wld. pipe	SA-587	...	K11500	...	...	1 1
	Carbon steel	Bar	SA-675	50	...	...	...	1 1
	Carbon steel	Bar	SA-675	50	...	...	...	1 1
	Carbon steel	Wld. pipe	SA-134	A283B	...	...	...	1 1
	...	...	...	...	...	...	...	...
	Carbon steel	Plate	SA-285	B	K02200	...	...	1 1
(23)	Carbon steel	Plate	SA-285	B	K02200	...	...	1 1
	Carbon steel	Wld. pipe	SA-672	A50	K02200	...	...	1 1
	Carbon steel	Sheet	SA-414	B	K02201	...	...	1 1
	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	6 < t ≤ 10	1 1
	Carbon steel	Plate	SA/EN 10028-2	P235GH	...	...	≤ 2 1/4	1 1
	Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...	1 5/8 < t ≤ 2 1/2	1 1
	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	4 < t ≤ 6	1 1
	Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...	5/8 < t ≤ 1 5/8	1 1
	Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...	t ≤ 5/8	1 1
	Carbon steel	Sheet, strip	SA-1011	36	SS	Type 1	t ≤ 0.23	...
	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	2 1/4 < t ≤ 4	1 1
	Carbon steel	Sheet, strip	SA-1011	40	SS	...	t ≤ 0.23	...
	Carbon steel	Sheet, strip	SA-1011	45	HSLAS	2	...	...
	Carbon steel	Bar	SA-675	55	...	...	...	1 1

Table 1A
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	40	20	NP	NP	650	NP	CS-6	...
2	40	20	NP	NP	650	NP	CS-6	...
3	45	22.5	NP	650 (Cl. 3 only)	900	650	CS-6	G10, G22, T10
4	45	24	NP	300 (Cl. 3 only)	NP	NP	CS-1	W12
5	...	...	...	...	...	...	...	...
6	45	24	900	700	900	650	CS-1	G10, T2
7	45	24	NP	700	NP	NP	CS-1	S6, W10, W12
8	45	25	NP	NP	900	650	CS-1	G10, T2
9	47	26	1000	NP	NP	NP	CS-1	G4, G10, S1, T2, W13
10	47	26	1000	NP	1000	650	CS-1	G3, G10, G24, S1, T2, W6
11	47	26	NP	NP	900	650	CS-1	G10, T2
12	47	26	1000	NP	1000	650	CS-1	G10, S1, T2
13	47	26	NP	NP	1000	650	CS-1	G24, T2, W6
14	47	26	NP	NP	1000	650	CS-1	G10, T2
15	47	26	NP	NP	1000	650	CS-1	G24, T2, W6
16	48	30	900	NP	NP	NP	CS-2	G3, G10, S1, T2
17	48	30	900	300 (Cl. 3 only)	NP	NP	CS-2	G10, S1, T2, W12, W13
18	48	30	NP	NP	900	650	CS-2	G24, T2, W6
19	48	30	750	NP	NP	NP	CS-2	G2, G10, S10, T2, W15
20	48	30	900	300 (Cl. 3 only)	NP	NP	CS-2	G10, S1, T2
21	48	30	NP	700 (SPT)	900	650	CS-2	G10, T2
22	48	30	1000	700	1000	650	CS-2	G10, S1, T1
23	48	30	NP	NP	900	650	CS-2	G24, T2, W6
24	48	30	1000	NP	NP	NP	CS-2	G10, S1, T1
25	48	30	NP	300 (Cl. 3 only)	NP	NP	CS-2	...
26	48	30	NP	NP	850	650	CS-2	G24, T2, W6
27	50	25	NP	650 (Cl. 3 only)	NP	NP	CS-1	...
28	50	25	850	700 (SPT)	900	650	CS-1	G10, G15, G22, S1, T2
29	50	27	NP	300 (Cl. 3 only)	NP	NP	CS-1	W12
30	...	...	...	...	...	...	...	...
31	50	27	900	NP	NP	NP	CS-1	G10, S1, T1
32	50	27	NP	700	900	650	CS-1	G10, T1
33	50	27	NP	700	NP	NP	CS-1	S6, T1, W10, W12
34	50	30	NP	NP	900	650	CS-2	G10, T1
35	51	31	NP	NP	400	NP	CS-2	G10
36	52	31	NP	NP	700	NP	CS-2	T11
37	52	31	1000	NP	1000	NP	CS-2	G10, S1, T2, W14
38	52	32.5	NP	NP	400	NP	CS-2	G10
39	52	32.5	1000	NP	1000	NP	CS-2	G10, S1, T2, W14
40	52	34	1000	NP	1000	NP	CS-2	G10, S1, T2, W14
41	53	36	NP	NP	600	600	CS-2	...
42	53.5	34	NP	NP	400	NP	CS-2	G10
43	55	40	NP	NP	600	600	CS-2	...
44	55	45	NP	NP	600	600	CS-3	...
45	55	27.5	850	700 (SPT)	900	650	CS-1	G10, G15, G22, S1, T2

Table 1A
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	11.4	11.4	11.4	...	11.4	11.4	10.9	10.2	9.99	...	...	...	...	...
2	11.4	11.4	11.4	...	11.4	11.4	10.9	10.2	9.9	...	...	...	...	...
3	12.9	12.9	12.9	...	12.9	12.8	12.2	11.5	11.1	10.7	10.4	9.2	7.9	5.9
4	12.9	...	12.9	...	12.9	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	12.9	12.9	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	10.7	9.2	7.9	5.9
7	12.9	...	12.9	...	12.9	12.9	12.9	12.3	11.9	11.5	...	...	...	...
8	12.9	12.9	12.9	...	12.9	12.9	12.9	12.8	12.4	11.9	10.7	9.2	7.9	5.9
9	13.4	...	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	5.9
10	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	5.0
11	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	5.9
12	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	5.9
13	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	5.0
14	13.4	13.4	13.4	...	13.4	13.4	13.4	13.3	12.8	12.4	10.7	9.2	7.9	5.9
15	11.4	11.4	11.4	...	11.4	11.4	11.4	11.3	10.9	10.5	9.1	7.8	6.7	5.0
16	11.7	...	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.7	6.1	4.3
17	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
18	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.9	6.7	5.5
19	8.2	...	8.2	...	8.2	8.2	8.2	8.2	8.2	7.5	6.4	...	...	...
20	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
21	13.7	13.7	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.3	7.9	6.5
22	13.7	13.7	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.3	7.9	6.5
23	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.9	6.7	5.5
24	13.7	...	13.7	...	13.7	13.7	13.7	13.7	13.7	12.5	10.7	9.0	7.1	5.0
25	13.7	...	13.7	...	13.7	...	...	...	...	...	...	...	...	...
26	11.7	11.7	11.7	...	11.7	11.7	11.7	11.7	11.7	10.6	9.1	7.9	6.7	...
27	14.3	...	14.3	...	14.3	14.2	13.6	12.8	12.4	...	...	...	...	...
28	14.3	14.3	14.3	...	14.3	14.2	13.6	12.8	12.4	11.9	10.7	9.3	7.9	6.5
29	14.3	...	14.3	...	14.3	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	14.3	...	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	11.0	9.4	7.3	5.0
32	14.3	14.3	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	11.2	9.6	8.1	5.9
33	14.3	...	14.3	...	14.3	14.3	14.3	13.8	13.3	12.5	...	...	...	...
34	14.3	14.3	14.3	...	14.3	14.3	14.3	14.3	14.3	12.5	11.2	9.6	8.1	5.9
35	14.5	14.5	14.5	...	14.5	14.5	...	...	...	...	...	...	...	...
36	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.6	12.5	...	...	...	...
37	14.9	...	14.9	...	14.9	14.9	14.9	14.9	14.9	14.9	13.0	10.8	8.7	5.9
38	14.9	14.9	14.9	...	14.9	14.9	...	...	...	...	...	...	...	...
39	14.9	...	14.9	...	14.9	14.9	14.9	14.9	14.9	14.9	13.0	10.8	8.7	5.9
40	14.9	...	14.9	...	14.9	14.9	14.9	14.9	14.9	14.9	13.0	10.8	8.7	5.9
41	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	...	...	...	...	...	...
42	15.3	15.3	15.3	...	15.3	15.3	...	...	...	...	...	...	...	...
43	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	...	...	...	...	...	...
44	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	...	...	...	...	...	...
45	15.7	15.7	15.7	...	15.7	15.7	14.9	14.1	13.6	13.1	12.7	10.8	8.7	5.9

Table 1A
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
10	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
13	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
14	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
15	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	3.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
40	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design/UNS No.	Condition/Temper		
1	Carbon steel	Bar	SA-675	55	...	...	...	1 1
2	Carbon steel	Wld. pipe	SA-134	A283C	K02401	...	...	1 1
3	Carbon steel	Plate	SA-283	C	K02401	...	...	1 1
4	Carbon steel	Plate	SA-285	C	K02801	...	...	1 1
5	Carbon steel	Smls. & wld. pipe	SA-333	1	K03008	...	...	1 1
6	Carbon steel	Smls. & wld. tube	SA-334	1	K03008	...	...	1 1
7	Carbon steel	Wld. tube	SA-334	1	K03008	...	...	1 1
8	Carbon steel	Plate	SA-516	55	K01800	...	...	1 1
9	Carbon steel	Smls. pipe	SA-524	II	K02104	...	...	1 1
10	Carbon steel	Wld. pipe	SA-671	CA55	K02801	...	...	1 1
11	Carbon steel	Wld. pipe	SA-671	CE55	K02202	...	...	1 1
12	Carbon steel	Wld. pipe	SA-672	A55	K02801	...	...	1 1
13	Carbon steel	Wld. pipe	SA-672	B55	K02001	...	...	1 1
14	Carbon steel	Wld. pipe	SA-672	C55	K01800	...	...	1 1
15	Carbon steel	Wld. pipe	SA-672	E55	K02202	...	...	1 1
16	Carbon steel	Sheet	SA-414	C	K02503	...	...	1 1
17	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	$\leq 2\frac{1}{4}$	1 1
18	Carbon steel	Bar	SA-36	...	K02600	...	...	1 1
19	Carbon steel	Plate, sheet	SA-36	...	K02600	...	...	1 1
20	Carbon steel	Plate, sheet	SA-662	A	K01701	...	...	1 1
21	Carbon steel	Sheet, strip	SA-1011	36	SS	Type 2	$t \leq 0.23$	...
22	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...	$t > 1\frac{1}{2}$	1 1
23	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...	$t > 1\frac{1}{2}$	1 1
(23) 24	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...	$t > 1\frac{1}{2}$	1 1
25	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...	$t > 1\frac{1}{2}$	1 1
26	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...	$\frac{3}{4} < t \leq 1\frac{1}{2}$	1 1
27	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...	$\frac{3}{4} < t \leq 1\frac{1}{2}$	1 1
(23) 28	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...	$\frac{3}{4} < t \leq 1\frac{1}{2}$	1 1
29	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...	$\frac{3}{4} < t \leq 1\frac{1}{2}$	1 1
30	Carbon steel	Plate	SA/EN 10028-2	P265GH	...	...	$\leq 2\frac{1}{4}$	1 1
31	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	1 1
32	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...	$t \leq \frac{3}{4}$	1 1
33	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...	$t \leq \frac{3}{4}$	1 1
(23) 34	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...	$t \leq \frac{3}{4}$	1 1
35	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...	$t \leq \frac{3}{4}$	1 1
36	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...	$\frac{5}{8} < t \leq 1\frac{5}{8}$	1 1
37	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...	$t \leq \frac{5}{8}$	1 1
38	Carbon steel	Forgings	SA-181	...	K03502	60	...	1 1
39	Carbon steel	Castings	SA-216	WCA	J02502	...	...	1 1
40	Carbon steel	Forgings	SA-266	1	K03506	...	...	1 1
41	Carbon steel	Forgings	SA-350	LF1	K03009	1	...	1 1
42	Carbon steel	Castings	SA-352	LCA	J02504	...	...	1 1
43	Carbon steel	Cast pipe	SA-660	WCA	J02504	...	...	1 1
44	Carbon steel	Bar	SA-675	60	...	...	...	1 1
45	Carbon steel	Bar	SA-675	60	...	...	...	1 1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	55	27.5	NP	650 (Cl. 3 only)	NP	NP	CS-1	...
2	55	30	NP	300 (Cl. 3 only)	NP	NP	CS-2	W12
3	55	30	NP	300 (Cl. 3 only)	650	650	CS-2	...
4	55	30	900	700	900	650	CS-2	G10, S1, T2
5	55	30	NP	700	650	650	CS-2	W12, W14
6	55	30	NP	700	650	650	CS-2	W12, W14
7	55	30	NP	NP	650	650	CS-2	G24, W6
8	55	30	850	700	1000	650	CS-2	G10, S1, T2
9	55	30	NP	NP	1000	650	CS-2	G10, T2
10	55	30	NP	700	NP	NP	CS-2	S6, W10, W12
11	55	30	NP	700	NP	NP	CS-2	S6, W10, W12
12	55	30	NP	700	NP	NP	CS-2	S6, W10, W12
13	55	30	NP	700	NP	NP	CS-2	S6, W10, W12
14	55	30	NP	700	NP	NP	CS-2	S6, W10, W12
15	55	30	NP	700	NP	NP	CS-2	S6, W10, W12
16	55	33	NP	700	900	650	CS-2	G10, T1
17	56.5	...	NP	NP	400	400	CS-2	G10, G18
18	58	36	650	650 (SPT)	900	650	CS-2	G10, G15, T1
19	58	36	NP	700	650	650	CS-2	G9, G10, T1
20	58	40	NP	NP	700	650	CS-2	T1
21	58	36	NP	NP	600	600	CS-2	...
22	59.5	33.4	NP	NP	650	650	CS-2	...
23	59.5	33.4	NP	NP	650	650	CS-2	...
24	59.5	36.3	NP	NP	650	650	CS-2	...
25	59.5	33.4	NP	NP	650	NP	CS-2	...
26	59.5	34.8	NP	NP	650	650	CS-2	...
27	59.5	34.8	NP	NP	650	650	CS-2	...
28	59.5	34.8	NP	NP	650	650	CS-2	...
29	59.5	34.8	NP	NP	650	650	CS-2	...
30	59.5	35.5	NP	NP	700	NP	CS-2	T1
31	59.5	35.5	1000	NP	1000	NP	CS-2	G10, S1, T2
32	59.5	36.3	NP	NP	650	650	CS-2	...
33	59.5	36.3	NP	NP	650	650	CS-2	...
34	59.5	33.4	NP	NP	650	650	CS-2	...
35	59.5	36.3	NP	NP	650	650	CS-2	...
36	59.5	37	1000	NP	1000	NP	CS-2	G10, S1, T2
37	59.5	38.5	1000	NP	1000	NP	CS-2	G10, S1, T2
38	60	30	1000	700	1000	650	CS-2	G10, S1, T2
39	60	30	1000	700	1000	650	CS-2	G1, G10, G17, S1, T2
40	60	30	1000	700	1000	650	CS-2	G10, S1, T2
41	60	30	NP	700	1000	650	CS-2	G10, T2
42	60	30	NP	700	NP	NP	CS-2	G17
43	60	30	1000	700	NP	NP	CS-2	G1, G10, G17, S1, T2
44	60	30	850	700 (SPT)	NP	NP	CS-2	G10, G15, S1, T2
45	60	30	NP	650 (Cl. 3 only)	900	650	CS-2	G10, G22, T2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	15.7	...	15.7	...	15.7	15.7	14.9	14.1	13.6	...	...	...	...	...
2	15.7	...	15.7	...	15.7	...	...	...	...	...	...	...	...	...
3	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	...	...	...	...	...
4	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
5	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
6	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
7	13.4	13.4	13.4	...	13.4	13.4	13.4	13.0	12.6	...	...	...	...	...
8	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
9	15.7	15.7	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	13.0	10.8	8.7	5.9
10	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
11	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
12	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
13	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
14	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
15	15.7	...	15.7	...	15.7	15.7	15.7	15.3	14.8	14.3	...	...	...	...
16	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.6	13.0	10.8	8.7	5.9
17	16.2	16.2	16.2	...	16.2	16.2	...	...	...	...	...	...	...	...
18	16.6	16.6	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	13.0	10.8	8.7	5.9
19	16.6	...	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	...	...	...	...
20	16.6	16.6	16.6	...	16.6	16.6	16.6	16.6	16.6	15.6	...	...	...	...
21	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	...	...	...	...	...	...
22	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.5	...	...	...	...	...
23	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.5	...	...	...	...	...
24	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
25	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.5	...	...	...	...	...
26	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
27	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
28	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
29	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
30	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	15.6	...	...	...	...
31	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	17.0	13.0	10.8	8.7	5.9
32	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
33	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
34	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.5	...	...	...	...	...
35	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	...	...	...	...	...
36	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	17.0	13.0	10.8	8.7	5.9
37	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	17.0	13.0	10.8	8.7	5.9
38	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
39	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
40	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
41	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
42	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	...	...	...	...
43	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
44	17.1	...	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	...
45	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
9	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
37	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
38	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
39	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
40	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
41	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	Group P-No.	No.
1	Carbon steel	Forgings	SA-765	I	K03046 ...	...	...	1	1
2	Carbon steel	Plate	SA-515	60	K02401 ...	...	...	1	1
3	Carbon steel	Plate	SA-516	60	K02100 ...	...	...	1	1
4	Carbon steel	Wld. pipe	SA-671	CB60	K02401 ...	...	...	1	1
5	Carbon steel	Wld. pipe	SA-671	CC60	K02100 ...	...	...	1	1
6	Carbon steel	Wld. pipe	SA-671	CE60	K02402 ...	...	...	1	1
7	Carbon steel	Wld. pipe	SA-672	B60	K02401 ...	...	...	1	1
8	Carbon steel	Wld. pipe	SA-672	C60	K02100 ...	...	...	1	1
9	Carbon steel	Wld. pipe	SA-672	E60	K02402 ...	...	...	1	1
10	Carbon steel	Wld. pipe	SA-134	A283D	K02702 ...	...	...	1	1
11	Carbon steel	Plate	SA-283	D	K02702 ...	...	...	1	1
12	Carbon steel	Wld. pipe	SA-53	E/B	K03005 ...	...	...	1	1
13	Carbon steel	Wld. pipe	SA-53	E/B	K03005 ...	...	...	1	1
14	Carbon steel	Smls. pipe	SA-53	S/B	K03005 ...	...	...	1	1
15	Carbon steel	Smls. pipe	SA-53	S/B	K03005 ...	...	...	1	1
16	Carbon steel	Smls. pipe	SA-106	B	K03006 ...	...	...	1	1
17	Carbon steel	Wld. pipe	SA-135	B	...	...	...	1	1
18	Carbon steel	Smls. & wld. fittings	SA-234	WPB	K03006 ...	...	...	1	1
19	Carbon steel	Smls. & wld. pipe	SA-333	6	K03006 ...	...	...	1	1
20	Carbon steel	Wld. pipe	SA-333	6	K03006 ...	...	...	1	1
21	Carbon steel	Smls. & wld. tube	SA-334	6	K03006 ...	...	...	1	1
22	Carbon steel	Wld. tube	SA-334	6	K03006 ...	...	...	1	1
23	Carbon steel	Forged pipe	SA-369	FPB	K03006 ...	...	...	1	1
24	Carbon steel	Forgings	SA-372	A	K03002 ...	...	...	1	1
25	Carbon steel	Sheet	SA-414	D	K02505 ...	...	...	1	1
26	Carbon steel	Smls. & wld. fittings	SA-420	WPL6	...	...	...	1	1
27	Carbon steel	Smls. pipe	SA-524	I	K02104 ...	...	...	1	1
28	Carbon steel	Bar	SA-696	B	K03200 ...	...	...	1	1
(23) 29	Carbon steel	Forgings	SA-727	...	K02506 ...	...	...	1	1
30	Carbon steel	Wld. tube	SA-178	C	K03503 ...	...	...	1	1
31	Carbon steel	Wld. tube	SA-178	C	K03503 ...	...	...	1	1
32	Carbon steel	Wld. tube	SA-178	C	K03503 ...	...	...	1	1
33	Carbon steel	Smls. tube	SA-210	A-1	K02707 ...	...	...	1	1
34	Carbon steel	Smls. tube	SA-556	B2	K02707 ...	...	...	1	1
35	Carbon steel	Wld. tube	SA-557	B2	K03007 ...	...	...	1	1
(23) 36	Carbon steel	Plate, bar	SA/CSA-G40.21	38W	...	...	...	1	1
37	Carbon steel	Plate, sheet, bar	SA-572	42	...	...	$t \leq 6$	...	...
38	Carbon steel	Sheet, strip	SA-1011	45	HSLAS 1	...	...	...	...
39	Carbon steel	Sheet, strip	SA-1011	45	SS	...	$t \leq 0.23$	...	...
40	Carbon steel	Sheet, strip	SA-1011	50	HSLAS 2	...	...	...	...
41	Carbon steel	Plate	SA/AS 1548	PT430N	...	Normalized	≤ 6	1	1
42	Carbon steel	Plate	SA/AS 1548	PT430NR	...	Norm. rld.	≤ 6	1	1
43	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$6 < t \leq 10$	1	1
44	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$4 < t \leq 6$	1	1
45	Carbon steel	Bar	SA-675	65	...	...	...	1	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	60	30	NP	NP	1000	650	CS-2	G10, T2
2	60	32	1000	700	1000	650	CS-2	G10, S1, T2
3	60	32	850	700	1000	650	CS-2	G10, S1, T2
4	60	32	NP	700	NP	NP	CS-2	S6, W10, W12
5	60	32	NP	700	NP	NP	CS-2	S6, W10, W12
6	60	32	NP	700	NP	NP	CS-2	S6, W10, W12
7	60	32	NP	700	NP	NP	CS-2	S6, W10, W12
8	60	32	NP	700	NP	NP	CS-2	S6, W10, W12
9	60	32	NP	700	NP	NP	CS-2	S6, W10, W12
10	60	33	NP	300 (Cl. 3 only)	NP	NP	CS-2	W12
11	60	33	NP	300 (Cl. 3 only)	650	650	CS-2	...
12	60	35	900	300 (Cl. 3 only)	NP	NP	CS-2	G10, S1, T1, W12, W13
13	60	35	900	NP	900	650	CS-2	G3, G10, G24, S1, T1, W6
14	60	35	900	300 (Cl. 3 only)	NP	NP	CS-2	G10, S1, T1
15	60	35	NP	700 (SPT)	900	650	CS-2	G10, T1
16	60	35	1000	700	1000	650	CS-2	G10, S1, T1
17	60	35	NP	NP	900	650	CS-2	G24, T1, W6
18	60	35	1000	700	1000	650	CS-2	G10, S1, T1
19	60	35	700	700	1000	650	CS-2	G10, T1, W12, W13, W14
20	60	35	700	NP	NP	NP	CS-2	T1
21	60	35	NP	700	650	650	CS-2	T1, W12, W14
22	60	35	NP	NP	650	650	CS-2	G24, W6
23	60	35	1000	NP	NP	NP	CS-2	G10, S1, T1
24	60	35	NP	NP	650	650	CS-2	...
25	60	35	NP	NP	900	650	CS-2	G10, T1
26	60	35	NP	700	850	650	CS-2	G10, T1, W14
27	60	35	NP	NP	1000	650	CS-2	G10, T1
28	60	35	NP	700	NP	NP	CS-2	T1
29	60	36	NP	700	1000	650	CS-3	G10, T1
30	60	37	1000	NP	NP	NP	CS-2	G4, G10, S1, T2
31	60	37	1000	700	NP	NP	CS-2	G10, S1, T1, W13
32	60	37	1000	NP	1000	650	CS-2	G3, G10, G24, S1, T2, W6
33	60	37	1000	700	1000	650	CS-2	G10, S1, T1
34	60	37	NP	NP	1000	650	CS-2	G10, T1
35	60	37	NP	NP	1000	650	CS-2	G24, T1, W6
36	60	38	NP	NP	650	650	CS-2	...
37	60	42	NP	NP	600	600	CS-3	...
38	60	45	NP	NP	600	600	CS-3	...
39	60	45	NP	NP	600	600	CS-3	...
40	60	50	NP	NP	600	600	CS-3	...
41	62.5	...	1000	NP	1000	NP	CS-2	G10, G18, S1, T1
42	62.5	...	1000	NP	1000	NP	CS-2	G10, G18, S1, T1
43	62.5	32	850	NP	1000	NP	CS-2	G10, S1, T2
44	64	34	850	NP	1000	NP	CS-2	G10, S1, T2
45	65	32.5	850	650 (Cl. 3 only)	1000	650	CS-2	G10, G15, G22, S1, T2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	17.1	17.1	17.1	...	17.1	17.1	16.3	15.3	14.8	14.3	13.0	10.8	8.7	5.9
2	17.1	17.1	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	13.0	10.8	8.7	5.9
3	17.1	17.1	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	13.0	10.8	8.7	5.9
4	17.1	...	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	...	...	...	...
5	17.1	...	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	...	...	...	...
6	17.1	...	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	...	...	...	...
7	17.1	...	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	...	...	...	...
8	17.1	...	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	...	...	...	...
9	17.1	...	17.1	...	17.1	17.1	17.1	16.4	15.8	15.3	...	...	...	...
10	17.1	...	17.1	...	17.1	...	...	...	...	...	...	...	...	...
11	17.1	17.1	17.1	...	17.1	17.1	17.1	16.9	16.3	...	...	...	...	...
12	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
13	14.6	14.6	14.6	...	14.6	14.6	14.6	14.6	14.6	13.3	11.1	9.2	7.4	5.0
14	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
15	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
16	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
17	14.6	14.6	14.6	...	14.6	14.6	14.6	14.6	14.6	13.3	11.1	9.2	7.4	5.0
18	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
19	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
20	14.6	14.6	14.6	...	14.6	14.6	14.6	14.6	14.6	13.3	...	...	...	...
21	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	...	...	...	...
22	14.6	14.6	14.6	...	14.6	14.6	14.6	14.6	14.6	...	...	...	...	...
23	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
24	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...
25	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
26	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	...
27	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
28	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	...	...	...	...
29	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
30	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.0
31	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
32	14.6	...	14.6	...	14.6	14.6	14.6	14.6	14.6	13.3	11.1	9.2	7.4	5.0
33	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
34	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	15.6	13.0	10.8	8.7	5.9
35	14.6	14.6	14.6	...	14.6	14.6	14.6	14.6	14.6	13.3	11.1	9.2	7.4	5.0
36	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...
37	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...	...
38	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...	...
39	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...	...
40	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...	...
41	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	16.9	13.9	11.4	8.7	5.9
42	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	16.9	13.9	11.4	8.7	5.9
43	17.9	17.9	17.9	17.9	17.9	17.9	17.4	16.4	15.8	15.3	13.9	11.4	8.7	5.9
44	18.3	18.3	18.3	18.3	18.3	18.3	18.3	17.4	16.8	16.2	13.9	11.4	8.7	5.9
45	18.6	18.6	18.6	18.6	18.6	18.5	17.7	16.6	16.1	15.5	13.9	11.4	8.7	5.0

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
2	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
3	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
19	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
30	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
31	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
32	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
33	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
34	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
35	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
42	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
43	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
44	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
45	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
					Design/ UNS No.				
1	Carbon steel	Castings	SA-352	LCB	J03003	...	...	1	1
2	Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
3	Carbon steel	Plate	SA-516	65	K02403	...	...	1	1
4	Carbon steel	Wld. pipe	SA-671	CB65	K02800	...	...	1	1
5	Carbon steel	Wld. pipe	SA-671	CC65	K02403	...	...	1	1
6	Carbon steel	Wld. pipe	SA-672	B65	K02800	...	...	1	1
7	Carbon steel	Wld. pipe	SA-672	C65	K02403	...	...	1	1
8	Carbon steel	Sheet	SA-414	E	K02704	...	...	1	1
9	Carbon steel	Plate	SA-662	B	K02203	...	...	1	1
10	Carbon steel	Plate	SA-537	...	K12437	1	$2\frac{1}{2} < t \leq 4$	1	2
11	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$2\frac{1}{2} < t \leq 4$	1	2
12	Carbon steel	Plate, sheet, bar	SA-572	50	...	...	$t \leq 4$	...	...
13	Carbon steel	Round bar	SA-572	50	...	...	$t \leq 11$	...	...
14	Carbon steel	Sheet, strip	SA-1011	50	SS	...	$t \leq 0.23$	...	...
15	Carbon steel	Sheet, strip	SA-1011	50	HSLAS	1	...	...	...
16	Carbon steel	Sheet, strip	SA-1011	55	HSLAS	2	...	...	...
17	Carbon steel	Plate, bar	SA/CSA-G40.21	44W	...	...	$t \leq 8$	1	1
18	Carbon steel	Plate, bar	SA/CSA-G40.21	50W	...	...	$t \leq 6$	1	1
19	Carbon steel	Plate	SA/AS 1548	PT460N	...	Normalized	≤ 6	1	1
20	Carbon steel	Plate	SA/AS 1548	PT460NR	...	Norm. rld.	≤ 6	1	1
21	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	NT or QT	$1.4 < t \leq 6.3$	1	1
22	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$2\frac{1}{4} < t \leq 4$	1	1
23	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$\leq 2\frac{1}{4}$	1	1
24	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	Normalized	$t \leq 1.4$	1	1
25	Carbon steel	Plate	SA/GB 713	Q345R	...	...	$6 < t \leq 10$	1	2
26	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$6 < t \leq 10$	1	2
27	Carbon steel	Plate	SA/GB 713	Q345R	...	...	$4 < t \leq 6$	1	2
28	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$4 < t \leq 6$	1	2
29	Carbon steel	Plate	SA-455	...	K03300	...	$0.58 < t \leq \frac{3}{4}$	1	2
30	Carbon steel	Bar	SA-675	70	...	...	...	1	2
31	Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2
32	Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2
33	Carbon steel	Castings	SA-216	WCB	J03002	...	...	1	2
34	Carbon steel	Forgings	SA-266	2	K03506	...	...	1	2
35	Carbon steel	Forgings	SA-266	4	K03017	...	...	1	2
36	Carbon steel	Forgings	SA-350	LF2	K03011	1	...	1	2
37	Carbon steel	Forgings	SA-350	LF2	K03011	2	...	1	2
38	Carbon steel	Forgings	SA-508	1	K13502	...	...	1	2
39	Carbon steel	Forgings	SA-508	1A	K13502	...	...	1	2
40	Carbon steel	Forgings	SA-541	1	K03506	...	...	1	2
41	Carbon steel	Forgings	SA-541	1A	K03020	...	...	1	2
42	Carbon steel	Cast pipe	SA-660	WCB	J03003	...	...	1	2
43	Carbon steel	Forgings	SA-765	II	K03047	...	...	1	2
44	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2
45	Carbon steel	Plate	SA-516	70	K02700	...	...	1	2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	65	35	NP	700	650	650	CS-2	G1, G17
2	65	35	1000	700	1000	650	CS-2	G10, S1, T2
3	65	35	850	700	1000	650	CS-2	G10, S1, T2
4	65	35	NP	700	NP	NP	CS-2	S6, W10, W12
5	65	35	NP	700	NP	NP	CS-2	S6, W10, W12
6	65	35	NP	700	NP	NP	CS-2	S6, W10, W12
7	65	35	NP	700	NP	NP	CS-2	S6, W10, W12
8	65	38	NP	NP	900	650	CS-2	G10, T1
9	65	40	NP	NP	700	650	CS-2	T1
10	65	45	NP	700	650	650	CS-2	T1
11	65	45	NP	700	NP	NP	CS-2	G26, T1, W10, W12
12	65	50	NP	NP	600	600	CS-3	...
13	65	50	NP	NP	600	600	CS-3	...
14	65	50	NP	NP	600	600	CS-3	...
15	65	50	NP	NP	600	600	CS-3	...
16	65	55	NP	NP	600	600	CS-3	...
17	65	...	650	NP	650	650	CS-2	G18
18	65	...	650	NP	650	650	CS-2	G18
19	66.5	...	1000	NP	1000	NP	CS-2	G10, G18, S1, T1
20	66.5	...	1000	NP	1000	NP	CS-2	G10, G18, S1, T1
21	66.5	37	1000	NP	1000	NP	CS-2	G10, S1, T2
22	66.5	37.5	850	NP	1000	NP	CS-2	G10, S1, T1
23	66.5	...	850	NP	1000	650	CS-2	G10, G18, S1, T1
24	66.5	40.5	1000	NP	1000	NP	CS-2	G10, S1, T2
25	68	38.5	800	NP	800	NP	CS-2	T1
26	68	40.5	850	NP	1000	NP	CS-2	G10, S1, T1
27	69.5	41.5	800	NP	800	NP	CS-2	T1
28	69.5	43	850	NP	1000	NP	CS-2	G10, S1, T1
29	70	35	NP	400 (Cl. 3 only)	650	650	CS-2	...
30	70	35	850	650 (Cl. 3 only)	1000	650	CS-2	G10, G15, G22, S1, T2
31	70	36	1000	700	1000	650	CS-2	G10, S1, T2
32	70	36	1000	700	1000	650	CS-2	G10, S1, T2
33	70	36	1000	700	1000	650	CS-2	G1, G10, G17, S1, T2
34	70	36	1000	700	1000	650	CS-2	G10, S1, T2
35	70	36	NP	NP	1000	650	CS-2	G10, T2
36	70	36	850	700	1000	650	CS-2	G10, T2
37	70	36	850	700	1000	650	CS-2	G10, T2
38	70	36	NP	700	1000	650	CS-2	G10, T2
39	70	36	NP	700	1000	650	CS-2	G10, T2
40	70	36	NP	700	1000	650	CS-2	G10, T2
41	70	36	NP	700	1000	650	CS-2	G10, T2
42	70	36	1000	700	NP	NP	CS-2	G1, G10, G17, S1, T2
43	70	36	NP	NP	1000	650	CS-2	G10, T2
44	70	38	1000	700	1000	650	CS-2	G10, S1, T2
45	70	38	850	700	1000	650	CS-2	G10, S1, T2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
2	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	13.9	11.4	8.7	5.9
3	18.6	18.6	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	13.9	11.4	8.7	5.9
4	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
5	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
6	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
7	18.6	...	18.6	...	18.6	18.6	18.6	17.9	17.3	16.7	...	...	...	...
8	18.6	18.6	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	13.9	11.4	8.7	5.9
9	18.6	18.6	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
10	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
11	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	16.9	...	...	...	...
12	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...	...
13	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...	...
14	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...	...
15	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...	...
16	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...	...
17	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...
18	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	...	...	...	...	...
19	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	16.9	13.9	11.4	8.7	5.9
20	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	16.9	13.9	11.4	8.7	5.9
21	19.1	...	19.1	...	19.1	19.1	19.1	18.8	18.1	17.5	14.8	12.0	9.3	6.7
22	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.5	16.7	13.9	11.4	8.7	5.9
23	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	16.7	13.9	11.4	8.7	5.9
24	19.1	...	19.1	...	19.1	19.1	19.1	19.1	19.1	19.1	14.8	12.0	9.3	6.7
25	19.5	...	19.5	...	19.5	19.5	19.5	19.5	19.0	18.3	14.8	12.0	...	...
26	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	18.3	14.8	12.0	9.3	6.7
27	19.9	...	19.9	...	19.9	19.9	19.9	19.9	19.9	18.3	14.8	12.0	...	...
28	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	18.3	14.8	12.0	9.3	6.7
29	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	...	...	...	...	...
30	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.7	14.8	12.0	9.3	6.7
31	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
32	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
33	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
34	20.0	...	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
35	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
36	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
37	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
38	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
39	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
40	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
41	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
42	20.0	...	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
43	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.2	14.8	12.0	9.3	6.7
44	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	6.7
45	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	6.7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
3	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
20	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
21	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
22	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
23	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
24	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
31	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
32	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
33	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
34	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
35	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
36	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
37	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
38	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
39	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
40	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
41	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
42	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
43	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
44	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
45	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	Group P-No.	No.
1	Carbon steel	Wld. pipe	SA-671	CB70	K03101 ...	...	...	1	2
2	Carbon steel	Wld. pipe	SA-671	CC70	K02700 ...	...	...	1	2
3	Carbon steel	Wld. pipe	SA-672	B70	K03101 ...	...	...	1	2
4	Carbon steel	Wld. pipe	SA-672	C70	K02700 ...	...	...	1	2
5	Carbon steel	Plate	SA/JIS G3118	SGV480	...	...	...	1	2
6	Carbon steel	Smls. pipe	SA-106	C	K03501 ...	...	...	1	2
7	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
8	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
9	Carbon steel	Wld. tube	SA-178	D	...	...	...	1	2
10	Carbon steel	Smls. tube	SA-210	C	K03501 ...	...	...	1	2
11	Carbon steel	Castings	SA-216	WCC	J02503 ...	...	...	1	2
12	Carbon steel	Smls. & wld. fittings	SA-234	WPC	K03501 ...	...	...	1	2
13	Carbon steel	Castings	SA-352	LCC	J02505 ...	...	...	1	2
14	Carbon steel	Castings	SA-487	16	... A	...	...	1	2
15	Carbon steel	Plate	SA-537	...	K12437 3	...	4 < t ≤ 6	1	3
16	Carbon steel	Smls. tube	SA-556	C2	K03006 ...	...	...	1	2
17	Carbon steel	Wld. tube	SA-557	C2	K03505 ...	...	...	1	2
18	Carbon steel	Cast pipe	SA-660	WCC	J02505 ...	...	...	1	2
19	Carbon steel	Bar	SA-696	C	K03200 ...	...	...	1	2
20	Carbon steel	Sheet	SA-414	F	K03102 ...	...	...	1	2
21	Carbon steel	Plate	SA-662	C	K02007 ...	...	...	1	2
22	Carbon steel	Plate	SA-537	...	K12437 2	...	4 < t ≤ 6	1	3
23	Carbon steel	Plate	SA-738	C	K02008 ...	...	4 < t ≤ 6	1	3
24	Carbon steel	Plate	SA-537	...	K12437 1	...	≤ 2 1/2	1	2
25	Carbon steel	Wld. pipe	SA-671	CD70	K12437 ...	...	≤ 2 1/2	1	2
26	Carbon steel	Wld. pipe	SA-672	D70	K12437 ...	...	≤ 2 1/2	1	2
27	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437 ...	...	≤ 2 1/2	1	2
28	Carbon steel	Plate	SA-841	A	... 1	...	≤ 4	1	2
29	Carbon steel	Plate, sheet, bar	SA-572	55	...	...	t ≤ 2	...	...
30	Carbon steel	Round bar	SA-572	55	...	...	t ≤ 3 1/2	...	...
31	Carbon steel	Sheet, strip	SA-1011	55	HSLAS 1	...	...	...	...
32	Carbon steel	Sheet, strip	SA-1011	60	HSLAS 2	...	...	...	...
33	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	NT	1.4 < t ≤ 6.3	1	2
34	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	Normalized	t ≤ 1.4	1	2
35	Carbon steel	Plate	SA/GB 713	Q345R	...	...	2 1/4 < t ≤ 4	1	2
36	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	2.5 < t ≤ 4	1	2
37	Carbon steel	Plate	SA/GB 713	Q345R	...	...	1.5 < t ≤ 2 1/4	1	2
38	Carbon steel	Plate	SA/GB 713	Q345R	...	...	5/8 < t ≤ 1.5	1	2
39	Carbon steel	Plate	SA-455	...	K03300 ...	...	3/8 < t ≤ 0.58	1	2
40	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	QT	t ≤ 2.8	1	2
41	Carbon steel	Plate	SA/GB 713	Q345R	...	...	1/8 ≤ t ≤ 5/8	1	2
42	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	≤ 2.5	1	2
(23) 43	Carbon steel	Forgings	SA-266	3	K05001 ...	...	...	1	2
44	Carbon steel	Plate	SA-455	...	K03300 ...	...	≤ 3/8	1	2
45	Carbon steel	Plate	SA-299	A	K02803 ...	...	> 1	1	2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	70	38	NP	700	NP	NP	CS-2	S5, W10, W12
2	70	38	NP	700	NP	NP	CS-2	S6, W10, W12
3	70	38	NP	700	NP	NP	CS-2	S5, W10, W12
4	70	38	NP	700	NP	NP	CS-2	S6, W10, W12
5	70	38	850	NP	NP	NP	CS-2	G10, S1, T2
6	70	40	1000	700	1000	650	CS-2	G10, S1, T1
7	70	40	1000	NP	NP	NP	CS-2	G10, S1, T1, W13
8	70	40	1000	NP	NP	NP	CS-2	G4, G10, S1, T4
9	70	40	1000	NP	NP	NP	CS-2	G3, G10, S1, T2
10	70	40	1000	NP	1000	650	CS-2	G10, S1, T1
11	70	40	1000	700	1000	650	CS-2	G1, G10, G17, S1, T1
12	70	40	800	700	800	650	CS-2	G10, T1, W14
13	70	40	NP	700	NP	NP	CS-2	G17, T1
14	70	40	NP	700	NP	NP	CS-2	...
15	70	40	NP	NP	700	650	CS-2	G23, W11
16	70	40	NP	NP	800	650	CS-2	G10, T1
17	70	40	NP	NP	1000	650	CS-2	G24, T2, W6
18	70	40	1000	700	NP	NP	CS-2	G1, G10, G17, S1, T1
19	70	40	NP	700	NP	NP	CS-2	T1
20	70	42	NP	NP	900	650	CS-2	G10, T1
21	70	43	NP	NP	700	650	CS-3	T1
22	70	46	NP	700	700	650	CS-3	G23, T1, W11
23	70	46	NP	650	650	650	CS-3	G23, W11
24	70	50	NP	700	650	650	CS-3	G23, T1
25	70	50	NP	700	NP	NP	CS-3	S6, T1, W10, W12
26	70	50	NP	700	NP	NP	CS-3	S6, T1, W10, W12
27	70	50	NP	700	NP	NP	CS-3	S6, T1, W10, W12
28	70	50	NP	NP	650	NP	CS-3	...
29	70	55	NP	NP	600	600	CS-3	...
30	70	55	NP	NP	600	600	CS-3	...
31	70	55	NP	NP	600	600	CS-3	...
32	70	60	NP	NP	600	600	CS-3	...
33	71	40.5	1000	NP	1000	NP	CS-2	G10, S1, T2
34	71	44	1000	NP	1000	NP	CS-2	G10, S1, T2
35	71	44	800	NP	800	NP	CS-2	T1
36	71	45.5	850	NP	1000	NP	CS-2	G10, S1, T1
37	71	45.5	800	NP	800	NP	CS-2	T1
38	72.5	47	800	NP	800	NP	CS-2	T1
39	73	37	NP	400 (Cl. 3 only)	650	650	CS-2	...
40	74	41.5	1000	NP	1000	NP	CS-2	G10, S1, T2
41	74	50	800	NP	800	NP	CS-2	T1
42	74	...	850	NP	1000	NP	CS-2	G10, G18, S1, T1
43	75	37.5	1000	700	1000	NP	CS-2	G10, S1, T2, W11
44	75	38	NP	400 (Cl. 3 only)	650	650	CS-2	...
45	75	40	1000	700	1000	650	CS-2	G10, S1, T2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
2	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
3	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
4	20.0	...	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	...	...	...	...
5	20.0	20.0	20.0	...	20.0	20.0	20.0	19.4	18.8	18.1	14.8	12.0	9.3	...
6	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	6.7
7	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	6.7
8	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	5.7
9	17.0	...	17.0	...	17.0	17.0	17.0	17.0	16.8	15.5	12.6	10.2	7.9	5.7
10	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	6.7
11	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	6.7
12	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	...	...
13	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	...	...	...	...
14	20.0	...	19.9	...	18.8	18.1	17.9	17.9	17.9	...	...	...	...	...
15	20.0	20.0	20.0	...	19.7	19.5	18.9	18.0	17.6	17.2	...	...	...	...
16	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	...	...
17	17.0	17.0	17.0	...	17.0	17.0	17.0	17.0	16.8	15.5	12.6	10.2	7.9	5.7
18	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	14.8	12.0	9.3	6.7
19	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.8	18.3	...	...	...	...
20	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	18.3	14.8	12.0	9.3	6.7	...
21	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	18.3	...	...	...	...	...
22	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	18.3	...	...	...	...
23	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	...	...	...	...	...
24	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	18.3	...	...	...	...
25	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	18.3	...	...	...	...
26	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	18.3	...	...	...	...
27	20.0	...	20.0	...	19.7	19.5	19.5	19.5	19.5	18.3	...	...	...	...
28	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...
29	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	...
30	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	...
31	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	...
32	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	...
33	20.3	...	20.3	...	20.3	20.3	20.3	20.3	19.9	19.2	14.8	12.0	9.3	6.7
34	20.3	...	20.3	...	20.3	20.3	20.3	20.3	20.3	20.0	14.8	12.0	9.3	6.7
35	20.3	...	20.3	...	20.3	20.3	20.3	20.3	20.3	18.3	14.8	12.0	...	...
36	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	18.3	14.8	12.0	9.3	6.7
37	20.3	...	20.3	...	20.3	20.3	20.3	20.3	20.3	18.3	14.8	12.0	...	...
38	20.7	...	20.7	...	20.7	20.7	20.7	20.7	20.7	18.3	14.8	12.0	...	...
39	20.9	20.9	20.9	...	20.9	20.9	20.1	18.9	18.3	...	...	...	...	...
40	21.1	...	21.1	...	21.1	21.1	21.1	21.0	20.3	19.6	14.8	12.0	9.3	6.7
41	21.1	...	21.1	...	21.1	21.1	21.1	21.1	21.1	18.3	14.8	12.0	...	...
42	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	18.3	14.8	12.0	9.3	6.7
43	21.4	21.4	21.4	...	21.4	21.4	20.4	19.2	18.5	17.9	15.7	12.6	9.3	6.7
44	21.4	21.4	21.4	...	21.4	21.4	20.6	19.4	18.8	...	...	...	...	...
45	21.4	21.4	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	15.7	12.6	9.3	6.7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
7	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
8	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
9	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
10	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
11	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...	...	...
18	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
34	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
43	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Group P-No.	No.
1	Carbon steel	Wld. pipe	SA-671	CK75	K02803 ...		>1	1	2
2	Carbon steel	Wld. pipe	SA-672	N75	K02803 ...		>1	1	2
3	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803 ...		>1	1	2
4	Carbon steel	Plate	SA-299	A	K02803 ...		≤1	1	2
5	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803 ...		≤1	1	2
6	Carbon steel	Forgings	SA-372	B	K04001 ...		...	1	2
7	Carbon steel	Sheet	SA-414	G	K03103 ...		...	1	2
8	Carbon steel	Plate	SA-738	A	K12447 ...		...	1	2
9	Carbon steel	Plate	SA-537	...	K12437 3		$2\frac{1}{2} < t \leq 4$	1	3
10	Carbon steel	Plate	SA-537	...	K12437 2		$2\frac{1}{2} < t \leq 4$	1	3
11	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437 ...		$2\frac{1}{2} < t \leq 4$	1	3
12	Carbon steel	Plate	SA-738	C	K02008 ...		$2\frac{1}{2} < t \leq 4$	1	3
13	Carbon steel	Plate, sheet, bar	SA-572	60	...		$t \leq 1\frac{1}{4}$	...	...
14	Carbon steel	Round bar	SA-572	60	...		$t \leq 3\frac{1}{2}$	...	...
15	Carbon steel	Sheet, strip	SA-1011	60	HSLAS 1		...	...	...
16	Carbon steel	Plate	SA-299	B	K02803 ...		>1	1	3
17	Carbon steel	Plate	SA-299	B	K02803 ...		≤1	1	3
18	Carbon steel	Forgings	SA-765	IV	K02009 ...		...	1	3
19	Carbon steel	Plate	SA-537	...	K12437 3		$\leq 2\frac{1}{2}$	1	3
20	Carbon steel	Plate	SA-537	...	K12437 2		$\leq 2\frac{1}{2}$	1	3
21	Carbon steel	Wld. pipe	SA-671	CD80	K12437 ...		$\leq 2\frac{1}{2}$	1	3
22	Carbon steel	Wld. pipe	SA-672	D80	K12437 ...		$\leq 2\frac{1}{2}$	1	3
23	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437 ...		$\leq 2\frac{1}{2}$	1	3
24	Carbon steel	Plate	SA-738	C	K02008 ...		$\leq 2\frac{1}{2}$	1	3
25	Carbon steel	Plate	SA-841	B	...	2	≤4	1	3
26	Carbon steel	Plate, sheet, bar	SA-572	65	...	...	$t \leq 1\frac{1}{4}$	...	...
27	Carbon steel	Plate	SA-612	...	K02900 ...		$\frac{1}{2} < t \leq 1$	10C	1
28	Carbon steel	Plate	SA-612	...	K02900 ...		$\leq \frac{1}{2}$	10C	1
29	Carbon steel	Plate	SA-738	B	K12007 ...		...	1	3
30	Carbon steel	Forgings	SA-372	C	K04801 ...		...	...	...
31	Carbon steel	Plate	SA-724	A	K11831 ...		...	1	4
32	Carbon steel	Plate	SA-724	C	K12037 ...		...	1	4
33	Carbon steel	Plate	SA-724	B	K12031 ...		...	1	4
34	C-Mn-Si-Cb	Plate	SA-737	B	K12001 ...		...	1	2
35	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490N	...	Normalized	≤6	1	2
36	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490NR	...	Norm. rld.	≤6	1	2
37	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$2.5 < t \leq 4$	1	2
38	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$1.5 < t \leq 2.5$	1	2
39	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$0.6 < t \leq 1.5$	1	2
40	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$0.4 \leq t \leq 0.6$	1	2
41	C-Mn-Si-V	Plate	SA-737	C	K12202 ...		...	1	3
42	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	≤2	1	1
43	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	≤2	1	1
44	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	$\leq 1\frac{1}{2}$	1	2
45	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	$\leq 1\frac{1}{2}$	1	2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	40	NP	700	NP	NP	CS-2	S6, W10, W12
2	75	40	NP	700	NP	NP	CS-2	S6, W10, W12
3	75	40	NP	700	NP	NP	CS-2	S6, W10, W12
4	75	42	1000	700	1000	650	CS-2	G10, S1, T1
5	75	42	NP	700	NP	NP	CS-2	T1, W10, W12
6	75	45	NP	NP	650	650	CS-3	W11
7	75	45	NP	NP	900	650	CS-3	G10, T1
8	75	45	NP	NP	700	650	CS-2	T1
9	75	50	NP	NP	700	650	CS-5	G23, T1, W11
10	75	55	NP	700	650	650	CS-5	G23, T1, W11
11	75	55	NP	700	NP	NP	CS-5	G26, T1, W10, W12
12	75	55	NP	650	650	650	CS-5	G23, W11
13	75	60	NP	NP	600	600	CS-3	...
14	75	60	NP	NP	600	600	CS-3	...
15	75	60	NP	NP	600	600	CS-3	...
16	80	45	800	NP	1000	650	CS-3	G10, S1, T1
17	80	47	800	NP	1000	650	CS-3	G10, S1, T1
18	80	50	NP	NP	700	NP	CS-3	...
19	80	55	NP	NP	700	650	CS-5	G23, T1, W11
20	80	60	NP	700	650	650	CS-5	G23, S6, T1, W10, W11, W12
21	80	60	NP	700	NP	NP	CS-5	S6, T1, W10, W12
22	80	60	NP	700	NP	NP	CS-5	S6, T1, W10, W12
23	80	60	NP	700	NP	NP	CS-5	S6, T1, W10, W12
24	80	60	NP	650	650	650	CS-5	G23, W11
25	80	60	NP	NP	650	NP	CS-3	...
26	80	65	NP	NP	600	600	CS-3	...
27	81	50	NP	700	650	650	CS-3	T1
28	83	50	NP	650	650	650	CS-3	...
29	85	60	NP	650	650	650	CS-5	...
30	90	55	NP	NP	650	650	CS-3	W11
31	90	70	NP	NP	700	650	CS-5	...
32	90	70	NP	NP	700	650	CS-5	...
33	95	75	NP	NP	700	650	CS-5	...
34	70	50	NP	700	700	650	CS-3	T1
35	71	...	1000	NP	1000	NP	CS-2	G10, G18, S1, T1
36	71	...	1000	NP	1000	NP	CS-2	G10, G18, S1, T1
37	74	48	800	NP	NP	NP	CS-3	T1
38	75.5	49.5	800	NP	NP	NP	CS-3	T1
39	77	52	800	NP	NP	NP	CS-3	T1
40	77	53.5	800	NP	NP	NP	CS-3	T1
41	80	60	NP	700	700	650	CS-3	...
42	60	50	NP	NP	NP	650	...	...
43	60	50	NP	NP	NP	650	...	...
44	70	60	NP	NP	NP	650	...	...
45	70	60	NP	NP	NP	650	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
2	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
3	21.4	...	21.4	...	21.4	21.4	21.4	20.4	19.8	19.1	...	...	...	...
4	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	20.8	19.6	15.7	12.6	9.3	6.7
5	21.4	...	21.4	...	21.4	21.4	21.4	21.4	20.8	19.6	...	...	...	...
6	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	...	...	...	...	...
7	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	21.4	19.6	15.7	12.6	9.3	6.7
8	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	19.6	...	...	...	...
9	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	18.3	...	...	...	...
10	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	19.6	...	...	...	...
11	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	19.6	...	...	...	...
12	21.4	...	21.4	...	21.1	20.9	20.9	20.9	20.9	...	...	...	...	...
13	21.4	21.4	21.4	21.3	21.1	20.9	20.9	20.9	...	...	...	...	...	...
14	21.4	21.4	21.4	21.3	21.1	20.9	20.9	20.9	...	...	...	...	...	...
15	21.4	21.4	21.4	21.3	21.1	20.9	20.9	20.9	...	...	...	...	...	...
16	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.2	19.6	15.7	12.6	9.3	6.7
17	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	19.6	15.7	12.6	9.3	6.7
18	22.9	...	22.9	...	22.9	22.6	22.6	22.6	22.5	22.2	...	...	...	...
19	22.9	...	22.9	...	22.6	22.3	22.3	22.3	22.3	19.6	...	...	...	...
20	22.9	...	22.9	...	22.6	22.3	22.3	22.3	22.3	19.6	...	...	...	...
21	22.9	...	22.9	...	22.6	22.3	22.3	22.3	22.3	19.6	...	...	...	...
22	22.9	...	22.9	...	22.6	22.3	22.3	22.3	22.3	19.6	...	...	...	...
23	22.9	...	22.9	...	22.6	22.3	22.3	22.3	22.3	19.6	...	...	...	...
24	22.9	...	22.9	...	22.6	22.3	22.3	22.3	22.3	...	...	...	...	...
25	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...	...	...	...
26	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...	...	...	...	...
27	23.1	...	23.1	...	22.8	22.6	22.6	22.5	22.0	19.6	...	...	...	...
28	23.7	...	23.7	...	23.4	23.2	23.2	22.5	22.0	...	...	...	...	...
29	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.1	23.7	...	...	...	...	...
30	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	24.4	...	...	...	...	...
31	25.7	25.7	25.7	25.6	25.4	25.1	25.1	25.1	24.4	21.9	...	...	...	...
32	25.7	25.7	25.7	25.6	25.4	25.1	25.1	25.1	24.4	21.9	...	...	...	...
33	27.1	27.1	27.1	27.0	26.8	26.5	26.5	26.5	24.4	23.1	...	...	...	...
34	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	19.6	...	...	...	...
35	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	18.3	14.8	12.0	9.3	6.7
36	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	18.3	14.8	12.0	9.3	6.7
37	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	19.6	15.7	12.6	...	...
38	21.5	...	21.5	...	21.5	21.5	21.5	21.5	21.5	19.6	15.7	12.6	...	...
39	22.0	...	22.0	...	22.0	22.0	22.0	22.0	22.0	19.6	15.7	12.6	...	...
40	22.0	...	22.0	...	22.0	22.0	22.0	22.0	22.0	19.6	15.7	12.6	...	...
41	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	20.0	...	...	...	...
42	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...
43	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...
44	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...
45	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
17	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
36	4.0	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design/UNS No.	Condition/ Temper		
1	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	≤1	1 3
2	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	≤1	1 3
3	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	≤ ³ / ₄	1 4
4	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	≤ ³ / ₄	1 4
5	C-Mn-Ti	Plate, sheet	SA-562	...	K11224	...	...	1 1
6	C-Si-Ti	Forgings	SA-836	...	...	1	...	1 1
7	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...	1 ⁵ / ₈ < t ≤ 2 ¹ / ₂	3 1
8	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...	⁵ / ₈ < t ≤ 1 ⁵ / ₈	3 1
9	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...	t ≤ ⁵ / ₈	3 1
10	C- ¹ / ₂ Mo	Smls. tube	SA-209	T1b	K11422	...	...	3 1
11	C- ¹ / ₂ Mo	Wld. tube	SA-250	T1b	K11422	...	...	3 1
12	C- ¹ / ₂ Mo	Wld. tube	SA-250	T1b	K11422	...	...	3 1
13	C- ¹ / ₂ Mo	Smls. tube	SA-209	T1	K11522	...	...	3 1
14	C- ¹ / ₂ Mo	Smls. & wld. fittings	SA-234	WP1	K12821	...	...	3 1
15	C- ¹ / ₂ Mo	Wld. tube	SA-250	T1	K11522	...	...	3 1
16	C- ¹ / ₂ Mo	Wld. tube	SA-250	T1	K11522	...	...	3 1
17	C- ¹ / ₂ Mo	Smls. pipe	SA-335	P1	K11522	...	...	3 1
18	C- ¹ / ₂ Mo	Forged pipe	SA-369	FP1	K11522	...	...	3 1
19	C- ¹ / ₂ Mo	Smls. tube	SA-209	T1a	K12023	...	...	3 1
20	C- ¹ / ₂ Mo	Wld. tube	SA-250	T1a	K12023	...	...	3 1
21	C- ¹ / ₂ Mo	Wld. tube	SA-250	T1a	K12023	...	...	3 1
22	C- ¹ / ₂ Mo	Castings	SA-217	WC1	J12524	...	...	3 1
23	C- ¹ / ₂ Mo	Castings	SA-352	LC1	J12522	...	...	3 1
24	C- ¹ / ₂ Mo	Cast pipe	SA-426	CP1	J12521	...	...	3 1
25	C- ¹ / ₂ Mo	Plate	SA-204	A	K11820	...	...	3 1
26	C- ¹ / ₂ Mo	Wld. pipe	SA-672	L65	K11820	...	...	3 1
27	C- ¹ / ₂ Mo	Wld. pipe	SA-691	CM-65	K11820	...	...	3 1
28	C- ¹ / ₂ Mo	Wld. pipe	SA-691	CM-65	K11820	...	...	3 1
29	C- ¹ / ₂ Mo	Forgings	SA-182	F1	K12822	...	...	3 2
30	C- ¹ / ₂ Mo	Plate	SA-204	B	K12020	...	...	3 2
31	C- ¹ / ₂ Mo	Forgings	SA-336	F1	K12520	...	...	3 2
32	C- ¹ / ₂ Mo	Wld. pipe	SA-672	L70	K12020	...	...	3 2
33	C- ¹ / ₂ Mo	Wld. pipe	SA-691	CM-70	K12020	...	...	3 2
34	C- ¹ / ₂ Mo	Wld. pipe	SA-691	CM-70	K12020	...	...	3 2
35	C- ¹ / ₂ Mo	Plate	SA-204	C	K12320	...	...	3 2
36	C- ¹ / ₂ Mo	Wld. pipe	SA-672	L75	K12320	...	...	3 2
37	C- ¹ / ₂ Mo	Wld. pipe	SA-691	CM-75	K12320	...	...	3 2
38	C- ¹ / ₂ Mo	Wld. pipe	SA-691	CM-75	K12320	...	...	3 2
39	¹ / ₂ Cr- ¹ / ₅ Mo	Forgings	SA-372	G	K13049	55	...	...
40	¹ / ₂ Cr- ¹ / ₅ Mo	Forgings	SA-372	H	K13547	55	...	...
41	¹ / ₂ Cr- ¹ / ₅ Mo	Forgings	SA-372	G	K13049	65	...	...
42	¹ / ₂ Cr- ¹ / ₅ Mo	Forgings	SA-372	H	K13547	65	...	...
43	¹ / ₂ Cr- ¹ / ₅ Mo	Forgings	SA-372	G	K13049	70	...	...
44	¹ / ₂ Cr- ¹ / ₅ Mo	Forgings	SA-372	H	K13547	70	...	...
45	¹ / ₂ Cr- ¹ / ₅ Mo-V	Plate	SA-517	B	K11630	...	≤1 ¹ / ₄	11B 4

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	80	70	NP	NP	NP	650	...	...
2	80	70	NP	NP	NP	650	...	...
3	90	80	NP	NP	NP	650	...	...
4	90	80	NP	NP	NP	650	...	...
5	71	30	NP	NP	650	NP	CS-6	G7
6	55	25	NP	NP	650	650	CS-1	...
7	65.5	37.5	1000	NP	1000	NP	CS-2	G11, S2, T4
8	65.5	39	1000	NP	1000	NP	CS-2	G11, S2, T4
9	65.5	40.5	1000	NP	1000	NP	CS-2	G11, S2, T4
10	53	28	1000	NP	1000	650	CS-1	G11, S3, T5
11	53	28	1000	NP	NP	NP	CS-1	G11, S2, T5, W13
12	53	28	1000	NP	1000	650	CS-1	G3, G11, G24, S2, T5
13	55	30	1000	NP	1000	650	CS-2	G11, S3, T4
14	55	30	1000	700	1000	650	CS-2	G11, T4, W14
15	55	30	1000	NP	NP	NP	CS-2	G11, S2, T4, W13
16	55	30	1000	NP	1000	650	CS-2	G3, G11, G24, S2, T4
17	55	30	1000	700	1000	650	CS-2	G11, S2, T4
18	55	30	1000	700	1000	650	CS-2	G11, S2, T4
19	60	32	1000	NP	1000	650	CS-2	G11, S3, T4
20	60	32	1000	NP	NP	NP	CS-2	G11, S2, T4, W13
21	60	32	1000	NP	1000	650	CS-2	G3, G11, G24, S2, T4
22	65	35	1000	700	1000	650	CS-2	G1, G11, G17, S2, T4
23	65	35	NP	700	650	650	CS-2	G1, G17
24	65	35	NP	700	NP	NP	CS-2	G17
25	65	37	1000	700	1000	650	CS-2	G11, S2, T4
26	65	37	NP	700	NP	NP	CS-2	G26, W10, W12
27	65	37	NP	700	NP	NP	CS-2	G26, W10, W12
28	65	37	NP	300 (Cl. 3 only)	NP	NP	CS-2	G27, W10, W12
29	70	40	1000	700	1000	650	CS-2	G11, S2, T4
30	70	40	1000	700	1000	650	CS-2	G11, S2, T4
31	70	40	1000	700	1000	650	CS-2	G11, S2, T4
32	70	40	NP	700	NP	NP	CS-2	G26, W10, W12
33	70	40	NP	700	NP	NP	CS-2	G26, W10, W12
34	70	40	NP	300 (Cl. 3 only)	NP	NP	CS-2	G27, W10, W12
35	75	43	1000	700	1000	650	CS-2	G11, S2, T4, W12
36	75	43	NP	700	NP	NP	CS-2	G26, W10, W12
37	75	43	NP	700	NP	NP	CS-2	G26, W10, W12
38	75	43	NP	300 (Cl. 3 only)	NP	NP	CS-2	G27, W10, W12
39	85	55	NP	NP	600	600	CS-3	W11
40	85	55	NP	NP	600	600	CS-3	W11
41	105	65	NP	NP	600	600	CS-3	W11
42	105	65	NP	NP	600	600	CS-3	W11
43	120	70	NP	NP	200	200	CS-3	W11
44	120	70	NP	NP	200	200	CS-3	W11
45	115	100	NP	650 (SPT)	650	650	HT-1	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	...	...	...	...	...
2	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	...	...	...	...	...
3	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	...	...	...	...	...
4	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	...	...	...	...	...
5	12.9	...	11.5	...	10.6	10.4	10.4	10.4	10.4	...	...	...	...	...
6	15.7	...	14.3	...	13.3	13.0	13.0	12.9	12.7	...	...	...	...	...
7	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.2	13.7
8	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.2	13.7
9	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.2	13.7
10	15.1	15.1	15.1	...	15.1	15.1	15.1	15.1	15.0	14.7	14.3	14.0	13.5	13.0
11	15.1	...	15.1	...	15.1	15.1	15.1	15.1	15.0	14.7	14.3	14.0	13.5	13.0
12	12.9	12.9	12.9	...	12.9	12.9	12.9	12.9	12.7	12.5	12.2	11.9	11.5	11.1
13	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.7
14	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.7
15	15.7	...	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.7
16	13.4	13.4	13.4	...	13.4	13.4	13.4	13.4	13.4	13.4	13.1	12.7	12.3	11.6
17	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.7
18	15.7	15.7	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.7
19	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	16.8	16.4	15.9	15.4	13.7
20	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	16.8	16.4	15.9	15.4	13.7
21	14.6	...	14.6	...	14.6	14.6	14.6	14.6	14.6	14.3	13.9	13.6	13.1	11.6
22	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.4	17.9	17.4	16.9	13.7
23	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.4	...	...	...	...
24	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.4	...	...	...	...
25	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.4	17.9	13.7
26	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...
27	18.6	...	18.6	...	18.6	18.6	18.6	18.6	18.6	18.6	...	...	...	...
28	18.6	...	18.6	...	18.6	...	...	...	...	...	...	...	...	...
29	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.3	13.7
30	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.3	13.7
31	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.3	13.7
32	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
33	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
34	20.0	...	20.0	...	20.0	...	...	...	...	...	...	...	...	...
35	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	20.7	13.7
36	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	...	...	...	...
37	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	...	...	...	...
38	21.4	...	21.4	...	21.4	...	...	...	...	...	...	...	...	...
39	24.3	...	24.3	...	24.3	24.3	24.3	24.3	...	...	...	...	...	...
40	24.3	...	24.3	...	24.3	24.3	24.3	24.3	...	...	...	...	...	...
41	30.0	...	30.0	...	30.0	30.0	30.0	30.0	...	...	...	...	...	...
42	30.0	...	30.0	...	30.0	30.0	30.0	30.0	...	...	...	...	...	...
43	34.3	...	34.3	...	...	...	...	...	...	...	...	...	...	...
44	34.3	...	34.3	...	...	...	...	...	...	...	...	...	...	...
45	32.9	...	32.9	32.9	32.9	32.9	32.9	32.9	32.8	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
8	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
10	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
11	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
12	7.0	4.1	...	...	...	...	...	...	...	...	...	...	...	...	...
13	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
14	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
15	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
16	7.0	4.1	...	...	...	...	...	...	...	...	...	...	...	...	...
17	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
18	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
19	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
20	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
21	7.0	4.1	...	...	...	...	...	...	...	...	...	...	...	...	...
22	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
30	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
31	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Plate	SA-517	A	K11856 ...		$\leq 1\frac{1}{4}$	11B	1
2	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Forgings	SA-592	A	K11856 ...		$\leq 2\frac{1}{2}$	11B	1
3	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P2	K11547 ...		...	3	1
4	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP2	K11547 ...		...	3	1
5	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143 1		...	3	1
6	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143 ...		...	3	1
7	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143 ...		...	3	1
8	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T2	K11547 ...		...	3	1
9	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T2	K11547 ...		...	3	1
10	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T2S1	K11547 ...		...	3	1
11	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP2	J11547 ...		...	3	1
12	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F2	K12122 ...		...	3	2
13	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143 2		...	3	2
14	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143 ...		...	3	2
15	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Ni-Cu	Smls. & wld. tube	SA-423	1	K11535 ...		...	4	2
16	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Ni-Cu	Wld. tube	SA-423	1	K11535 ...		...	4	2
17	$\frac{3}{4}$ Cr- $\frac{3}{4}$ Ni-Cu-Al	Pipe	SA-333	4	K11267 ...		...	4	2
18	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047 55		...	...	...
19	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350 55		...	...	...
20	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548 55		...	...	...
21	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047 65		...	...	...
22	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350 65		...	...	...
23	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548 65		...	...	...
24	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047 70		...	...	...
(23) 25	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350 70		...	...	...
26	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548 70		...	...	...
27	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	G41370 110		...	...	...
28	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757 1		...	4	1
29	1Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	1CR	K11757 ...		...	4	1
30	1Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP12	J11562 ...		...	4	1
31	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11562 1		...	4	1
32	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T12	K11562 ...		...	4	1
33	1Cr- $\frac{1}{2}$ Mo	Smls. & wld. fittings	SA-234	WP12	K12062 1		...	4	1
34	1Cr- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T12	K11562 ...		...	4	1
35	1Cr- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T12S1	K11562 ...		...	4	1
36	1Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P12	K11562 ...		...	4	1
37	1Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP12	K11562 ...		...	4	1
38	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$10 < t \leq 20$	4	1
39	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$6 < t \leq 10$	4	1
40	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$4 < t \leq 6$	4	1
41	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	NT	$4 < t \leq 8$	4	1
42	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$4 < t \leq 10$	4	1
43	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$2.5 < t \leq 4$	4	1
44	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$2.8 < t \leq 4$	4	1
45	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA/EN 10216-2	13CrMo4-5	...	...	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	4	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	115	100	NP	650 (SPT)	650	650	HT-1	...
2	115	100	NP	650 (SPT)	650	650	HT-1	...
3	55	30	1000	700	1000	650	CS-2	T5
4	55	30	1000	700	1000	650	CS-2	T5
5	55	33	1000	700	1000	650	CS-2	T5
6	55	33	NP	700	NP	NP	CS-2	G26, W10, W12
7	55	33	NP	300 (Cl. 3 only)	NP	NP	CS-2	G27, W10, W12
8	60	30	1000	700	1000	650	CS-2	T5
9	60	30	1000	NP	NP	NP	CS-2	G3, T5
10	60	30	1000	NP	NP	NP	CS-2	T5, W13
11	60	30	NP	700	NP	NP	CS-2	G17
12	70	40	1000	NP	1000	650	CS-2	T5
13	70	45	NP	700	1000	650	CS-3	T5
14	70	45	NP	700	NP	NP	CS-3	G26, W10, W12
15	60	37	700	NP	650	NP	CS-2	W13, W14
16	60	37	700	NP	650	NP	CS-2	G3, G24
17	60	35	NP	700	650	NP	CS-2	...
18	85	55	NP	NP	600	600	CS-3	W11
19	85	55	NP	NP	600	600	CS-3	W11
20	85	55	NP	NP	600	600	CS-3	W11
21	105	65	NP	NP	650	650	CS-2	W11
22	105	65	NP	NP	600	600	CS-3	W11
23	105	65	NP	NP	650	650	CS-2	W11
24	120	70	NP	NP	650	650	CS-5	W11
25	120	70	NP	NP	650	650	CS-5	W11
26	120	70	NP	NP	650	650	CS-5	W11
27	135	110	NP	NP	650	650	HT-1	W11
28	55	33	1200	700	1200	NP	CS-2	S4, T5
29	55	33	NP	700	NP	NP	CS-2	G26, W10, W12
30	60	30	NP	700	NP	NP	CS-2	G17
31	60	32	1200	NP	1200	NP	CS-2	T5
32	60	32	1200	700	1200	NP	CS-2	S4, T5
33	60	32	1200	700	1200	NP	CS-2	S4, T5, W14
34	60	32	1200	NP	NP	NP	CS-2	G3, S4, T5
35	60	32	1200	NP	NP	NP	CS-2	S4, T5, W13
36	60	32	1200	700	1200	NP	CS-2	S4, T5
37	60	32	1200	700	1200	NP	CS-2	S4, T5
38	61	35	1200	NP	1200	NP	CS-2	S4, T5
39	61	35.5	1200	NP	1200	NP	CS-2	S4, T5
40	62.5	37	1200	NP	1200	NP	CS-2	S4, T5
41	64	37	1200	NP	NP	NP	CS-2	S4, T5
42	64	38.5	1200	NP	1200	NP	CS-2	S4, T5
43	64	39	1200	NP	1200	NP	CS-2	S4, T5
44	64	40	1200	NP	1200	NP	CS-2	S4, T5
45	64	40.5	1200	NP	1200	NP	CS-2	T5

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	32.9	...	32.9	32.9	32.9	32.9	32.9	32.9	32.8	...	...	...	...	...
2	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.8	...	...	...	...	...
3	15.7	...	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.9
4	15.7	...	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.4	14.9	14.5	13.9
5	15.7	...	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.3	14.3
6	15.7	...	15.7	...	15.7	15.7	15.7	15.7	15.7	15.7	...	...	...	...
7	15.7	...	15.7	...	15.7	...	...	...	...	...	...	...	...	...
8	17.1	...	17.1	...	17.1	17.1	16.9	16.4	16.1	15.7	15.4	14.9	14.5	13.9
9	14.5	...	14.5	...	14.5	14.5	14.4	13.9	13.7	13.3	13.1	12.7	12.3	11.8
10	17.1	...	17.1	...	17.1	17.1	16.9	16.4	16.1	15.7	15.4	14.9	14.5	13.9
11	17.1	...	17.1	...	17.1	17.1	16.9	16.4	16.1	15.7	...	...	...	...
12	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.3	18.6
13	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.5	18.6
14	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
15	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...
16	14.6	...	14.6	...	14.6	14.6	14.6	14.6	14.6	14.6	...	...	...	...
17	17.1	17.1	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...
18	24.3	...	24.3	...	24.3	24.3	24.3	24.3	...	...	...	...	...	...
19	24.3	...	24.3	...	24.3	24.3	24.3	24.3	...	...	...	...	...	...
20	24.3	...	24.3	...	24.3	24.3	24.3	24.3	...	...	...	...	...	...
21	30.0	...	30.0	...	30.0	30.0	30.0	30.0	29.8	...	...	...	...	...
22	30.0	...	30.0	...	30.0	30.0	30.0	30.0	...	...	...	...	...	...
23	30.0	...	30.0	...	30.0	30.0	30.0	30.0	29.8	...	...	...	...	...
24	34.3	34.3	34.3	...	34.3	34.3	34.3	34.3	34.1	...	...	...	...	...
25	34.3	...	34.3	...	34.3	34.3	34.3	34.3	34.1	...	...	...	...	...
26	34.3	...	34.3	...	34.3	34.3	34.3	34.3	34.1	...	...	...	...	...
27	38.5	...	36.9	...	...	36.5	36.1	35.9	34.3	...	...	...	...	...
28	15.7	...	15.4	...	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	14.7
29	15.7	...	15.4	...	15.1	15.1	15.1	15.1	15.1	15.1	...	...	...	...
30	17.1	...	16.8	...	16.5	16.2	15.7	15.2	15.0	14.8	...	...	...	...
31	17.1	17.1	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
32	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
33	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
34	14.5	14.5	14.3	...	14.0	14.0	14.0	13.8	13.6	13.4	13.2	13.0	12.7	12.3
35	17.1	17.1	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
36	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
37	17.1	...	16.8	...	16.5	16.5	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
38	17.4	...	17.2	...	16.7	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.3	15.8
39	17.4	17.2	17.1	16.9	16.8	16.8	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1
40	17.8	17.7	17.5	17.3	17.2	17.2	17.1	17.1	17.1	17.1	17.1	17.1	17.0	16.7
41	18.2	...	17.9	...	17.6	17.6	17.1	16.6	16.4	16.1	15.9	15.5	15.2	14.8
42	18.2	...	18.0	...	17.5	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.3	16.9
43	18.2	18.1	17.9	17.7	17.6	17.6	17.5	17.5	17.5	17.5	17.5	17.5	17.4	17.1
44	18.2	...	18.0	...	17.5	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.3	16.9
45	18.2	...	18.2	...	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	17.7	17.0

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
4	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
5	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
9	7.8	5.0	...	...	...	...	...	...	...	...	...	...	...	...	...
10	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
13	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
32	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
33	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
34	9.6	6.1	3.8	2.4	1.5	0.94	...	...	...	...	...	...	...	...	...
35	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
36	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
37	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
38	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
39	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
40	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
41	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
42	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
43	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
44	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
45	11.3	7.2	4.5	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...

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Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	P-No.	Group
					Design/UNS No.	Condition/Temper			
1	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT	$1.4 < t \leq 2.8$	4	1
2	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA/EN 10216-2	13CrMo4-5	...	...	$t \leq 1\frac{5}{8}$	4	1
3	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT	$t \leq 1.4$	4	1
4	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	2	...	4	1
5	1Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	1CR	K11757	...	...	4	1
6	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	NT	$2.5 < t \leq 4$	4	1
7	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$\frac{5}{8} < t \leq 2.5$	4	1
8	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	NT	$0.25 \leq t \leq 2.5$	4	1
9	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$t \leq \frac{5}{8}$	4	1
10	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11564	2	...	4	1
11	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F12	K11564	...	...	4	1
12	1Cr-V	Smls. tube	SA-213	T17	K12047	...	...	10B	1
13	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC6	J12072	...	...	4	1
14	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP11	J12072	...	...	4	1
15	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Bar	SA-739	B11	K11797	...	...	4	1
16	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11597	1	...	4	1
17	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T11	K11597	...	...	4	1
18	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. & wld. fittings	SA-234	WP11	...	1	...	4	1
19	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. tube	SA-250	T11	K11597	...	...	4	1
20	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. tube	SA-250	T11S1	K11597	...	...	4	1
21	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P11	K11597	...	...	4	1
22	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11597	1	...	4	1
23	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forged pipe	SA-369	FP11	K11597	...	...	4	1
24	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	1	...	4	1
25	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...	...	4	1
26	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...	...	4	1
27	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11572	2	...	4	1
28	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	2	...	4	1
29	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	3	...	4	1
30	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	2	...	4	1
31	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...	...	4	1
32	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...	$2\frac{1}{2} < t \leq 4$	11B	2
33	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...	$\leq 2\frac{1}{2}$	11B	2
34	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...	$2\frac{1}{2} < t \leq 6$	11B	2
35	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...	$\leq 2\frac{1}{2}$	11B	2
36	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	1	...	5A	1
37	$2\frac{1}{4}$ Cr-1Mo	Smls. tube	SA-213	T22	K21590	...	...	5A	1
38	$2\frac{1}{4}$ Cr-1Mo	Smls. & wld. fittings	SA-234	WP22	K21590	1	...	5A	1
39	$2\frac{1}{4}$ Cr-1Mo	Wld. tube	SA-250	T22	K21590	...	...	5A	1
40	$2\frac{1}{4}$ Cr-1Mo	Wld. tube	SA-250	T22S1	K21590	...	...	5A	1
41	$2\frac{1}{4}$ Cr-1Mo	Smls. pipe	SA-335	P22	K21590	...	...	5A	1
42	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	1	...	5A	1
43	$2\frac{1}{4}$ Cr-1Mo	Forged pipe	SA-369	FP22	K21590	...	...	5A	1
44	$2\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	1	...	5A	1
45	$2\frac{1}{4}$ Cr-1Mo	Wld. pipe	SA-691	$2\frac{1}{4}$ CR	K21590	...	...	5A	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	64	41.5	1200	NP	1200	NP	CS-2	S4, T5
2	64	42	1200	NP	1200	NP	CS-2	T5
3	64	43	1200	NP	1200	NP	CS-2	S4, T5
4	65	40	1200	700	1200	NP	CS-2	S4, T5
5	65	40	NP	700	NP	NP	CS-2	G26, W10, W12
6	65.5	40	1200	NP	NP	NP	CS-2	S4, T5
7	65.5	42	1200	NP	1200	NP	CS-2	S4, T5
8	65.5	43	1200	NP	NP	NP	CS-2	S4, T5
9	65.5	43.5	1200	NP	1200	NP	CS-2	S4, T5
10	70	40	1200	700	1200	NP	CS-2	S4, T4
11	70	40	1200	700	1200	NP	CS-2	S4, T4
12	60	30	NP	NP	650	650	CS-2	...
13	70	40	1100	700	1100	NP	CS-2	G1, G17, T4
14	70	40	NP	700	NP	NP	CS-2	G17
15	70	45	NP	700	1200	NP	CS-3	T4
16	60	30	1200	NP	1200	NP	CS-2	S4, T5
17	60	30	1200	700	1200	NP	CS-2	S4, T5
18	60	30	1200	700	1200	NP	CS-2	S4, T5, W14
19	60	30	1200	NP	NP	NP	CS-2	G3, S4, T5
20	60	30	1200	NP	NP	NP	CS-2	S4, T5, W13
21	60	30	1200	700	1200	NP	CS-2	S4, T5
22	60	30	1200	NP	NP	NP	CS-2	S4, T5
23	60	30	1200	700	1200	NP	CS-2	S4, T5
24	60	35	1200	700	1200	NP	CS-2	S4, T4
25	60	35	NP	300 (Cl. 3 only)	NP	NP	CS-2	G27, W10, W12
26	60	35	NP	700	NP	NP	CS-2	G26, W10, W12
27	70	40	1200	700	1200	NP	CS-2	S4, T4
28	70	40	1200	NP	1200	NP	CS-2	S4, T4
29	75	45	NP	NP	1200	NP	CS-3	T3
30	75	45	1200	700	1200	NP	CS-3	S4, T3
31	75	45	NP	700	NP	NP	CS-3	G26, W10, W12
32	105	90	NP	650 (SPT)	650	650	CS-5	S7
33	115	100	NP	NP	650	650	HT-1	...
34	105	90	NP	700 (Cl. MC & SPT)	650	650	CS-5	...
35	115	100	NP	700 (Cl. MC & SPT)	650	650	HT-1	...
36	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9
37	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9
38	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9, W14
39	60	30	1200	NP	NP	NP	CS-2	G3, S4, T4, W9
40	60	30	1200	NP	NP	NP	CS-2	S4, T4, W9, W13
41	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9
42	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9
43	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9
44	60	30	1200	700	1200	NP	CS-2	S4, T4, W7, W9
45	60	30	NP	700	NP	NP	CS-2	G26, W10, W12

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	18.2	...	18.0	...	17.5	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.3	16.9
2	18.2	...	18.2	...	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	17.7	17.0
3	18.2	...	18.0	...	17.5	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.3	16.9
4	18.6	18.6	18.2	...	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.4
5	18.6	...	18.2	...	17.9	17.9	17.9	17.9	17.9	17.9	...	...	...	...
6	18.6	...	18.3	...	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1
7	18.6	18.5	18.3	18.1	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.8	17.5
8	18.6	...	18.3	...	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1
9	18.6	18.5	18.3	18.1	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.8	17.5
10	20.0	...	19.6	...	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.1	18.6	18.0
11	20.0	20.0	19.6	...	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.1	18.6	18.0
12	17.1	17.1	17.1	...	17.1	16.8	16.2	15.7	15.4	...	...	...	...	...
13	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	13.7
14	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
15	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.4	13.7
16	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
17	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
18	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
19	14.5	...	14.5	...	14.5	14.3	13.8	13.3	13.1	12.8	12.6	12.2	11.9	11.6
20	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
21	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
22	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
23	17.1	...	17.1	...	17.1	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
24	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	17.1	16.8	16.4	13.7
25	17.1	...	17.1	...	17.1	...	...	...	...	...	...	...	...	...
26	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	17.1	...	...	...	...
27	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	13.7
28	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.7	13.7
29	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	20.2	13.7
30	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	20.2	13.7
31	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	...	...	...	...
32	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	...	...	...	...	...
33	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.9	...	...	...	...	...
34	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	...	...	...	...
35	32.9	...	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.7	...	...	...	...
36	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
37	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
38	17.1	17.1	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
39	14.5	...	14.5	...	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	11.6
40	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
41	17.1	17.1	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
42	17.1	17.1	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
43	17.1	17.1	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
44	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	13.6
45	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
2	11.3	7.2	4.5	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
3	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
4	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
7	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
8	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
9	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
10	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
11	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
16	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
17	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
18	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
19	7.9	5.4	3.6	2.4	1.6	1.0	...	...	...	...	...	...	...	...	...
20	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
21	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
22	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
23	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
24	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
28	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
29	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
30	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
37	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
38	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
39	9.2	6.8	4.8	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
40	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
41	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
42	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
43	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
44	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design/UNS No.	Condition/ Temper		
1	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	6 < t ≤ 10	5A 1
2	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT or QT	8 < t ≤ 20	5A 1
3	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	4 < t ≤ 6	5A 1
4	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	2.5 < t ≤ 4	5A 1
5	2 $\frac{1}{4}$ Cr-1Mo	Smls. tube	SA/EN 10216-2	10CrMo9-10	...	...	1 $\frac{5}{8}$ < t ≤ 2 $\frac{1}{2}$	5A 1
6	2 $\frac{1}{4}$ Cr-1Mo	Smls. tube	SA/EN 10216-2	10CrMo9-10	...	...	t ≤ 1 $\frac{5}{8}$	5A 1
7	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	t ≤ 2.5	5A 1
8	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-217	WC9	J21890	...	...	5A 1
9	2 $\frac{1}{4}$ Cr-1Mo	Cast pipe	SA-426	CP22	J21890	...	...	5A 1
10	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	3	...	5A 1
11	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	3	...	5A 1
12	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	2	...	5A 1
13	2 $\frac{1}{4}$ Cr-1Mo	Wld. pipe	SA-691	2 $\frac{1}{4}$ CR	K21590	...	...	5A 1
14	2 $\frac{1}{4}$ Cr-1Mo	Bar	SA-739	B22	K21390	...	...	5A 1
15	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT	t ≤ 8	5A 1
16	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-487	8	J22091	A	...	5C 1
17	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-508	22	K21590	3	...	5C 1
18	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	3	...	5C 1
19	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-542	B	K21590	4	...	5C 1
20	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-182	F22V	K31835	...	...	5C 1
21	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-336	F22V	K31835	...	...	5C 1
22	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-541	22V	K31835	...	...	5C 1
23	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-542	D	K31835	4a	...	5C 1
24	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-832	22V	K31835	...	...	5C 1
25	3Cr-1Mo	Smls. tube	SA-213	T21	K31545	...	...	5A 1
26	3Cr-1Mo	Smls. pipe	SA-335	P21	K31545	...	...	5A 1
27	3Cr-1Mo	Forgings	SA-336	F21	K31545	1	...	5A 1
28	3Cr-1Mo	Forged pipe	SA-369	FP21	K31545	...	...	5A 1
29	3Cr-1Mo	Plate	SA-387	21	K31545	1	...	5A 1
30	3Cr-1Mo	Cast pipe	SA-426	CP21	J31545	...	...	5A 1
31	3Cr-1Mo	Forgings	SA-182	F21	K31545	...	...	5A 1
32	3Cr-1Mo	Forgings	SA-336	F21	K31545	3	...	5A 1
33	3Cr-1Mo	Plate	SA-387	21	K31545	2	...	5A 1
34	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-182	F3V	K31830	...	...	5C 1
35	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-336	F3V	K31830	...	...	5C 1
36	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-508	3V	K31830	...	...	5C 1
37	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-541	3V	K31830	...	...	5C 1
38	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-542	C	K31830	4a	...	5C 1
39	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-832	21V	K31830	...	...	5C 1
40	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-182	F3VCb	...	...	...	5C 1
41	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-336	F3VCb	...	...	...	5C 1
42	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-508	3VCb	...	...	...	5C 1
43	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-541	3VCb	...	...	...	5C 1
44	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-542	E	...	4a	...	5C 1
45	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-832	23V	...	...	...	5C 1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	65.5	36.5	1100	NP	1100	NP	CS-3	S4, T4, W7, W9
2	65.5	38.5	1200	NP	1200	NP	CS-3	S4, T5, W7, W9
3	66.5	37.5	1100	NP	1100	NP	CS-3	S4, T4, W7, W9
4	68	40.5	1100	NP	1100	NP	CS-3	S4, T4, W7, W9
5	69.5	39	1200	NP	1200	NP	CS-2	T4, W7, W9
6	69.5	40.5	1200	NP	1200	NP	CS-2	T4, W7, W9
7	69.5	...	1100	NP	1100	NP	CS-3	G18, S4, T4, W7, W9
8	70	40	1200	700	1200	NP	CS-2	G1, G17, S4, T4, W7, W9
9	70	40	NP	700	NP	NP	CS-2	G17
10	75	45	1200	700	1200	NP	CS-3	S4, T4, W7, W9
11	75	45	1200	700	1200	NP	CS-3	S4, T4, W7, W9
12	75	45	1200	700	1200	NP	CS-3	S4, T4, W7, W9
13	75	45	NP	700	NP	NP	CS-3	G26, W10, W12
14	75	45	NP	700	1200	NP	CS-3	T4, W7
15	75.5	45	1200	NP	1200	NP	CS-3	S4, T4, W7, W9
16	85	55	NP	NP	1000	NP	CS-3	G1, T4, W7
17	85	55	NP	NP	850	NP	CS-2	...
18	85	55	NP	NP	850	NP	CS-2	...
19	85	55	NP	NP	850	NP	CS-2	...
20	85	60	NP	NP	900	NP	CS-2	...
21	85	60	NP	NP	900	NP	CS-2	...
22	85	60	NP	NP	900	NP	CS-2	...
23	85	60	NP	NP	900	NP	CS-2	...
24	85	60	NP	NP	900	NP	CS-2	...
25	60	30	1200	700	1200	NP	CS-2	S4, T3
26	60	30	1200	700	1200	NP	CS-2	S4, T3
27	60	30	1200	700	1200	NP	CS-2	S4, T3
28	60	30	1200	700	1200	NP	CS-2	S4, T3
29	60	30	1200	700	1200	NP	CS-2	S4, T3
30	60	30	NP	700	NP	NP	CS-2	G17
31	75	45	1200	700	1200	NP	CS-3	S4, T3
32	75	45	1200	700	1200	NP	CS-3	S4, T3
33	75	45	1200	700	1200	NP	CS-3	S4, T3
34	85	60	NP	NP	900	NP	CS-3	...
35	85	60	NP	NP	900	NP	CS-3	...
36	85	60	NP	NP	900	NP	CS-3	...
37	85	60	NP	NP	900	NP	CS-3	...
38	85	60	NP	NP	900	NP	CS-3	...
39	85	60	NP	NP	900	NP	CS-3	...
40	85	60	NP	NP	900	NP	CS-3	...
41	85	60	NP	NP	900	NP	CS-3	...
42	85	60	NP	NP	900	NP	CS-3	...
43	85	60	NP	NP	900	NP	CS-3	...
44	85	60	NP	NP	900	NP	CS-3	...
45	85	60	NP	NP	900	NP	CS-3	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	18.6	...	18.6	...	18.2	18.0	17.9	17.7	17.6	17.4	17.2	16.8	16.3	15.8
2	18.6	...	18.6	...	18.3	18.0	17.9	17.8	17.7	17.5	17.3	16.9	16.3	15.7
3	19.1	...	19.1	...	18.6	18.4	18.3	18.1	18.0	17.8	17.5	17.2	16.7	15.8
4	19.5	...	19.5	...	19.0	18.8	18.7	18.5	18.4	18.2	17.9	17.5	17.0	15.8
5	19.9	...	19.9	...	19.4	19.2	19.1	18.9	18.8	18.6	18.3	17.9	17.4	15.8
6	19.9	...	19.9	...	19.4	19.2	19.1	18.9	18.8	18.6	18.3	17.9	17.4	15.8
7	19.9	...	19.9	...	19.4	19.2	19.1	18.9	18.8	18.6	18.3	17.9	17.4	15.8
8	20.0	...	20.0	...	19.7	19.4	19.3	19.2	19.1	18.8	18.5	17.9	17.2	15.8
9	20.0	...	20.0	...	19.7	19.4	19.3	19.2	19.1	18.8	...	...	...	...
10	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.7	15.8
11	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.7	15.8
12	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.7	15.8
13	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	...	...	...	...
14	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.7	15.8
15	21.5	...	21.5	...	21.1	20.8	20.7	20.6	20.5	20.3	19.9	19.5	18.9	15.8
16	24.3	24.3	24.3	...	23.7	23.5	23.5	23.3	23.2	22.9	22.4	21.7	20.8	15.8
17	24.3	...	24.3	...	24.3	24.3	23.8	23.3	23.1	22.9	22.6	21.9	20.4	...
18	24.3	...	24.3	...	24.3	24.3	23.8	23.3	23.1	22.9	22.6	21.9	20.4	...
19	24.3	...	24.3	...	24.3	24.3	23.8	23.3	23.1	22.9	22.6	21.9	20.4	...
20	24.3	...	24.3	...	24.3	24.3	24.3	23.7	23.2	22.8	22.2	21.6	21.0	20.3
21	24.3	...	24.3	...	24.3	24.3	24.3	23.7	23.2	22.8	22.2	21.6	21.0	20.3
22	24.3	...	24.3	...	24.3	24.3	24.3	23.7	23.2	22.8	22.2	21.6	21.0	20.3
23	24.3	...	24.3	...	24.3	24.3	24.3	23.7	23.2	22.8	22.2	21.6	21.0	20.3
24	24.3	...	24.3	...	24.3	24.3	24.3	23.7	23.2	22.8	22.2	21.6	21.0	20.3
25	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.0	12.0
26	17.1	17.1	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.0	12.0
27	17.1	17.1	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.0	12.0
28	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.0	12.0
29	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.0	12.0
30	17.1	...	17.1	...	16.6	16.6	16.6	16.6	16.6	16.6	...	...	...	...
31	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.1	13.1
32	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.1	13.1
33	21.4	...	21.4	...	20.9	20.6	20.5	20.4	20.2	20.0	19.7	19.3	18.1	13.1
34	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
35	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
36	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
37	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
38	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
39	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
40	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
41	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
42	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
43	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
44	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0
45	24.3	...	24.3	...	23.3	22.6	22.2	21.8	21.6	21.4	21.1	20.8	20.4	20.0

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...	...	...	...
2	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
3	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...	...	...	...
4	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...	...	...	...
5	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
6	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
7	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...	...	...	...
8	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
11	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
12	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
15	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...	...	...	...
16	11.4	7.8	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...	...	...	...
26	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...	...	...	...
27	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...	...	...	...
28	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...	...	...	...
29	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	9.5	6.8	4.9	3.2	2.4	1.3	...	...	...	...	...	...	...	...	...
32	9.5	6.8	4.9	3.2	2.4	1.3	...	...	...	...	...	...	...	...	...
33	9.5	6.8	4.9	3.2	2.4	1.3	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	5Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T5	K41545 ...	...	...	5B	1
2	5Cr- $\frac{1}{2}$ Mo	Smls. & wld. fittings	SA-234	WP5	K41545 ...	...	...	5B	1
3	5Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P5	K41545 ...	...	...	5B	1
4	5Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP5	K41545 ...	...	...	5B	1
5	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545 1	...	...	5B	1
6	5Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	5CR	K41545 ...	...	...	5B	1
7	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5	K41545 ...	...	...	5B	1
8	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5	K41545 ...	...	...	5B	1
9	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545 2	...	...	5B	1
10	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5A	K42544 ...	...	...	5B	1
11	5Cr- $\frac{1}{2}$ Mo	Castings	SA-217	C5	J42045 ...	...	...	5B	1
12	5Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP5	J42045 ...	...	...	5B	1
13	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5a	K42544 ...	...	...	5B	1
14	5Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T5b	K51545 ...	...	...	5B	1
15	5Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P5b	K51545 ...	...	...	5B	1
16	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. tube	SA-213	T5c	K41245 ...	...	...	5B	1
17	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. pipe	SA-335	P5c	K41245 ...	...	...	5B	1
18	9Cr-1Mo	Smls. tube	SA-213	T9	K90941 ...	...	...	5B	1
19	9Cr-1Mo	Fittings	SA-234	WP9	K90941 ...	...	...	5B	1
20	9Cr-1Mo	Smls. pipe	SA-335	P9	K90941 ...	...	...	5B	1
21	9Cr-1Mo	Forged pipe	SA-369	FP9	K90941 ...	...	...	5B	1
22	9Cr-1Mo	Forgings	SA-182	F9	K90941 ...	...	...	5B	1
23	9Cr-1Mo	Forgings	SA-336	F9	K90941 ...	...	...	5B	1
24	9Cr-1Mo	Castings	SA-217	C12	J82090 ...	...	...	5B	1
25	9Cr-1Mo	Cast pipe	SA-426	CP9	J82090 ...	...	...	5B	1
26	9Cr-1Mo-V	Smls. tube	SA-213	T91 Type 1	K90901 ...	...	...	15E	1
27	9Cr-1Mo-V	Fittings	SA-234	WP91 Type 1	K90901 ...	...	...	15E	1
28	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Type 1	K90901 ...	$t \leq 3$	...	15E	1
29	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Type 1	K90901 ...	$t > 3$	...	15E	1
30	9Cr-1Mo-V	Forged pipe	SA-369	FP91 Type 1	K90901 ...	...	...	15E	1
31	9Cr-1Mo-V	Plate	SA-387	91 Type 1	K90901 2	$t \leq 3$	...	15E	1
32	9Cr-1Mo-V	Plate	SA-387	91 Type 1	K90901 2	$t > 3$	...	15E	1
33	9Cr-1Mo-V	Forgings	SA-182	F91 Type 1	K90901 ...	$t \leq 3$	...	15E	1
34	9Cr-1Mo-V	Forgings	SA-182	F91 Type 1	K90901 ...	$t > 3$	...	15E	1
35	9Cr-1Mo-V	Forgings	SA-336	F91 Type 1	K90901 ...	...	...	15E	1
36	9Cr-1Mo-V	Smls. tube	SA-213	T91 Type 2	K90901 ...	...	...	15E	1
37	9Cr-1Mo-V	Fittings	SA-234	WP91 Type 2	K90901 ...	...	...	15E	1
38	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Type 2	K90901 ...	...	...	15E	1
39	9Cr-1Mo-V	Forged pipe	SA-369	FP91 Type 2	K90901 ...	...	...	15E	1
40	9Cr-1Mo-V	Plate	SA-387	91 Type 2	K90901 2	...	...	15E	1
41	9Cr-1Mo-V	Forgings	SA-182	F91 Type 2	K90901 ...	...	...	15E	1
42	9Cr-1Mo-V	Forgings	SA-336	F91 Type 2	K90901 ...	...	...	15E	1
43	11Cr-Ti	Plate	SA-240	...	S40910 ...	...	...	7	1
44	11Cr-Ti	Plate	SA-240	...	S40920 ...	...	...	7	1
45	11Cr-Ti	Plate	SA-240	...	S40930 ...	...	...	7	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	60	30	1200	700	1200	NP	CS-2	T4
2	60	30	1200	700	1200	NP	CS-2	T4, W14
3	60	30	1200	700	1200	NP	CS-2	T4
4	60	30	1200	700	1200	NP	CS-2	T4
5	60	30	1200	700	1200	NP	CS-2	T4
6	60	30	NP	700	NP	NP	CS-2	G26, W10, W12
7	60	36	1200	NP	1200	NP	CS-2	T4
8	70	40	1200	700	1200	NP	CS-2	T3
9	75	45	NP	700	1200	NP	CS-3	T3
10	80	50	1200	NP	1200	NP	CS-3	T3
11	90	60	1200	700	1200	NP	CS-3	G1, G17, T3
12	90	60	NP	700	NP	NP	CS-3	G17
13	90	65	1200	NP	1200	NP	CS-5	T3
14	60	30	1200	NP	1200	NP	CS-2	T4
15	60	30	1200	NP	1200	NP	CS-2	T4
16	60	30	1200	NP	1200	NP	CS-2	T4
17	60	30	1200	NP	1200	NP	CS-2	T4
18	60	30	1200	700	1200	NP	CS-2	T5
19	60	30	1200	NP	1200	NP	CS-2	T5
20	60	30	1200	700	1200	NP	CS-2	T5
21	60	30	1200	700	1200	NP	CS-2	T5
22	85	55	1200	NP	1200	NP	CS-3	T4
23	85	55	NP	NP	1200	NP	CS-3	T4
24	90	60	1200	700 (SPT)	1200	NP	CS-3	G1, T4
25	90	60	NP	700	NP	NP	CS-3	G17
26	85	60	1200	700	1200	NP	CS-3	T6
27	90	60	1200	NP	NP	NP	CS-3	T6
28	85	60	1200	700	1200	NP	CS-3	T6
29	85	60	1200	NP	1200	NP	CS-3	T6
30	85	60	1200	NP	NP	NP	CS-3	T6
31	85	60	1200	700	1200	NP	CS-3	T6
32	85	60	1200	NP	1200	NP	CS-3	T6
33	90	60	1200	700	1200	NP	CS-3	T6
34	90	60	1200	NP	1200	NP	CS-3	T6
35	90	60	1200	NP	1200	NP	CS-3	T6
36	85	60	1200	NP	NP	NP	CS-3	T7
37	90	60	1200	NP	NP	NP	CS-3	T6
38	85	60	1200	NP	NP	NP	CS-3	T7
39	85	60	1200	NP	NP	NP	CS-3	T7
40	85	60	1200	NP	NP	NP	CS-3	T7
41	90	60	1200	NP	NP	NP	CS-3	T6
42	90	60	1200	NP	NP	NP	CS-3	T6
43	55	25	NP	NP	800	NP	CS-1	...
44	55	25	NP	NP	800	NP	CS-1	...
45	55	25	NP	NP	800	NP	CS-1	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
2	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
3	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
4	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
5	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
6	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	...	...	...	...
7	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
8	20.0	...	20.0	...	19.4	19.2	19.2	18.9	18.6	18.2	17.6	17.0	14.3	10.9
9	21.4	...	21.4	...	20.8	20.6	20.5	20.2	19.9	19.5	18.9	18.2	14.3	10.9
10	22.9	...	22.8	...	22.1	22.0	21.9	21.6	21.3	20.8	20.2	19.1	14.3	10.9
11	25.7	...	25.7	...	24.9	24.7	24.6	24.3	23.9	23.4	22.7	19.1	14.3	10.9
12	25.7	...	25.7	...	24.9	24.7	24.6	24.3	23.9	23.4	...	...	...	...
13	25.7	...	25.7	...	24.9	24.7	24.6	24.3	23.9	23.4	22.7	19.1	14.3	10.9
14	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
15	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
16	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
17	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	10.9
18	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	13.0
19	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	13.0
20	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	13.0
21	17.1	...	17.1	...	16.6	16.5	16.4	16.2	15.9	15.6	15.1	14.5	13.8	13.0
22	24.3	...	24.2	...	23.5	23.4	23.3	22.9	22.6	22.1	21.4	20.6	19.6	16.4
23	24.3	...	24.2	...	23.5	23.4	23.3	22.9	22.6	22.1	21.4	20.6	19.6	16.4
24	25.7	...	25.7	...	24.9	24.7	24.6	24.3	23.9	23.4	22.7	21.8	20.8	16.4
25	25.7	...	25.7	...	24.9	24.7	24.6	24.3	23.9	23.4	...	...	...	...
26	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
27	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
28	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
29	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
30	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
31	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
32	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
33	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
34	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
35	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
36	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
37	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
38	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
39	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
40	24.3	...	24.3	...	24.3	24.2	24.1	23.7	23.4	22.9	22.2	21.3	20.3	19.1
41	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
42	25.7	...	25.7	...	25.7	25.6	25.5	25.1	24.7	24.2	23.5	22.6	21.5	20.2
43	15.7	...	14.5	...	13.1	12.1	11.6	11.3	11.3	11.3	11.2	11.1	...	...
44	15.7	...	14.5	...	13.1	12.1	11.6	11.3	11.3	11.3	11.2	11.1	...	...
45	15.7	...	14.5	...	13.1	12.1	11.6	11.3	11.3	11.3	11.2	11.1	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
2	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
3	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
4	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
5	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
8	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
9	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
10	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
11	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
14	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
15	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
16	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
17	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
18	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
19	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
20	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
21	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
22	11.0	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
23	11.0	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
24	11.0	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	17.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
27	18.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
28	17.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
29	17.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
30	17.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
31	17.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
32	17.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
33	18.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
34	18.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
35	18.8	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...	...	...	...
36	17.8	16.3	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
37	18.8	16.7	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
38	17.8	16.3	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
39	17.8	16.3	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
40	17.8	16.3	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
41	18.8	16.7	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
42	18.8	16.7	12.6	9.1	6.1	3.7	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	11Cr-Ti	Wld. tube	SA-268	TP409	S40900	...	...	7	1
2	11Cr-Ti	Smls. tube	SA-268	TP409	S40900	...	...	7	1
3	12Cr	Plate	SA-1010	40	S41003	...	$t \leq \frac{3}{4}$	7	1
4	12Cr	Bar	SA-479	403	S40300	A	...	6	1
5	12Cr	Bar	SA-479	403	S40300	1	...	6	1
6	12Cr	Plate	SA-1010	50	S41003	...	$t \leq \frac{3}{4}$	7	1
7	12Cr-Al	Plate	SA-240	405	S40500	...	...	7	1
8	12Cr-Al	Plate	SA-240	405	S40500	...	...	7	1
9	12Cr-Al	Bar	SA-479	405	S40500	...	...	7	1
10	12Cr-Al	Bar	SA/JIS G4303	SUS405	...	...	...	7	1
11	12Cr-Al	Smls. & wld. tube	SA-268	TP405	S40500	...	...	7	1
12	12Cr-Al	Wld. tube	SA-268	TP405	S40500	...	...	7	1
13	12Cr-Ti	Wld. tube	SA-268	...	S40800	...	...	7	1
14	12Cr-Ti	Smls. tube	SA-268	...	S40800	...	...	7	1
15	13Cr	Plate	SA-240	410S	S41008	...	...	7	1
16	13Cr	Smls. & wld. tube	SA-268	TP410	S41000	...	...	6	1
17	13Cr	Wld. tube	SA-268	TP410	S41000	...	...	6	1
18	13Cr	Plate	SA-240	410	S41000	...	...	6	1
19	13Cr	Forgings	SA-182	F6a	S41000	1	...	6	1
20	13Cr	Bar	SA-479	410	S41000	...	...	6	1
21	13Cr	Bar	SA-479	410	S41000	A	...	6	1
22	13Cr	Bar	SA-479	410	S41000	1	...	6	1
23	13Cr	Forgings	SA-182	F6a	S41000	2	...	6	3
24	13Cr	Castings	SA-217	CA15	J91150	...	...	6	3
25	13Cr	Cast pipe	SA-426	CPCA15	J91150	...	...	6	3
26	13Cr	Bar	SA/EN 10088-3	X12Cr13	...	QT650	$t \leq 6.25$	...	...
27	13Cr-4Ni	Castings	SA-487	CA6NM	J91540	A	...	6	4
28	13Cr-4Ni	Forgings	SA-182	F6NM	S41500	...	...	6	4
29	15Cr	Wld. tube	SA-268	TP429	S42900	...	...	6	2
30	15Cr	Smls. & wld. tube	SA-268	TP429	S42900	...	...	6	2
31	15Cr	Plate	SA-240	429	S42900	...	...	6	2
32	17Cr	Wld. tube	SA-268	TP430	S43000	...	...	7	2
33	17Cr	Smls. & wld. tube	SA-268	TP430	S43000	...	...	7	2
34	17Cr	Plate	SA-240	430	S43000	...	...	7	2
35	17Cr	Bar	SA-479	430	S43000	...	...	7	2
36	17Cr-4Ni-3Cu	Castings	SA-747	CB7Cu-1	J92180	...	...	...	...
37	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1150	...	...	...
38	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1150	...	...	...
39	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1150	...	...	...
40	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1100	...	...	...
41	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1100	...	...	...
42	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1100	...	...	...
43	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1075	...	...	...
44	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1075	...	...	...
45	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1075	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	55	25	NP	NP	800	650	CS-1	G24
2	55	25	NP	NP	800	650	CS-1	...
3	66	40	NP	NP	600	600	CS-2	...
4	70	40	NP	700	NP	NP	...	...
5	70	40	NP	700	NP	NP	...	...
6	70	50	NP	NP	600	600	CS-3	...
7	60	25	700	NP	1000	650	CS-1	G19, T5
8	60	25	NP	700	NP	NP	CS-1	G19
9	60	25	NP	700	1000	650	CS-1	G19, T5
10	60	25	NP	700	1000	NP	CS-1	G19, T5
11	60	30	700	NP	1000	650	CS-2	G19, T5, W13, W14
12	60	30	700	NP	1000	650	CS-2	G3, G19, G24, T5
13	55	30	NP	NP	800	650	CS-2	G19, W14
14	55	30	NP	NP	800	650	CS-2	G19
15	60	30	NP	700	1200	650	CS-2	T4
16	60	30	700	NP	1200	650	CS-2	T4, W13, W14
17	60	30	700	NP	1200	650	CS-2	G3, G24, T4
18	65	30	NP	NP	1200	650	CS-2	T4
19	70	40	NP	700	1000	650	CS-2	T4
20	70	40	NP	NP	1000	650	CS-2	G22, T4
21	70	40	NP	700	NP	NP	CS-2	...
22	70	40	700	700	NP	NP	CS-2	...
23	85	55	NP	700	1200	650	CS-3	T3
24	90	65	NP	700	1200	650	CS-5	G1, G17, T3
25	90	65	NP	700	NP	NP	CS-5	G17
26	94.5	65.5	NP	700 (SPT)	NP	NP	...	H3, W1
27	110	80	NP	700	800	650	CS-5	G1, G17
28	115	90	NP	700	NP	NP	CS-3	G17
29	60	35	700	NP	700	650	CS-2	G3, G19, W14
30	60	35	700	NP	1200	650	CS-2	G19, T4, W13, W14
31	65	30	NP	NP	1200	650	CS-2	G19, T4
32	60	35	700	NP	1200	650	CS-2	G3, G19, G24, T4
33	60	35	700	700	1200	650	CS-2	G19, T4, W12, W13, W14
34	65	30	NP	NP	1200	650	CS-2	G19, T4
35	70	40	700	700	1000	650	CS-2	G19, G22, T4
36	150	140	NP	NP	200	NP	HT-1	G1, G28, W1
37	135	105	NP	650	650	NP	HT-1	G8, G19, W1
38	135	105	NP	650	NP	NP	HT-1	G19, W1
39	135	105	NP	650	NP	NP	HT-1	G19, W1
40	140	115	NP	650	650	NP	HT-1	G8, G19, W1
41	140	115	NP	650	NP	NP	HT-1	G19, W1
42	140	115	NP	650	NP	NP	HT-1	G19, W1
43	145	125	NP	650	NP	NP	HT-1	G19, W1
44	145	125	NP	650	NP	NP	HT-1	G19, W1
45	145	125	NP	650	NP	NP	HT-1	G19, W1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	13.4	...	12.3	...	11.1	10.3	9.9	9.6	9.6	9.6	9.5	9.4	...	...
2	15.7	...	14.5	...	13.1	12.1	11.6	11.3	11.3	11.3	11.2	11.1	...	...
3	18.9	...	18.9	...	18.9	18.4	17.7	17.1	...	...	...	...	...	...
4	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	...	...	...	...
5	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	...	...	...	...
6	20.0	...	20.0	...	20.0	19.5	18.8	18.1	...	...	...	...	...	...
7	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	13.1	12.6	12.0	11.3
8	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	...	...	...	...
9	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	13.1	12.6	12.0	11.3
10	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	13.1	12.6	12.0	11.3
11	17.1	...	17.1	...	16.8	16.5	16.3	15.9	15.6	15.2	14.7	14.1	13.4	12.6
12	14.6	...	14.6	...	14.3	14.0	13.8	13.5	13.2	12.9	12.5	12.0	11.4	10.7
13	13.4	...	13.4	...	13.1	12.9	12.7	12.4	12.1	11.8	11.4	11.0	...	...
14	15.7	...	15.7	...	15.4	15.1	14.9	14.5	14.3	13.9	13.5	12.9	...	...
15	17.1	...	17.1	...	16.8	16.5	16.3	15.9	15.6	15.2	14.7	14.1	13.4	12.3
16	17.1	...	17.1	...	16.8	16.5	16.3	15.9	15.6	15.2	14.7	14.1	13.4	12.3
17	14.6	...	14.6	...	14.3	14.0	13.8	13.5	13.2	12.9	12.5	12.0	11.4	10.5
18	18.6	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	14.4	12.3
19	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	17.1	16.4	15.6	12.3
20	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	17.1	16.4	15.6	12.3
21	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	...	...	...	...
22	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	...	...	...	...
23	24.3	...	24.3	...	23.8	23.4	23.0	22.5	22.0	21.5	20.8	19.9	17.2	12.3
24	25.7	...	25.7	...	25.2	24.8	24.4	23.8	23.3	22.7	22.0	21.1	15.9	11.0
25	25.7	...	25.7	...	25.2	24.8	24.4	23.8	23.3	22.7	...	...	...	...
26	26.9	...	26.9	...	26.4	25.9	25.5	24.9	24.5	23.8	...	...	...	...
27	31.4	...	31.4	31.3	30.8	30.1	29.4	28.8	28.4	27.9	27.4	26.7	...	...
28	32.9	...	32.9	...	32.9	32.5	31.3	30.0	29.4	28.7	...	...	...	...
29	14.6	...	14.6	...	14.3	14.0	13.8	13.5	13.2	12.9	...	...	...	...
30	17.1	...	17.1	...	16.8	16.5	16.3	15.9	15.6	15.2	14.7	14.1	13.4	12.0
31	18.6	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	14.4	12.0
32	14.6	...	14.6	...	14.3	14.0	13.8	13.5	13.2	12.9	12.5	12.0	11.4	10.2
33	17.1	...	17.1	...	16.8	16.5	16.3	15.9	15.6	15.2	14.7	14.1	13.4	12.0
34	18.6	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	14.4	12.0
35	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	17.1	16.4	15.6	12.0
36	32.0	...	32.0	...	...	...	...	...	...	...	...	...	...	...
37	38.6	...	38.6	...	38.6	37.5	36.8	36.2	35.9	...	...	...	...	...
38	38.6	...	38.6	...	38.6	37.5	36.8	36.2	35.9	...	...	...	...	...
39	38.6	...	38.6	...	38.6	37.5	36.8	36.2	35.9	...	...	...	...	...
40	40.0	...	40.0	...	40.0	38.9	38.1	37.5	37.2	...	...	...	...	...
41	40.0	...	40.0	...	40.0	38.9	38.1	37.5	37.2	...	...	...	...	...
42	40.0	...	40.0	...	40.0	38.9	38.1	37.5	37.2	...	...	...	...	...
43	41.4	...	41.4	...	41.4	40.3	39.5	38.9	38.5	...	...	...	...	...
44	41.4	...	41.4	...	41.4	40.3	39.5	38.9	38.5	...	...	...	...	...
45	41.4	...	41.4	...	41.4	40.3	39.5	38.9	38.5	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	8.4	4.0	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	8.4	4.0	...	...	...	...	...	...	...	...	...	...	...	...	...
10	8.4	4.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	8.4	4.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	7.1	3.4	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
16	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
17	7.5	5.4	3.7	2.5	1.5	0.85	...	...	...	...	...	...	...	...	...
18	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
19	8.8	6.4	...	...	...	...	...	...	...	...	...	...	...	...	...
20	8.8	6.4	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...	...	...	...
24	7.6	5.0	3.3	2.2	1.5	1.0	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...	...	...	...
31	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...	...	...	...
32	7.8	5.5	3.8	2.7	2.0	1.5	...	...	...	...	...	...	...	...	...
33	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...	...	...	...
34	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...	...	...	...
35	9.2	6.5	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design./ UNS No.	Condition/ Temper		
(23)	18Cr-2Mo	Plate	SA-240	...	S44400	...	...	7 2
	18Cr-2Mo	Wld. tube	SA-268	...	S44400	...	...	7 2
	18Cr-2Mo	Smls. tube	SA-268	...	S44400	...	...	7 2
	18Cr-Ti	Plate	SA-240	...	S43932	...	...	7 2
	18Cr-Ti	Wld. tube	SA-268	TP439	S43035	...	...	7 2
	18Cr-Ti	Smls. tube	SA-268	TP439	S43035	...	...	7 2
	18Cr-Ti	Wld. pipe	SA-731	TP439	S43035	...	...	7 2
	18Cr-Ti	Smls. pipe	SA-731	TP439	S43035	...	...	7 2
	18Cr-Ti	Wld. tube	SA-803	TP439	S43035	...	...	7 2
	18Cr-Ti	Smls. tube	SA-268	TP430 Ti	S43036	...	...	7 2
	18Cr-Ti	Wld. tube	SA-268	TP430 Ti	S43036	...	...	7 2
	18Cr-Ti	Bar	SA-479	439	S43035	...	...	7 2
	26Cr-3Ni-3Mo	Plate	SA-240	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K 1
	26Cr-3Ni-3Mo	Smls. tube	SA-268	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K 1
	26Cr-3Ni-3Mo	Wld. tube	SA-268	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K 1
	26Cr-3Ni-3Mo	Wld. tube	SA-268	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K 1
	26Cr-3Ni-3Mo	Wld. tube	SA-803	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K 1
	27Cr	Smls. tube	SA-268	TP446-1	S44600	...	...	10I 1
	27Cr-1Mo	Forgings	SA-182	FXM-27Cb	S44627	...	...	10I 1
	27Cr-1Mo	Plate	SA-240	XM-27	S44627	...	...	10I 1
	27Cr-1Mo	Wld. tube	SA-268	TPXM-27	S44627	...	...	10I 1
	27Cr-1Mo	Smls. tube	SA-268	TPXM-27	S44627	...	...	10I 1
	27Cr-1Mo	Bar	SA-479	XM-27	S44627	...	...	10I 1
	27Cr-1Mo	Smls. pipe	SA-731	TPXM-27	S44627	...	...	10I 1
	27Cr-1Mo	Wld. pipe	SA-731	TPXM-27	S44627	...	...	10I 1
	27Cr-1Mo-Ti	Smls. pipe	SA-731	TPXM-33	S44626	...	...	10I 1
	27Cr-1Mo-Ti	Wld. pipe	SA-731	TPXM-33	S44626	...	...	10I 1
	27Cr-1Mo-Ti	Plate	SA-240	XM-33	S44626	...	...	10I 1
	27Cr-1Mo-Ti	Smls. tube	SA-268	TPXM-33	S44626	...	...	10I 1
	27Cr-1Mo-Ti	Wld. tube	SA-268	TPXM-33	S44626	...	...	10I 1
(23)	29Cr-4Mo	Bar	SA-479	...	S44700	...	...	10J 1
	29Cr-4Mo	Plate	SA-240	...	S44700	...	...	10J 1
	29Cr-4Mo	Smls. tube	SA-268	29-4	S44700	...	...	10J 1
	29Cr-4Mo	Wld. tube	SA-268	29-4	S44700	...	...	10J 1
	29Cr-4Mo-2Ni	Bar	SA-479	...	S44800	...	...	10K 1
	29Cr-4Mo-2Ni	Plate	SA-240	...	S44800	...	...	10K 1
	29Cr-4Mo-2Ni	Smls. tube	SA-268	29-4-2	S44800	...	...	10K 1
	29Cr-4Mo-2Ni	Wld. tube	SA-268	29-4-2	S44800	...	...	10K 1
	29Cr-4Mo-Ti	Smls. tube	SA-268	...	S44735	...	...	10J 1
	29Cr-4Mo-Ti	Wld. tube	SA-268	...	S44735	...	...	10J 1
	Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	...	...	...
	Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	A	...	3 3
	Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	B	...	3 3
	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	A	K12021	...	...	3 2
	Mn- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	H75	K12021	...	...	3 2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	60	40	NP	NP	650	650	CS-2	G19
2	60	40	NP	NP	650	650	CS-2	G19, G24
3	60	40	NP	NP	650	650	CS-2	G19
4	60	30	NP	NP	600	600	CS-2	G19
5	60	30	800	NP	800	650	CS-2	G19, G24
6	60	30	800	NP	800	650	CS-2	G19
7	60	30	800	NP	NP	NP	CS-2	G19, G24
8	60	30	800	NP	NP	NP	CS-2	G19
9	60	30	NP	NP	600	600	CS-2	G19, G24
10	60	35	NP	NP	800	NP	CS-2	G19
11	60	35	NP	NP	800	NP	CS-2	G19, G24
12	70	40	NP	NP	1000	650	CS-2	G19, G22, T4
13	85	65	NP	NP	700	650	HA-5	G19
14	85	65	NP	700	700	650	HA-5	G19, H5
15	85	65	NP	700	NP	NP	HA-5	G19, H5, W12
16	85	65	NP	NP	700	650	HA-5	G19, G24
17	85	65	NP	NP	600	600	HA-5	G19, G24
18	70	40	700	NP	650	650	CS-2	G19
19	60	35	NP	NP	650	650	HA-2	G19
20	65	40	NP	650	650	650	HA-2	G19
21	65	40	NP	NP	650	650	HA-2	G19, G24
22	65	40	NP	650	650	650	HA-2	G19
23	65	40	NP	700	650	650	HA-2	G19, G22
24	65	40	NP	NP	650	650	HA-2	G19
25	65	40	NP	NP	650	650	HA-2	G19, G24
26	65	40	NP	NP	650	650	HA-2	G19
27	65	40	NP	NP	650	650	HA-2	G19, G24
28	68	45	NP	NP	650	650	HA-6	G19
29	68	45	NP	NP	650	650	HA-6	G19
30	68	45	NP	NP	650	650	HA-6	G19, G24
31	70	55	NP	NP	600	600	HA-6	G19, G22
32	80	60	NP	NP	600	600	HA-6	G19
33	80	60	NP	NP	600	600	HA-6	G19
34	80	60	NP	NP	600	600	HA-6	G19, G24
35	70	55	NP	NP	600	600	HA-6	G19, G22
36	80	60	NP	NP	600	600	HA-6	G19
37	80	60	NP	NP	600	600	HA-6	G19
38	80	60	NP	NP	600	600	HA-6	G19, G24
39	75	60	NP	NP	600	600	HA-6	G19
40	75	60	NP	NP	600	600	HA-6	G19, G24
41	105	65	NP	650	650	650	CS-5	G25, W2, W11
42	85	53	NP	700 (SPT)	650	650	CS-3	G1
43	90	65	NP	NP	650	650	CS-5	G1
44	75	45	1000	700	1000	650	CS-3	G11, S2, T3
45	75	45	NP	700	NP	NP	CS-3	S6, W10, W12

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	17.1	...	17.1	...	16.6	16.2	15.9	15.4	15.1	...	...	...	...	...
2	14.6	...	14.6	...	14.1	13.8	13.5	13.1	12.8	...	...	...	...	...
3	17.1	...	17.1	...	16.6	16.2	15.9	15.4	15.1	...	...	...	...	...
4	17.1	...	17.1	...	15.7	14.6	13.9	13.6	...	...	...	...	...	...
5	14.6	...	14.6	...	13.3	12.4	11.8	11.6	11.5	11.5	11.4	11.2	...	...
6	17.1	...	17.1	...	15.7	14.6	13.9	13.6	13.6	13.5	13.4	13.2	...	...
7	14.6	...	14.6	...	13.3	12.4	11.8	11.6	11.5	11.5	11.4	11.2	...	...
8	17.1	...	17.1	...	15.7	14.6	13.9	13.6	13.6	13.5	13.4	13.2	...	...
9	14.6	...	14.6	...	13.3	12.4	11.8	11.6	...	...	...	...	...	...
10	17.1	...	17.1	...	16.6	16.1	15.8	15.4	15.1	14.8	14.5	14.0	...	...
11	14.6	...	14.6	...	14.1	13.7	13.4	13.1	12.9	12.6	12.3	11.9	...	...
12	20.0	...	20.0	...	19.3	18.8	18.4	17.9	17.7	17.3	16.9	16.4	15.8	12.2
13	24.3	...	24.3	...	24.2	23.9	23.8	23.6	23.5	23.4	...	...	...	...
14	24.3	...	24.3	...	24.2	23.9	23.8	23.6	23.5	23.4	...	...	...	...
15	24.3	...	24.3	...	24.2	23.9	23.8	23.6	23.5	23.4	...	...	...	...
16	20.6	...	20.6	...	20.6	20.3	20.2	20.1	20.0	19.9	...	...	...	...
17	20.6	...	20.6	...	20.6	20.3	20.2	20.1	...	...	...	...	...	...
18	20.0	...	20.0	...	19.3	18.8	18.4	17.9	17.7	17.3	...	...	...	...
19	17.1	...	17.1	...	16.6	16.1	16.1	16.1	16.1	...	...	...	...	...
20	18.6	...	18.6	...	18.3	18.1	18.1	18.1	18.1	...	...	...	...	...
21	15.8	...	15.8	...	15.5	15.4	15.4	15.4	15.4	...	...	...	...	...
22	18.6	...	18.6	...	18.3	18.1	18.1	18.1	18.1	...	...	...	...	...
23	18.6	...	18.6	...	18.3	18.1	18.1	18.1	18.1	18.1	...	...	...	...
24	18.6	...	18.6	...	18.3	18.1	18.1	18.1	18.1	...	...	...	...	...
25	15.8	...	15.8	...	15.5	15.4	15.4	15.4	15.4	...	...	...	...	...
26	18.6	...	18.6	...	18.4	18.2	18.0	17.6	17.3	...	...	...	...	...
27	15.8	...	15.8	...	15.7	15.4	15.3	15.0	14.7	...	...	...	...	...
28	19.4	...	19.4	...	19.3	19.0	18.8	18.4	18.1	...	...	...	...	...
29	19.4	...	19.4	...	19.3	19.0	18.8	18.4	18.1	...	...	...	...	...
30	16.5	...	16.5	...	16.4	16.2	16.0	15.7	15.4	...	...	...	...	...
31	20.0	...	20.0	...	19.3	19.2	19.2	19.2	...	...	...	...	...	...
32	22.9	...	22.8	...	22.1	21.9	21.9	21.9	...	...	...	...	...	...
33	22.9	...	22.8	...	22.1	21.9	21.9	21.9	...	...	...	...	...	...
34	19.4	...	19.4	...	18.8	18.6	18.6	18.6	...	...	...	...	...	...
35	20.0	...	19.6	...	19.3	19.2	18.9	18.6	...	...	...	...	...	...
36	22.9	...	22.4	...	22.1	21.9	21.6	21.3	...	...	...	...	...	...
37	22.9	...	22.4	...	22.1	21.9	21.6	21.3	...	...	...	...	...	...
38	19.4	...	19.1	...	18.8	18.6	18.4	18.1	...	...	...	...	...	...
39	21.4	...	21.0	...	20.7	20.5	20.3	20.0	...	...	...	...	...	...
40	18.2	...	17.9	...	17.6	17.5	17.2	17.0	...	...	...	...	...	...
41	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...	...
42	24.3	...	24.3	...	24.3	24.2	24.2	24.2	24.1	24.1	...	...	...	...
43	25.7	...	25.7	...	25.7	25.6	25.6	25.6	25.6	...	...	...	...	...
44	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	20.0	13.7
45	21.4	...	21.4	...	21.4	21.4	21.4	21.4	21.4	21.4	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	9.2	6.5	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design./ UNS No.	Condition/ Temper		
1	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	B	K12022 ...	...	3	3
2	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521 1	...	3	3
3	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521 2	...	3	3
4	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521 3	...	11A	4
5	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529 1	...	3	3
6	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529 2	...	3	3
7	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529 3	...	11A	4
8	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-302	C	K12039 ...	...	3	3
9	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539 1	...	3	3
10	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	H80	K12039 ...	...	3	3
11	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J80	K12539 ...	...	3	3
12	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539 2	...	3	3
13	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J90	K12539 ...	...	3	3
14	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539 3	...	11A	4
15	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J100	K12539 ...	...	11A	4
16	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-302	D	K12054 ...	...	3	3
17	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554 1	...	3	3
18	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554 1	...	3	3
19	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554 2	...	3	3
20	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554 2	...	3	3
21	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554 3	...	11A	4
22	Mn- $\frac{1}{2}$ Ni-V	Plate	SA-225	C	K12524 ...	...	10A	1
23	Mn-V	Castings	SA-487	1	J13002 A	...	10A	1
24	Mn-V	Castings	SA-487	1	J13002 A	...	10A	1
25	Mn-V	Castings	SA-487	1	J13002 B	...	10A	1
26	$1\frac{1}{2}$ Si- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P15	K11578 ...	...	3	1
27	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047 A	...	3	3
28	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047 B	...	11A	3
29	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047 E	...	11A	3
30	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045 1	...	3	3
31	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045 2	...	3	3
32	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576 ...	$2\frac{1}{2} < t \leq 4$	11B	3
33	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Plate	SA-517	F	K11576 ...	$\leq 2\frac{1}{2}$	11B	3
34	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576 ...	$\leq 2\frac{1}{2}$	11B	3
35	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cu-Mo	Smls. & wld. tube	SA-423	2	K11540 ...	...	4	2
36	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cu-Mo	Wld. tube	SA-423	2	K11540 ...	...	4	2
37	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766 1	...	3	3
38	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765 1	...	3	3
39	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766 2	...	3	3
40	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765 2	...	3	3
41	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042 1	...	3	3
42	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042 2	...	3	3
43	$\frac{3}{4}$ Ni-1Mo- $\frac{3}{4}$ Cr	Castings	SA-217	WC5	J22000 ...	...	4	1
44	$1\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC4	J12082 ...	...	4	1
45	$1\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650 ...	$2\frac{1}{2} < t \leq 4$	11B	8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	80	50	1000	700	1000	650	CS-3	G11, S2, T3
2	80	50	NP	700	1000	NP	CS-5	G23, T4
3	90	70	NP	700	800	NP	CS-5	...
4	100	83	NP	700	NP	NP	CS-5	...
5	80	50	NP	700	NP	NP	CS-5	...
6	90	70	NP	700	800	NP	CS-5	...
7	100	83	NP	700	750	650	CS-5	...
8	80	50	1000	700	1000	650	CS-3	G11, S2, T3
9	80	50	NP	700	800	NP	CS-5	G23
10	80	50	NP	700	NP	NP	CS-3	G26, W10, W12
11	80	50	NP	700	NP	NP	CS-5	G26, W10, W12
12	90	70	NP	700	800	NP	CS-5	...
13	90	70	NP	700	NP	NP	CS-5	G26, W10, W12
14	100	83	NP	700	750	650	CS-5	...
15	100	83	NP	700	NP	NP	CS-5	G26, W10, W12
16	80	50	1000	700	1000	650	CS-3	G11, S2, T3
17	80	50	NP	700	800	NP	CS-5	G23
18	80	50	NP	NP	800	NP	CS-5	G23
19	90	70	NP	700	800	NP	CS-5	...
20	90	70	NP	NP	800	NP	CS-5	...
21	100	83	NP	700	NP	NP	CS-5	...
22	105	70	NP	NP	700	650	CS-5	...
23	85	55	NP	700 (SPT)	NP	NP	CS-3	...
24	85	55	NP	NP	650	650	CS-3	G1
25	90	65	NP	NP	650	650	CS-5	G1
26	60	30	NP	NP	1000	650	CS-2	T3
27	90	60	NP	650	650	650	CS-3	G1
28	105	85	NP	NP	700	650	CS-5	G1
29	115	95	NP	NP	700	650	CS-5	G1
30	80	50	NP	700	800	650	CS-5	G23
31	90	65	NP	700	700	NP	CS-5	...
32	105	90	NP	650 (SPT)	650	650	CS-5	S7
33	115	100	NP	650 (SPT)	650	650	HT-1	...
34	115	100	NP	NP	650	650	HT-1	...
35	60	37	650	NP	650	NP	CS-2	W13, W14
36	60	37	650	NP	650	NP	CS-2	G3, G24
37	80	50	NP	700	800	650	CS-5	G23
38	80	50	NP	700	800	650	CS-5	G23
39	90	65	NP	700	700	NP	CS-5	...
40	90	65	NP	700	700	NP	CS-5	...
41	80	50	NP	700	800	650	CS-5	G23
42	90	65	NP	700	700	NP	CS-5	...
43	70	40	1100	700	1100	NP	CS-2	G1, G17, T4
44	70	40	1000	700	1000	NP	CS-2	G1, G17, T4
45	105	90	NP	700 (SPT)	650	650	CS-5	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	20.0	13.7
2	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.1	13.3
3	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	...	...
4	28.6	...	28.6	...	28.6	28.6	28.6	28.6	28.6	28.6	...	...	...	...
5	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	...	...	...	...
6	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	...	...
7	28.6	...	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	...	...
8	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	20.0	13.7
9	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
10	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	...	...	...	...
11	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	...	...	...	...
12	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	...	...
13	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	...	...	...	...
14	28.6	...	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	...	...	...
15	28.6	...	28.6	...	28.6	28.6	28.6	28.6	28.6	28.6	...	...	...	...
16	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	20.0	13.7
17	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
18	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
19	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	...	...
20	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	...	...
21	28.6	...	28.6	...	28.6	28.6	28.6	28.6	28.6	28.6	...	...	...	...
22	30.0	30.0	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
23	24.3	...	23.0	...	22.4	22.4	22.4	21.9	21.5	20.9	...	...	...	...
24	24.3	...	23.1	...	22.5	22.5	22.5	21.9	21.5	...	...	...	...	...
25	25.7	...	24.6	...	24.2	24.1	24.1	23.9	23.4	...	...	...	...	...
26	17.1	17.1	17.1	...	17.1	17.1	17.1	16.8	16.6	16.3	15.9	15.4	13.8	12.5
27	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	25.7	...	...	...	...	...
28	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
29	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	...	...	...	...
30	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
31	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	...	...	...	...
32	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	...	...	...	...	...
33	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.8	...	...	...	...	...
34	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.8	...	...	...	...	...
35	17.1	...	17.1	...	17.1	17.1	17.1	17.1	17.1	...	...	...	...	...
36	14.6	...	14.6	...	14.6	14.6	14.6	14.6	14.6	...	...	...	...	...
37	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
38	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
39	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	...	...	...	...
40	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	...	...	...	...
41	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	...	...
42	25.7	...	25.7	...	25.7	25.7	25.7	25.7	25.7	25.7	...	...	...	...
43	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	16.3
44	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	15.0
45	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.4	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
2	10.0	6.3	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	8.2	4.8	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	10.0	6.3	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	11.0	6.9	4.6	2.8	...	...	...	...	...	...	...	...	...	...	...
44	9.2	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	1 $\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650 ...		$\leq 2\frac{1}{2}$	11B	8
2	1 $\frac{1}{2}$ Ni	Forgings	SA-350	LF5	K13050 1		...	9A	1
3	1 $\frac{1}{2}$ Ni	Forgings	SA-350	LF5	K13050 2		...	9A	1
4	1 $\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr-Mo	Forgings	SA-372	L	K24055 ...		...	...	...
5	2Ni-1Cu	Forgings	SA-182	FR	K22035 ...		...	9A	1
6	2Ni-1Cu	Fittings	SA-234	WPR	K22035 ...		...	9A	1
7	2Ni-1Cu	Pipe	SA-333	9	K22035 ...		...	9A	1
8	2Ni-1Cu	Smls. pipe	SA-333	9	K22035 ...		...	9A	1
9	2Ni-1Cu	Wld. pipe	SA-333	9	K22035 ...		...	9A	1
10	2Ni-1Cu	Tube	SA-334	9	K22035 ...		...	9A	1
11	2Ni-1Cu	Forgings	SA-350	LF9	K22036 ...		...	9A	1
12	2Ni-1Cu	Smls. & wld. fittings	SA-420	WPL9	K22035 ...		...	9A	1
13	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550 1		...	...	...
14	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550 2		...	...	...
15	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550 3		...	...	...
16	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550 4		...	...	...
17	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550 5		...	...	...
18	2 $\frac{1}{2}$ Ni	Pipe	SA-333	7	K21903 ...		...	9A	1
19	2 $\frac{1}{2}$ Ni	Wld. pipe	SA-333	7	K21903 ...		...	9A	1
20	2 $\frac{1}{2}$ Ni	Tube	SA-334	7	K21903 ...		...	9A	1
21	2 $\frac{1}{2}$ Ni	Wld. tube	SA-334	7	K21903 ...		...	9A	1
22	2 $\frac{1}{2}$ Ni	Plate	SA-203	A	K21703 ...		...	9A	1
23	2 $\frac{1}{2}$ Ni	Plate	SA-203	B	K22103 ...		...	9A	1
24	2 $\frac{1}{2}$ Ni	Castings	SA-352	LC2	J22500 ...		...	9A	1
25	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	... 3		...	3	3
26	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	... 1		...	11A	5
27	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	... 2		...	11B	10
28	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035 1		...	...	...
29	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035 2		...	...	...
30	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035 3		...	...	...
31	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035 4		...	...	...
32	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035 5		...	...	...
33	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339 3		...	3	3
34	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	M	K42365 85		...	...	...
35	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339 1		...	11A	5
36	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339 2		...	11B	10
37	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	M	K42365 100		...	...	...
38	3 $\frac{1}{2}$ Ni	Pipe	SA-333	3	K31918 ...		...	9B	1
39	3 $\frac{1}{2}$ Ni	Wld. pipe	SA-333	3	K31918 ...		...	9B	1
40	3 $\frac{1}{2}$ Ni	Tube	SA-334	3	K31918 ...		...	9B	1
41	3 $\frac{1}{2}$ Ni	Wld. tube	SA-334	3	K31918 ...		...	9B	1
42	3 $\frac{1}{2}$ Ni	Fittings	SA-420	WPL3	...		...	9B	1
43	3 $\frac{1}{2}$ Ni	Plate	SA-203	D	K31718 ...		...	9B	1
44	3 $\frac{1}{2}$ Ni	Forgings	SA-350	LF3	K32025 1		...	9B	1
45	3 $\frac{1}{2}$ Ni	Forgings	SA-350	LF3	K32025 2		...	9B	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	115	100	NP	650 (SPT)	650	650	HT-1	...
2	60	30	NP	NP	500	500	CS-2	...
3	70	37.5	NP	NP	500	500	CS-2	...
4	155	135	NP	NP	650	650	...	W11
5	63	46	NP	NP	100	100	CS-3	...
6	63	46	NP	NP	100	NP	CS-3	...
7	63	46	NP	NP	100	100	CS-3	...
8	63	46	NP	100	NP	NP	CS-3	...
9	63	46	NP	NP	100	100	CS-3	G24
10	63	46	NP	NP	100	100	CS-3	...
11	63	46	NP	NP	100	100	CS-3	...
12	63	46	NP	100	100	100	CS-3	W14
13	115	100	NP	700 (SPT)	NP	NP	HT-1	W1
14	135	120	NP	700 (SPT)	NP	NP	HT-1	W1
15	155	140	NP	700 (SPT)	NP	NP	HT-1	W1
16	175	160	NP	700 (SPT)	NP	NP	HT-1	W1
17	190	180	NP	700 (SPT)	NP	NP	HT-1	W1
18	65	35	NP	NP	650	650	CS-2	...
19	65	35	NP	NP	650	650	CS-2	G24
20	65	35	NP	NP	650	650	CS-2	...
21	65	35	NP	NP	650	650	CS-2	G24
22	65	37	NP	700	1000	650	CS-2	T2
23	70	40	NP	650	1000	650	CS-2	T2
24	70	40	NP	100	650	650	CS-2	G1
25	90	70	NP	NP	650	NP	CS-5	...
26	105	85	NP	NP	650	NP	CS-5	...
27	115	100	NP	NP	650	NP	HT-1	...
28	115	100	NP	700 (SPT)	NP	NP	HT-1	W1
29	135	120	NP	700 (SPT)	NP	NP	HT-1	W1
30	155	140	NP	700 (SPT)	NP	NP	HT-1	W1
31	175	160	NP	700 (SPT)	NP	NP	HT-1	W1
32	190	180	NP	700 (SPT)	NP	NP	HT-1	W1
33	90	70	NP	NP	650	NP	CS-5	...
34	105	85	NP	NP	650	650	...	W11
35	105	85	NP	NP	650	NP	CS-5	...
36	115	100	NP	NP	650	NP	HT-1	...
37	120	100	NP	NP	650	650	...	W11
38	65	35	NP	NP	650	650	CS-2	...
39	65	35	NP	NP	650	650	CS-2	G24
40	65	35	NP	NP	650	650	CS-2	...
41	65	35	NP	NP	650	650	CS-2	G24
42	65	35	NP	NP	650	650	CS-2	...
43	65	37	NP	700	1000	650	CS-2	T2
44	70	37.5	NP	650	650	650	CS-2	...
45	70	37.5	NP	650	650	650	CS-2	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	32.9	...	32.9	32.9	32.9	32.9	32.9	32.9	32.8	...	...	...	...	...
2	17.1	...	16.5	...	15.7	15.3	15.3	...	...	...	...	...	...	...
3	20.0	...	19.2	...	18.3	17.8	17.8	...	...	...	...	...	...	...
4	44.3	...	44.3	...	44.3	44.3	44.3	44.1	42.9	...	...	...	...	...
5	18.1	...	...	...	...	...	...	...	...	...	...	...	...	...
6	18.1	...	...	...	...	...	...	...	...	...	...	...	...	...
7	18.1	...	...	...	...	...	...	...	...	...	...	...	...	...
8	17.9	...	...	...	...	...	...	...	...	...	...	...	...	...
9	15.3	...	...	...	...	...	...	...	...	...	...	...	...	...
10	18.1	...	...	...	...	...	...	...	...	...	...	...	...	...
11	18.1	...	...	...	...	...	...	...	...	...	...	...	...	...
12	18.1	...	...	...	...	...	...	...	...	...	...	...	...	...
13	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.4	31.6	...	...	...	...
14	38.6	...	38.6	...	38.6	38.6	38.6	38.6	38.0	37.1	...	...	...	...
15	44.3	...	44.3	...	44.3	44.3	44.3	44.3	43.6	42.6	...	...	...	...
16	50.0	...	50.0	...	50.0	50.0	50.0	50.0	49.2	48.0	...	...	...	...
17	54.3	...	54.3	...	54.3	54.3	54.3	54.3	53.5	52.2	...	...	...	...
18	18.6	18.6	18.6	...	18.6	18.6	18.6	17.5	16.7	...	...	...	...	...
19	15.8	...	15.8	...	15.8	15.8	15.8	14.9	14.2	...	...	...	...	...
20	18.6	18.6	18.6	...	18.6	18.6	18.6	17.5	16.7	...	...	...	...	...
21	15.8	15.8	15.8	...	15.8	15.8	15.8	14.9	14.2	...	...	...	...	...
22	18.6	18.6	18.6	...	18.6	18.6	18.6	18.5	17.6	16.6	13.9	11.4	9.0	6.5
23	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.0	18.0	14.8	12.0	9.3	6.5
24	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.0	...	...	...	...	...
25	25.7	...	25.7	25.7	25.7	25.7	25.3	25.0	24.6	...	...	...	...	...
26	30.0	...	30.0	30.0	30.0	29.7	29.5	29.1	28.7	...	...	...	...	...
27	32.9	...	32.9	32.9	32.9	32.5	32.3	31.9	31.5	...	...	...	...	...
28	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.4	31.6	...	...	...	...
29	38.6	...	38.6	...	38.6	38.6	38.6	38.6	38.0	37.1	...	...	...	...
30	44.3	...	44.3	...	44.3	44.3	44.3	44.3	43.6	42.6	...	...	...	...
31	50.0	...	50.0	...	50.0	50.0	50.0	50.0	49.2	48.0	...	...	...	...
32	54.3	...	54.3	...	54.3	54.3	54.3	54.3	53.5	52.2	...	...	...	...
33	25.7	...	25.7	25.7	25.7	25.5	25.3	25.0	24.6	...	...	...	...	...
34	30.0	...	30.0	30.0	30.0	29.7	29.5	29.1	28.7	...	...	...	...	...
35	30.0	...	30.0	30.0	30.0	29.7	29.5	29.1	28.7	...	...	...	...	...
36	32.9	...	32.9	32.9	32.9	32.5	32.3	31.9	31.5	...	...	...	...	...
37	34.3	...	34.3	34.3	34.3	33.9	33.7	33.3	32.9	...	...	...	...	...
38	18.6	18.6	18.6	...	18.6	18.6	18.6	17.5	16.7	...	...	...	...	...
39	15.8	...	15.8	...	15.8	15.8	15.8	14.9	14.2	...	...	...	...	...
40	18.6	18.6	18.6	...	18.6	18.6	18.6	17.5	16.7	...	...	...	...	...
41	15.8	15.8	15.8	...	15.8	15.8	15.8	14.9	14.2	...	...	...	...	...
42	18.6	18.6	18.6	...	18.6	18.6	18.6	17.5	16.7	...	...	...	...	...
43	18.6	18.6	18.6	...	18.6	18.6	18.6	18.5	17.6	16.6	13.9	11.4	9.0	6.5
44	20.0	...	20.0	...	20.0	20.0	20.0	18.8	17.9	...	...	...	...	...
45	20.0	...	20.0	...	20.0	20.0	20.0	18.8	17.9	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
23	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	3½Ni	Forgings	SA-765	III	K32026 ...	...	...	9B	1
2	3½Ni	Plate	SA-203	E	K32018 ...	...	...	9B	1
3	3½Ni	Plate	SA-203	E	K32018 ...	...	...	9B	1
4	3½Ni	Castings	SA-352	LC3	J31550 ...	...	...	9B	1
5	3½Ni	Plate	SA-203	F	...	...	>2	9B	1
6	3½Ni	Plate	SA-203	F	...	...	≤2	9B	1
7	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375 3	...	...	3	3
8	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375 1	...	...	11A	5
9	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375 2	...	...	11B	10
10	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045 1	...	...	...	...
11	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045 2	...	...	...	...
12	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045 3	...	...	...	...
13	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045 4	...	...	...	...
14	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045 5	...	...	...	...
15	5Ni-¼Mo	Plate	SA-645	A	K41583 ...	...	...	11A	2
16	7Ni	Plate	SA-553	III	K61365 ...	...	≤2	11A	1
17	7Ni	Plate	SA-553	III	K61365 ...	...	≤2	11A	1
18	8Ni	Forgings	SA-522	II	K71340 ...	...	...	11A	1
19	8Ni	Plate	SA-553	II	K71340 ...	...	...	11A	1
20	8Ni	Plate	SA-553	II	K71340 ...	...	...	11A	1
21	9Ni	Plate	SA/EN 10028-4 X8Ni9	...	...	NNT640	≤2	11A	1
22	9Ni	Plate	SA/EN 10028-4 X8Ni9	...	...	QT640	≤2	11A	1
23	9Ni	Plate	SA/EN 10028-4 X7Ni9	...	...	QT	≤2	11A	1
24	9Ni	Plate	SA/EN 10028-4 X7Ni9	...	...	QT	≤2	11A	1
25	9Ni	Plate	SA/EN 10028-4 X8Ni9	...	...	QT680	≤2	11A	1
26	9Ni	Plate	SA/EN 10028-4 X8Ni9	...	...	QT680	≤2	11A	1
27	9Ni	Smls. & wld. pipe	SA-333	8	K81340 ...	...	...	11A	1
28	9Ni	Smls. & wld. pipe	SA-333	8	K81340 ...	...	...	11A	1
29	9Ni	Smls. pipe	SA-333	8	K81340 ...	...	...	11A	1
30	9Ni	Smls. pipe	SA-333	8	K81340 ...	...	...	11A	1
31	9Ni	Wld. pipe	SA-333	8	K81340 ...	...	...	11A	1
32	9Ni	Wld. tube	SA-334	8	K81340 ...	...	...	11A	1
33	9Ni	Smls. & wld. tube	SA-334	8	K81340 ...	...	...	11A	1
34	9Ni	Smls. tube	SA-334	8	K81340 ...	...	...	11A	1
35	9Ni	Smls. tube	SA-334	8	K81340 ...	...	...	11A	1
36	9Ni	Wld. tube	SA-334	8	K81340 ...	...	...	11A	1
37	9Ni	Plate	SA-353	...	K81340 ...	...	...	11A	1
38	9Ni	Plate	SA-353	...	K81340 ...	...	...	11A	1
39	9Ni	Plate	SA-353	...	K81340 ...	...	...	11A	1
40	9Ni	Smls. & wld. fittings	SA-420	WPL8	K81340 ...	...	...	11A	1
41	9Ni	Smls. & wld. fittings	SA-420	WPL8	K81340 ...	...	...	11A	1
42	9Ni	Forgings	SA-522	I	K81340 ...	...	...	11A	1
43	9Ni	Forgings	SA-522	I	K81340 ...	...	...	11A	1
44	9Ni	Plate	SA-553	I	K81340 ...	...	...	11A	1
45	9Ni	Plate	SA-553	I	K81340 ...	...	...	11A	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	70	37.5	NP	NP	650	650	CS-2	...
2	70	40	NP	300 (SPT)	NP	NP	CS-2	...
3	70	40	NP	650	1000	650	CS-2	T2
4	70	40	NP	100	650	650	CS-2	G1
5	75	50	NP	NP	650	650	CS-3	...
6	80	55	NP	NP	650	650	CS-3	...
7	90	70	NP	NP	650	650	CS-5	...
8	105	85	NP	600 (SPT)	650	NP	CS-5	...
9	115	100	NP	NP	650	NP	HT-1	...
10	115	100	NP	700 (SPT)	NP	NP	HT-1	W1
11	135	120	NP	700 (SPT)	NP	NP	HT-1	W1
12	155	140	NP	700 (SPT)	NP	NP	HT-1	W1
13	175	160	NP	700 (SPT)	NP	NP	HT-1	W1
14	190	180	NP	700 (SPT)	NP	NP	HT-1	W1
15	95	65	NP	NP	250	250	CS-3	...
16	100	85	NP	NP	150	NP	CS-3	G20, W4
17	100	85	NP	NP	150	NP	CS-3	G20, W5
18	100	75	NP	200 (Cl. 3 only)	NP	NP	CS-3	G20, W5
19	100	85	NP	200 (Cl. 3 only)	250	250	CS-3	G20, W5
20	100	85	NP	200 (Cl. 3 only)	250	250	CS-3	G20, W4
21	93	69.5	NP	NP	250	250	CS-3	G20
22	93	69.5	NP	NP	250	250	CS-3	G20
23	98.5	83.5	NP	NP	250	250	CS-3	G20, W4
24	98.5	83.5	NP	NP	250	250	CS-3	G20, W5
25	98.5	83.5	NP	NP	250	250	CS-3	G20, W4
26	98.5	83.5	NP	NP	250	250	CS-3	G20, W5
27	100	75	NP	200 (Cl. 3 only)	NP	NP	CS-3	G20, W12
28	100	75	NP	200 (Cl. 3 only)	NP	NP	CS-3	G20, W5, W12
29	100	75	NP	NP	250	250	CS-3	G20, W4
30	100	75	NP	NP	250	250	CS-3	G20, W5
31	100	75	NP	NP	250	250	CS-3	G20, G24, W3
32	100	75	NP	200 (Cl. 3 only)	NP	NP	CS-3	G20, W12
33	100	75	NP	200 (Cl. 3 only)	NP	NP	CS-3	G20, W5, W12
34	100	75	NP	NP	250	250	CS-3	G20, W4
35	100	75	NP	NP	250	250	CS-3	G20, W5
36	100	75	NP	NP	250	250	CS-3	G20, G24, W3
37	100	75	NP	200 (Cl. 3 only)	250	250	CS-3	G20, W4
38	100	75	NP	NP	250	250	CS-3	G20, W5
39	100	75	NP	200 (Cl. 3 only)	NP	NP	CS-3	G20, W5
40	100	75	NP	NP	250	250	CS-3	G20, W4
41	100	75	NP	NP	250	250	CS-3	G20, W3
42	100	75	NP	200 (Cl. 3 only)	250	250	CS-3	G20, S8, W4
43	100	75	NP	NP	250	250	CS-3	G20, S8, W5
44	100	85	NP	200 (Cl. 3 only)	250	250	CS-3	G20, W4
45	100	85	NP	200 (Cl. 3 only)	250	250	CS-3	G20, W5

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	20.0	20.0	...	20.0	20.0	20.0	18.8	17.9	...	...	...	...	...
2	20.0	...	20.0	...	20.0	...	...	...	...	...	...	...	...	...
3	20.0	...	20.0	...	20.0	20.0	20.0	20.0	19.0	18.0	14.8	12.0	9.3	6.5
4	20.0	20.0	20.0	...	20.0	20.0	20.0	20.0	19.0	...	...	...	...	...
5	21.4	21.4	21.4	...	21.4	21.4	21.4	21.4	20.5	...	...	...	...	...
6	22.9	22.9	22.9	...	22.9	22.9	22.9	22.9	20.5	...	...	...	...	...
7	25.7	...	25.7	25.7	25.7	25.5	25.3	25.0	24.6	...	...	...	...	...
8	30.0	...	30.0	30.0	30.0	29.7	29.5	29.1	28.7	...	...	...	...	...
9	32.9	...	32.9	32.9	32.9	32.5	32.3	31.9	31.5	...	...	...	...	...
10	32.9	...	32.9	...	32.9	32.9	32.9	32.9	32.4	31.6	...	...	...	...
11	38.6	...	38.6	...	38.6	38.6	38.6	38.6	38.0	37.1	...	...	...	...
12	44.3	...	44.3	...	44.3	44.3	44.3	44.3	43.6	42.6	...	...	...	...
13	50.0	...	50.0	...	50.0	50.0	50.0	50.0	49.2	48.0	...	...	...	...
14	54.3	...	54.3	...	54.3	54.3	54.3	54.3	53.5	52.2	...	...	...	...
15	27.1	...	27.1	26.6	...	...	...	...	...	...	...	...	...	...
16	28.6	28.6	...	...	...	...	...	...	...	...	...	...	...	...
17	27.1	27.1	...	...	...	...	...	...	...	...	...	...	...	...
18	27.1	27.1	25.4	...	...	...	...	...	...	...	...	...	...	...
19	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...
20	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
21	26.5	26.5	26.5	26.5	...	...	...	...	...	...	...	...	...	...
22	26.5	26.5	26.5	26.5	...	...	...	...	...	...	...	...	...	...
23	28.2	28.2	28.2	28.2	...	...	...	...	...	...	...	...	...	...
24	27.1	27.1	27.1	27.1	...	...	...	...	...	...	...	...	...	...
25	28.2	28.2	28.2	28.2	...	...	...	...	...	...	...	...	...	...
26	27.1	27.1	27.1	27.1	...	...	...	...	...	...	...	...	...	...
27	28.6	28.6	26.7	...	...	...	...	...	...	...	...	...	...	...
28	27.1	27.1	25.4	...	...	...	...	...	...	...	...	...	...	...
29	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
30	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...
31	24.3	24.3	22.7	22.1	...	...	...	...	...	...	...	...	...	...
32	28.6	28.6	26.7	...	...	...	...	...	...	...	...	...	...	...
33	27.1	27.1	25.4	...	...	...	...	...	...	...	...	...	...	...
34	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
35	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...
36	24.3	24.3	22.7	22.1	...	...	...	...	...	...	...	...	...	...
37	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
38	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...
39	27.1	27.1	25.4	...	...	...	...	...	...	...	...	...	...	...
40	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
41	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...
42	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
43	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...
44	28.6	28.6	26.7	25.9	...	...	...	...	...	...	...	...	...	...
45	27.1	27.1	25.4	24.6	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	4.5	2.5	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	25Ni-15Cr-2Ti	Forgings, bar	SA-638	660	S66286	...	...	...	...
2	27Ni-22Cr-7Mo-Mn-Cu-N	Smls. tube	SA-213	...	S31277	...	...	45	...
3	27Ni-22Cr-7Mo-Mn-Cu-N	Smls. tube	SA-213	...	S31277	...	...	45	...
4	27Ni-22Cr-7Mo-Mn-Cu-N	Plate	SA-240	...	S31277	...	...	45	...
5	27Ni-22Cr-7Mo-Mn-Cu-N	Plate	SA-240	...	S31277	...	...	45	...
6	27Ni-22Cr-7Mo-Mn-Cu-N	Wld. tube	SA-249	...	S31277	...	...	45	...
7	27Ni-22Cr-7Mo-Mn-Cu-N	Wld. tube	SA-249	...	S31277	...	...	45	...
8	29Ni-20Cr-3Cu-2Mo	Castings	SA-351	CN7M	J95150	...	...	45	...
9	29Ni-20Cr-3Cu-2Mo	Castings	SA-351	CN7M	J95150	...	...	45	...
10	14Cr-16Ni-6Si-Cu-Mo	Smls. tube	SA-213	...	S38815	...	...	8	1
11	14Cr-16Ni-6Si-Cu-Mo	Smls. tube	SA-213	...	S38815	...	...	8	1
12	14Cr-16Ni-6Si-Cu-Mo	Plate	SA-240	...	S38815	...	...	8	1
13	14Cr-16Ni-6Si-Cu-Mo	Plate	SA-240	...	S38815	...	...	8	1
14	14Cr-16Ni-6Si-Cu-Mo	Wld. tube	SA-249	...	S38815	...	...	8	1
15	14Cr-16Ni-6Si-Cu-Mo	Wld. tube	SA-249	...	S38815	...	...	8	1
16	14Cr-16Ni-6Si-Cu-Mo	Wld. pipe	SA-312	...	S38815	...	...	8	1
17	14Cr-16Ni-6Si-Cu-Mo	Wld. pipe	SA-312	...	S38815	...	...	8	1
18	14Cr-16Ni-6Si-Cu-Mo	Smls. & wld. fittings	SA-403	...	S38815	...	...	8	1
19	14Cr-16Ni-6Si-Cu-Mo	Smls. & wld. fittings	SA-403	...	S38815	...	...	8	1
20	14Cr-16Ni-6Si-Cu-Mo	Bar	SA-479	...	S38815	...	...	8	1
21	14Cr-16Ni-6Si-Cu-Mo	Bar	SA-479	...	S38815	...	...	8	1
22	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	8	3
23	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	8	3
24	16Cr-9Mn-2Ni-N	Plate	SA-240	204	S20400	...	...	8	3
25	16Cr-9Mn-2Ni-N	Plate	SA-240	204	S20400	...	...	8	3
(23)	26	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	8	1
(23)	27	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	8	1
(23)	28	16Cr-12Ni-2Mo	Forgings	SA-965	F316L	S31603	...	8	1
(23)	29	16Cr-12Ni-2Mo	Forgings	SA-965	F316L	S31603	...	8	1
(23)	30	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	8	1
(23)	31	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	8	1
(23)	32	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...	8	1
(23)	33	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...	8	1
(23)	34	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...	8	1
(23)	35	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...	8	1
36	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	...	8	1
(23)	37	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	8	1
(23)	38	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	8	1
(23)	39	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316L	S31603	...	8	1
(23)	40	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316L	S31603	...	8	1
(23)	41	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	...	8	1
(23)	42	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	...	8	1
43	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	1	...	8	1
(23)	44	16Cr-12Ni-2Mo	Smls. & wld. fittings	SA-403	316L	S31603	...	8	1
45	16Cr-12Ni-2Mo	Wld. pipe	SA-409	TP316L	S31603	...	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	130	85	NP	700	700	NP	HA-5	W1
2	112	52	NP	NP	800	NP	NFN-26	G5
3	112	52	NP	NP	800	NP	NFN-26	...
4	112	52	NP	NP	800	NP	NFN-26	G5
5	112	52	NP	NP	800	NP	NFN-26	...
6	112	52	NP	NP	800	NP	NFN-26	G3, G5
7	112	52	NP	NP	800	NP	NFN-26	...
8	62	25	600	600 (Cl. 3 only)	600	NP	NFN-9	G1, G5
9	62	25	600	NP	600	NP	NFN-9	G1
10	78	37	NP	NP	800	NP	HA-2	G5
11	78	37	NP	NP	800	NP	HA-2	...
12	78	37	NP	NP	800	NP	HA-2	G5
13	78	37	NP	NP	800	NP	HA-2	...
14	78	37	NP	NP	800	NP	HA-2	G5
15	78	37	NP	NP	800	NP	HA-2	...
16	78	37	NP	NP	800	NP	HA-2	G5
17	78	37	NP	NP	800	NP	HA-2	...
18	78	37	NP	NP	800	NP	HA-2	G5, W14
19	78	37	NP	NP	800	NP	HA-2	W14
20	78	37	NP	NP	800	NP	HA-2	G5
21	78	37	NP	NP	800	NP	HA-2	...
22	95	45	NP	NP	800	650	HA-6	G5
23	95	45	NP	NP	800	650	HA-6	...
24	95	48	NP	NP	900	650	HA-6	G5
25	95	48	NP	NP	900	650	HA-6	...
26	65	25	850	800	1200	650	HA-4	G5, T12
27	65	25	850	NP	1200	650	HA-4	G21, T12
28	65	25	850	800	1200	650	HA-4	G5, T12
29	65	25	850	NP	1200	650	HA-4	G21, T12
30	70	25	850	800	1200	650	HA-4	G5, T12
31	70	25	850	NP	1200	650	HA-4	G21, T12
32	70	25	850	800	1200	NP	HA-4	G5, T12
33	70	25	850	NP	1200	NP	HA-4	G21, T12
34	70	25	850	800	1200	650	HA-4	G5, T12
35	70	25	850	NP	1200	650	HA-4	G21, T12
36	70	25	NP	800	NP	NP	HA-4	G5, W12
37	70	25	850	NP	1200	650	HA-4	G5, G21, G24, T12
38	70	25	850	NP	1200	650	HA-4	G21, G24, T12
39	70	25	850	800	1200	650	HA-4	G5, G21, T12, W12, W14
40	70	25	850	NP	1200	650	HA-4	G21, T12
41	70	25	850	NP	1200	650	HA-4	G5, G21, G24, T12
42	70	25	850	NP	1200	650	HA-4	G21, G24, T12
43	70	25	NP	800	NP	NP	HA-4	G5
44	70	25	NP	800	1200	650	HA-4	G5, T12, W12, W14
45	70	25	NP	800	NP	NP	HA-4	G5

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	37.1	...	37.1	...	37.1	37.1	36.5	35.8	35.4	35.0	...	...	...	...
2	32.0	32.0	32.0	31.5	30.7	29.4	28.4	27.5	27.1	26.8	26.5	26.3	...	...
3	32.0	32.0	32.0	30.4	28.8	26.5	25.5	25.4	25.4	25.3	25.1	24.9	...	...
4	32.0	32.0	32.0	31.5	30.7	29.4	28.4	27.5	27.1	26.8	26.5	26.3	...	...
5	32.0	32.0	32.0	30.4	28.8	26.5	25.5	25.4	25.4	25.3	25.1	24.9	...	...
6	27.2	27.2	27.2	26.8	26.1	24.9	24.1	23.4	23.1	22.7	22.5	22.3	...	...
7	27.2	27.2	27.2	25.8	24.5	22.5	21.7	21.6	21.6	21.5	21.3	21.2	...	...
8	16.7	...	16.0	...	13.6	12.8	12.1	11.6	...	...	...	...	...	...
9	16.7	...	14.4	...	12.9	11.8	10.8	10.0	...	...	...	...	...	...
10	22.3	...	22.3	...	22.2	21.5	21.0	20.7	20.6	20.6	20.6	20.5	...	...
11	22.3	...	20.8	...	18.5	17.1	16.3	16.0	16.0	16.0	16.0	16.0	...	...
12	22.3	...	22.3	...	22.2	21.5	21.0	20.7	20.6	20.6	20.6	20.5	...	...
13	22.3	...	20.8	...	18.5	17.1	16.3	16.0	16.0	16.0	16.0	16.0	...	...
14	18.9	...	18.9	...	18.9	18.3	17.8	17.6	17.5	17.5	17.5	17.5	...	...
15	18.9	...	17.7	...	15.7	14.5	13.8	13.6	13.6	13.6	13.6	13.6	...	...
16	18.9	...	18.9	...	18.9	18.3	17.8	17.6	17.5	17.5	17.5	17.5	...	...
17	18.9	...	17.7	...	15.7	14.5	13.8	13.6	13.6	13.6	13.6	13.6	...	...
18	22.3	...	22.3	...	22.2	21.5	21.0	20.7	20.6	20.6	20.6	20.5	...	...
19	22.3	...	20.8	...	18.5	17.1	16.3	16.0	16.0	16.0	16.0	16.0	...	...
20	22.3	...	22.3	...	22.2	21.5	21.0	20.7	20.6	20.6	20.6	20.5	...	...
21	22.3	...	20.8	...	18.5	17.1	16.3	16.0	16.0	16.0	16.0	16.0	...	...
22	27.1	...	23.7	...	21.2	20.1	20.0	19.6	19.6	19.4	19.2	18.8	...	...
23	27.1	...	23.7	...	21.2	20.1	19.7	19.2	18.6	18.0	17.4	16.7	...	...
24	27.1	...	23.6	...	20.6	18.9	18.1	17.9	17.9	17.9	17.8	17.7	17.4	16.9
25	27.1	...	23.6	...	20.3	17.9	16.5	15.8	15.6	15.5	15.3	15.1	14.8	14.3
26	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
27	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
28	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
29	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
30	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
31	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
32	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
33	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
34	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
35	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
36	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
37	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	10.8	10.5
38	14.2	...	12.1	...	10.8	9.9	9.3	8.8	8.7	8.5	8.3	8.1	8.0	7.8
39	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
40	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
41	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	10.8	10.5
42	14.2	...	12.1	...	10.8	9.9	9.3	8.8	8.7	8.5	8.3	8.1	8.0	7.8
43	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
44	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
45	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
27	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	(23)
28	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
29	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	(23)
30	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
31	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	(23)
32	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
33	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	(23)
34	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
35	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	(23)
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	10.3	10.1	9.9	9.7	7.5	5.4	...	...	...	...	...	...	...	...	(23)
38	7.7	7.5	7.3	7.1	7.1	5.4	...	...	...	...	...	...	...	...	(23)
39	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
40	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	(23)
41	10.3	10.1	9.9	9.7	7.5	5.4	...	...	...	...	...	...	...	...	(23)
42	7.7	7.5	7.3	7.1	7.1	5.4	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	(23)
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
(23) 1	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	...	...	8	1
(23) 2	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	...	...	8	1
3	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316L	S31603	...	...	8	1
4	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316L	S31603	...	...	8	1
5	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316L	S31603	...	...	8	1
6	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316L	S31603	...	...	8	1
7	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316L	S31603	...	...	8	1
8	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316L	...	...	...	8	1
9	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	>5	8	1
10	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	>5	8	1
11	16Cr-12Ni-2Mo	Forgings	SA-965	F316	S31600	...	...	8	1
12	16Cr-12Ni-2Mo	Forgings	SA-965	F316	S31600	...	...	8	1
13	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	>5	8	1
14	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	>5	8	1
15	16Cr-12Ni-2Mo	Forgings	SA-965	F316H	S31609	...	...	8	1
16	16Cr-12Ni-2Mo	Forgings	SA-965	F316H	S31609	...	...	8	1
17	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	≤5	8	1
18	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	≤5	8	1
19	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
20	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
21	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...	...	8	1
22	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...	...	8	1
23	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
24	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
25	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
26	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
27	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	8	1
28	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	8	1
29	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
30	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
31	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	1	...	8	1
32	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
33	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
34	16Cr-12Ni-2Mo	Smls. & wld. fittings	SA-403	316	S31600	...	...	8	1
35	16Cr-12Ni-2Mo	Wld. pipe	SA-409	TP316	S31600	...	...	8	1
36	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	...	...	8	1
37	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	...	...	8	1
38	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
39	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
40	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
41	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316	S31600	...	...	8	1
42	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316	S31600	...	...	8	1
43	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316	...	...	...	8	1
44	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	≤5	8	1
45	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	≤5	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	70	25	850	800	1200	650	HA-4	G5, G21, G22, T12
2	70	25	850	NP	1200	650	HA-4	G21, G22, T12
3	70	25	NP	800	NP	NP	HA-4	G5, W12
4	70	25	NP	NP	850	650	HA-4	G5, G24
5	70	25	NP	NP	850	650	HA-4	G24
6	70	25	NP	800	NP	NP	HA-4	G5, W12
7	70	25	NP	800	NP	NP	HA-4	G5, W12
8	70	25	850	800	850	NP	HA-4	G5, G21, G22
9	70	30	1500	800	1500	650	HA-2	G5, G12, T8
10	70	30	1500	NP	1500	650	HA-2	G12, T9
11	70	30	1500	800	1500	650	HA-2	G5, G12, T8
12	70	30	1500	NP	1500	650	HA-2	G12, T9
13	70	30	1500	800	1500	NP	HA-2	G5, G12, T8
14	70	30	1500	NP	1500	NP	HA-2	T9
15	70	30	NP	800	1500	NP	HA-2	G5, T8
16	70	30	NP	NP	1500	NP	HA-2	T9
17	75	30	1500	800	1500	NP	HA-2	G5, G12, T8
18	75	30	1500	NP	1500	NP	HA-2	G12, T9
19	75	30	1500	800	1500	NP	HA-2	G5, G12, T8
20	75	30	1500	NP	1500	NP	HA-2	G12, T9
21	75	30	1500	800	1500	650	HA-2	G5, G12, T8
22	75	30	1500	NP	1500	650	HA-2	G12, T9
23	75	30	1500	NP	NP	NP	HA-2	G12, T9, W13
24	75	30	1500	800	NP	NP	HA-2	G5, G12, T8, W12, W13
25	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T7
26	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T9
27	75	30	1500	800	1500	650	HA-2	G5, G12, T8, W12, W13, W14
28	75	30	1500	NP	1500	650	HA-2	G12, T9, W13, W14
29	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T7
30	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T9
31	75	30	NP	800	NP	NP	HA-2	G5, W12
32	75	30	1500	800	1500	650	HA-2	G5, G12, H1, T8, W12
33	75	30	1500	NP	1500	650	HA-2	G12, H1, T9
34	75	30	NP	800	1500	650	HA-2	G5, G12, T8, W12, W14
35	75	30	NP	800	NP	NP	HA-2	G5, W12
36	75	30	1500	800	1500	650	HA-2	G5, G12, G22, H1, T8
37	75	30	1500	NP	1500	650	HA-2	G12, G22, H1, T9
38	75	30	NP	800	NP	NP	HA-2	G5, W12
39	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T7
40	75	30	NP	NP	1500	650	HA-2	G12, G24, T9
41	75	30	NP	800	NP	NP	HA-2	G5, W12
42	75	30	NP	800	NP	NP	HA-2	G5, W12
43	75	30	1500	800	1500	NP	HA-2	G5, G12, G22, H1, T8
44	75	30	1500	800	1500	NP	HA-2	G5, T8
45	75	30	1500	NP	1500	NP	HA-2	T9

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	12.4
2	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	9.2
3	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
4	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	10.8	...
5	14.2	...	12.1	...	10.8	9.9	9.3	8.8	8.7	8.5	8.3	8.1	8.0	...
6	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
7	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
8	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	...
9	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
10	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
11	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
12	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
13	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
14	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
15	20.0	...	20.0	...	19.4	19.2	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
16	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
17	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
18	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
19	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
20	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
21	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
22	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
23	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
24	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
25	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
26	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
27	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
28	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
29	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
30	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
31	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
32	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
33	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
34	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
35	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
36	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
37	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
38	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
39	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
40	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
41	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
42	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
43	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
44	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
45	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	12.1	11.9	11.6	11.4	8.8	6.4	...	...	...	...	...	...	...	...	...
2	9.0	8.8	8.6	8.4	8.3	6.4	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
10	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
11	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
12	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
13	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
14	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
15	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
16	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
17	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
18	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
19	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
20	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
21	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
22	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
23	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
24	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
25	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
26	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
27	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
28	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
29	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
30	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
33	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
34	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
37	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
40	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
44	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
45	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design/UNS No.	Condition/ Temper		
1	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316H	S31609	...	...	8 1
2	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316H	S31609	...	...	8 1
3	16Cr-12Ni-2Mo	Plate	SA-240	316H	S31609	...	...	8 1
4	16Cr-12Ni-2Mo	Plate	SA-240	316H	S31609	...	...	8 1
5	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8 1
6	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8 1
7	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8 1
8	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8 1
9	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316H	S31609	...	...	8 1
10	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316H	S31609	...	...	8 1
11	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316H	S31609	...	...	8 1
12	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316H	S31609	...	...	8 1
13	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	1	...	8 1
14	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316H	S31609	...	...	8 1
15	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316H	S31609	...	...	8 1
16	16Cr-12Ni-2Mo	Smls. & wld. fittings	SA-403	316H	S31609	...	...	8 1
17	16Cr-12Ni-2Mo	Bar	SA-479	316H	S31609	...	...	8 1
18	16Cr-12Ni-2Mo	Bar	SA-479	316H	S31609	...	...	8 1
19	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316H	S31609	...	...	8 1
20	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316H	S31609	...	...	8 1
21	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X2CrNiMo17-12-2	...	...	≤3	8 1
22	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X2CrNiMo17-12-2	...	...	≤3	8 1
23	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X5CrNiMo17-12-2	...	...	≤3	8 1
24	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X5CrNiMo17-12-2	...	...	≤3	8 1
25	16Cr-12Ni-2Mo-Cb	Plate	SA-240	316Cb	S31640	...	...	8 1
26	16Cr-12Ni-2Mo-Cb	Plate	SA-240	316Cb	S31640	...	...	8 1
27	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...	>5	8 1
28	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316LN	S31653	...	...	8 1
29	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...	≤5	8 1
30	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316LN	S31653	...	...	8 1
31	16Cr-12Ni-2Mo-N	Plate	SA-240	316LN	S31653	...	...	8 1
32	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316LN	S31653	...	...	8 1
33	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316LN	S31653	...	...	8 1
34	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	1	...	8 1
35	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316LN	S31653	...	...	8 1
36	16Cr-12Ni-2Mo-N	Fittings	SA-403	316LN	S31653	...	...	8 1
37	16Cr-12Ni-2Mo-N	Bar	SA-479	316LN	S31653	...	...	8 1
38	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316LN	S31653	...	...	8 1
39	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316N	S31651	...	...	8 1
40	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316N	S31651	...	...	8 1
41	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316N	S31651	...	...	8 1
42	16Cr-12Ni-2Mo-N	Plate	SA-240	316N	S31651	...	...	8 1
43	16Cr-12Ni-2Mo-N	Plate	SA-240	316N	S31651	...	...	8 1
44	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651	...	...	8 1
45	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651	...	...	8 1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	1500	800	1500	NP	HA-2	G5, T8
2	75	30	1500	NP	1500	NP	HA-2	T9
3	75	30	1500	800	1500	NP	HA-2	G5, T8
4	75	30	1500	NP	1500	NP	HA-2	T9
5	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, T7
6	75	30	1500	NP	1500	NP	HA-2	G3, G24, T9
7	75	30	1500	NP	NP	NP	HA-2	T9, W13
8	75	30	1500	800	NP	NP	HA-2	G5, T8, W12, W13
9	75	30	1500	800	1500	NP	HA-2	G5, T8, W12, W13
10	75	30	1500	NP	1500	NP	HA-2	T9, W13
11	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, T7
12	75	30	1500	NP	1500	NP	HA-2	G3, G24, T9
13	75	30	NP	800	NP	NP	HA-2	G5, W12
14	75	30	1500	800	1500	NP	HA-2	G5, H1, T8
15	75	30	1500	NP	1500	NP	HA-2	H1, T9
16	75	30	NP	800	1500	NP	HA-2	G5, G12, T8, W12, W14
17	75	30	1500	800	NP	NP	HA-2	G5, H1, T8
18	75	30	1500	NP	NP	NP	HA-2	H1, T9
19	75	30	NP	800	NP	NP	HA-2	G5, W12
20	75	30	NP	800	NP	NP	HA-2	G5, W12
21	75	32	NP	NP	850	650	HA-4	G5, G30
22	75	32	NP	NP	850	650	HA-4	G30
23	75	32	NP	NP	1022	650	HA-2	G5, G12, G30
24	75	32	NP	NP	1022	650	HA-2	G12, G30
25	75	30	NP	NP	1500	650	HA-2	G5, G12, T8
26	75	30	NP	NP	1500	650	HA-2	G12, T9
27	70	30	NP	800	NP	NP	HA-2	G5
28	70	30	NP	800	NP	NP	HA-2	G5
29	75	30	NP	800	NP	NP	HA-2	G5
30	75	30	NP	800	NP	NP	HA-2	G5
31	75	30	NP	800	NP	NP	HA-2	G5
32	75	30	NP	800	NP	NP	HA-2	G5, W12
33	75	30	NP	800	NP	NP	HA-2	G5, W12
34	75	30	NP	800	NP	NP	HA-2	G5, W12
35	75	30	NP	800	NP	NP	HA-2	G5
36	75	30	NP	800	NP	NP	HA-2	G5, W12
37	75	30	NP	800	NP	NP	HA-2	G5
38	75	30	NP	800	NP	NP	HA-2	G5, W12
39	80	35	NP	800	NP	NP	HA-2	G5
40	80	35	1200	800	1200	NP	HA-2	G5, G12, T7
41	80	35	1200	NP	1200	NP	HA-2	G12, T8
42	80	35	NP	800	1200	650	HA-2	G5, G12, T7
43	80	35	NP	NP	1200	650	HA-2	G12, T8
44	80	35	1200	NP	NP	NP	HA-2	G5, G12, T7, W13
45	80	35	1200	NP	NP	NP	HA-2	G12, T8, W13

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
2	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
3	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
4	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
5	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
6	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
7	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
8	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
9	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
10	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
11	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
12	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
13	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
14	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
15	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
16	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
17	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
18	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
19	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
20	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
21	21.3	...	21.3	...	21.3	20.1	18.8	17.9	17.6	17.2	16.9	16.6	16.2	...
22	21.3	...	18.1	...	16.2	14.9	13.9	13.3	13.0	12.8	12.5	12.3	12.0	...
23	21.3	...	21.3	...	21.3	20.5	19.1	18.1	17.7	17.4	17.2	16.9	16.7	16.6
24	21.3	...	18.4	...	16.6	15.2	14.2	13.4	13.1	12.9	12.7	12.5	12.4	12.3
25	20.0	...	20.0	...	20.0	19.4	17.8	16.8	16.5	16.2	16.0	15.9	15.8	15.7
26	20.0	...	17.7	...	15.8	14.3	13.2	12.4	12.2	12.0	11.9	11.8	11.7	11.6
27	20.0	...	20.0	...	18.9	17.9	17.2	16.5	16.0	15.6	15.2	14.8	...	...
28	20.0	...	20.0	...	18.9	17.9	17.2	16.5	16.0	15.6	15.2	14.8	...	...
29	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
30	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
31	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
32	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
33	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
34	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
35	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
36	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
37	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
38	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
39	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	...	...
40	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
41	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7
42	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
43	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7
44	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
45	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
2	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
3	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
4	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
5	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
6	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
7	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
8	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
9	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
10	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
11	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
12	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
15	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
16	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
17	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
18	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	16.4	16.3	16.1	...	...	...	...	...	...	...	...	...	...	...	...
24	12.1	12.0	11.9	...	...	...	...	...	...	...	...	...	...	...	...
25	15.5	15.3	15.1	12.3	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
26	11.5	11.4	11.2	11.0	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
41	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
42	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
43	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
44	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
45	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Size/Thickness, in.	Group
					Design/UNS No.	Class/Condition/Temper	
1	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651 ...	...	8 1
2	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651 ...	...	8 1
3	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316N	S31651 ...	...	8 1
4	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316N	S31651 ...	...	8 1
5	16Cr-12Ni-2Mo-N	Wld. pipe	SA-312	TP316N	S31651 ...	...	8 1
6	16Cr-12Ni-2Mo-N	Wld. pipe	SA-312	TP316N	S31651 ...	...	8 1
7	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651 1	...	8 1
8	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316N	S31651 ...	...	8 1
9	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316N	S31651 ...	...	8 1
10	16Cr-12Ni-2Mo-N	Smls. & wld. fittings	SA-403	316N	S31651 ...	...	8 1
11	16Cr-12Ni-2Mo-N	Bar	SA-479	316N	S31651 ...	...	8 1
12	16Cr-12Ni-2Mo-N	Bar	SA-479	316N	S31651 ...	...	8 1
13	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316N	S31651 ...	...	8 1
14	16Cr-12Ni-2Mo-N	Wld. pipe	SA-813	TP316N	S31651 ...	...	8 1
15	16Cr-12Ni-2Mo-N	Wld. pipe	SA-814	TP316N	S31651 ...	...	8 1
16	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316N	S31651 ...	...	8 1
17	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316N	S31651 ...	...	8 1
18	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-11-2	...	≤3	8 1
19	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-13-3	...	≤3	8 1
20	16Cr-12Ni-2Mo-Ti	Plate	SA-240	316Ti	S31635 ...	...	8 1
21	16Cr-12Ni-2Mo-Ti	Plate	SA-240	316Ti	S31635 ...	...	8 1
22	17Cr-4Ni-6Mn	Plate	SA-240	201-1	S20100 ...	...	8 3
23	17Cr-4Ni-6Mn	Plate	SA-240	201-1	S20100 ...	...	8 3
24	17Cr-4Ni-6Mn	Plate	SA-666	201-1	S20100 ...	...	8 3
25	17Cr-4Ni-6Mn	Plate	SA-666	201-1	S20100 ...	...	8 3
26	17Cr-4Ni-6Mn	Plate	SA-240	201-2	S20100 ...	...	8 3
27	17Cr-4Ni-6Mn	Plate	SA-666	201-2	S20100 ...	...	8 3
28	17Cr-7Ni	Plate, sheet, strip	SA-240	301	S30100 ...	...	8 1
29	17Cr-7Ni	Plate, sheet, strip	SA-240	301	S30100 ...	...	8 1
30	17.5Cr-17.5Ni-5.3Si	Plate	SA-240	...	S30601 Sol. ann.	...	8 1
31	17.5Cr-17.5Ni-5.3Si	Plate	SA-240	...	S30601 Sol. ann.	...	8 1
32	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000 ...	...	8 3
33	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000 ...	...	8 3
34	18Cr-3Ni-12Mn	Wld. tube	SA-249	XM-29	S24000 ...	...	8 3
35	18Cr-3Ni-12Mn	Wld. tube	SA-249	XM-29	S24000 ...	...	8 3
36	18Cr-3Ni-12Mn	Wld. pipe	SA-312	XM-29	S24000 ...	...	8 3
37	18Cr-3Ni-12Mn	Wld. pipe	SA-312	XM-29	S24000 ...	...	8 3
38	18Cr-3Ni-12Mn	Bar	SA-479	XM-29	S24000 ...	...	8 3
39	18Cr-3Ni-12Mn	Bar	SA-479	XM-29	S24000 ...	...	8 3
40	18Cr-3Ni-12Mn	Wld. tube	SA-688	TPXM-29	S24000 ...	...	8 3
41	18Cr-3Ni-12Mn	Wld. tube	SA-688	TPXM-29	S24000 ...	...	8 3
42	18Cr-5Ni-3Mo	Smls. tube	SA-789	...	S31500 ...	...	10H 1
43	18Cr-5Ni-3Mo	Wld. tube	SA-789	...	S31500 ...	...	10H 1
44	18Cr-5Ni-3Mo	Smls. pipe	SA-790	...	S31500 ...	...	10H 1
45	18Cr-5Ni-3Mo	Wld. pipe	SA-790	...	S31500 ...	...	10H 1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	80	35	1200	NP	1200	650	HA-2	G3, G12, G24, T8
2	80	35	1200	NP	1200	650	HA-2	G3, G5, G12, G24, T7
3	80	35	1200	800	1200	650	HA-2	G5, G12, T7, W12, W13, W14
4	80	35	1200	NP	1200	650	HA-2	G12, T8, W13, W14
5	80	35	1200	NP	1200	650	HA-2	G3, G12, G24, T8
6	80	35	1200	NP	1200	650	HA-2	G3, G5, G12, G24, T7
7	80	35	NP	800	NP	NP	HA-2	G5, W12
8	80	35	1200	800	1200	650	HA-2	G5, G12, H1, T7
9	80	35	1200	NP	1200	650	HA-2	G12, H1, T8
10	80	35	NP	800	1200	650	HA-2	G5, G12, T7, W12, W14
11	80	35	1200	800	NP	NP	HA-2	G5, G12, H1, T7
12	80	35	1200	NP	NP	NP	HA-2	G12, H1, T8
13	80	35	NP	800	NP	NP	HA-2	G5, W12
14	80	35	NP	800	NP	NP	HA-2	G5, W12
15	80	35	NP	800	NP	NP	HA-2	G5, W12
16	80	35	NP	800	1200	650	HA-2	G5, G12, T7
17	80	35	NP	NP	1200	650	HA-2	G12, T8
18	84	41	NP	NP	800	650	HA-2	G5, G30
19	84	41	NP	NP	800	650	HA-2	G5, G30
20	75	30	NP	NP	1500	650	HA-2	G5, G12, T8
21	75	30	NP	NP	1500	650	HA-2	G12, T9
22	75	38	NP	NP	300	300	HA-2	...
23	75	38	NP	NP	300	300	HA-2	G5
24	75	38	NP	NP	300	300	HA-2	...
25	75	38	NP	NP	300	300	HA-2	G5
26	95	45	NP	NP	300	300	HA-6	...
27	95	45	NP	NP	300	300	HA-6	...
28	75	30	NP	NP	800	NP	HA-1	G5
29	75	30	NP	NP	800	NP	HA-1	...
30	78	37	NP	NP	500	NP	HA-1	G5, H6
31	78	37	NP	NP	500	NP	HA-1	H6
32	100	55	NP	NP	800	650	HA-6	G5
33	100	55	NP	NP	800	650	HA-6	...
34	100	55	NP	NP	800	650	HA-6	G5, G24
35	100	55	NP	NP	800	650	HA-6	G24
36	100	55	NP	NP	800	650	HA-6	G5, G24
37	100	55	NP	NP	800	650	HA-6	G24
38	100	55	NP	NP	800	650	HA-6	G5, G22
39	100	55	NP	NP	800	650	HA-6	G22
40	100	55	NP	NP	800	650	HA-6	G5, G24
41	100	55	NP	NP	800	650	HA-6	G24
42	92	64	NP	NP	750	650	HA-5	G19
43	92	64	NP	NP	750	650	HA-5	G19, G24
44	92	64	NP	NP	750	650	HA-5	G19
45	92	64	NP	NP	750	650	HA-5	G19, G24

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	19.4	...	17.6	...	16.1	15.0	14.0	13.3	12.9	12.6	12.3	12.1	11.9	11.6
2	19.4	...	19.4	...	18.7	18.2	18.1	17.9	17.4	17.0	16.7	16.3	16.0	15.7
3	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
4	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7
5	19.4	...	17.6	...	16.1	15.0	14.0	13.3	12.9	12.6	12.3	12.1	11.9	11.6
6	19.4	...	19.4	...	18.7	18.2	18.1	17.9	17.4	17.0	16.7	16.3	16.0	15.7
7	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	...	...
8	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
9	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7
10	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
11	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
12	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7
13	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	...	...
14	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	...	...
15	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	...	...
16	22.9	...	22.9	...	22.0	21.5	21.2	21.0	20.5	20.0	19.6	19.2	18.8	18.5
17	22.9	...	20.7	...	19.0	17.6	16.5	15.6	15.2	14.9	14.5	14.2	13.9	13.7
18	24.0	...	24.0	...	24.0	23.7	22.8	22.3	21.7	21.1	20.6	20.1	...	...
19	24.0	...	24.0	...	24.0	23.7	22.8	22.3	21.7	21.1	20.6	20.1	...	...
20	20.0	...	20.0	...	20.0	19.4	17.8	16.8	16.5	16.2	16.0	15.9	15.8	15.7
21	20.0	...	17.7	...	15.8	14.3	13.2	12.4	12.2	12.0	11.9	11.8	11.7	11.6
22	21.4	...	18.7	...	16.6	...	...	...	...	...	...	...	...	...
23	21.4	...	18.7	...	17.2	...	...	...	...	...	...	...	...	...
24	21.4	...	18.7	...	16.6	...	...	...	...	...	...	...	...	...
25	21.4	...	18.7	...	17.2	...	...	...	...	...	...	...	...	...
26	27.1	...	22.8	...	19.7	...	...	...	...	...	...	...	...	...
27	27.1	...	22.8	...	19.7	...	...	...	...	...	...	...	...	...
28	20.0	...	17.5	...	15.7	15.4	15.4	15.4	15.4	15.3	15.0	14.6	...	...
29	20.0	...	16.1	...	14.4	13.5	13.0	12.5	12.2	11.9	11.5	11.1	...	...
30	22.3	...	22.3	...	21.1	20.0	18.9	...	...	...	...	...	...	...
31	22.3	...	20.3	...	18.1	16.5	15.1	...	...	...	...	...	...	...
32	28.6	...	27.9	...	26.0	24.9	24.3	23.8	23.4	23.0	22.4	21.8	...	...
33	28.6	...	27.9	...	25.0	21.9	20.1	19.2	18.8	18.5	18.2	17.8	...	...
34	24.3	...	23.7	...	22.1	21.2	20.7	20.2	19.9	19.5	19.1	18.5	...	...
35	24.3	...	23.7	...	21.3	18.7	17.1	16.3	16.0	15.7	15.4	15.1	...	...
36	24.3	...	23.7	...	22.1	21.2	20.7	20.2	19.9	19.5	19.1	18.5	...	...
37	24.3	...	23.7	...	21.3	18.7	17.1	16.3	16.0	15.7	15.4	15.1	...	...
38	28.6	...	27.9	...	26.0	24.9	24.3	23.8	23.4	23.0	22.4	21.8	...	...
39	28.6	...	27.9	...	25.0	21.9	20.1	19.2	18.8	18.5	18.2	17.8	...	...
40	24.3	...	23.7	...	22.1	21.2	20.7	20.2	19.9	19.5	19.1	18.5	...	...
41	24.3	...	23.7	...	21.3	18.7	17.1	16.3	16.0	15.7	15.4	15.1	...	...
42	26.3	...	25.4	...	24.4	24.2	24.2	24.2	24.2	24.2	24.2	...	...	...
43	22.3	...	21.6	...	20.7	20.6	20.6	20.6	20.6	20.6	20.6	...	...	...
44	26.3	...	25.4	...	24.4	24.2	24.2	24.2	24.2	24.2	24.2	...	...	...
45	22.3	...	21.6	...	20.7	20.6	20.6	20.6	20.6	20.6	20.6	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	11.4	11.2	11.0	10.5	8.3	6.3	...	...	...	...	...	...	...	...	...
2	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...	...	...	...
3	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
4	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
5	11.4	11.2	11.0	10.5	8.3	6.3	...	...	...	...	...	...	...	...	...
6	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
9	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
10	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
11	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
12	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
17	13.4	13.2	12.9	12.3	9.8	7.4	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	15.5	15.3	15.1	12.3	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
21	11.5	11.4	11.2	11.0	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	>5	8	1
2	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	>5	8	1
3	18Cr-8Ni	Forgings	SA-965	F304L	S30403	...	...	8	1
4	18Cr-8Ni	Forgings	SA-965	F304L	S30403	...	...	8	1
5	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	≤5	8	1
6	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	≤5	8	1
7	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...	...	8	1
8	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...	...	8	1
9	18Cr-8Ni	Plate	SA-240	304L	S30403	...	...	8	1
10	18Cr-8Ni	Plate	SA-240	304L	S30403	...	...	8	1
11	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
12	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
13	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
14	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304L	S30403	...	...	8	1
15	18Cr-8Ni	Smls. pipe	SA-312	TP304L	S30403	...	...	8	1
16	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	...	...	8	1
17	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	...	...	8	1
18	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	1	...	8	1
19	18Cr-8Ni	Smls. & wld. fittings	SA-403	304L	S30403	...	...	8	1
20	18Cr-8Ni	Wld. pipe	SA-409	TP304L	S30403	...	...	8	1
21	18Cr-8Ni	Bar	SA-479	304L	S30403	...	...	8	1
22	18Cr-8Ni	Bar	SA-479	304L	S30403	...	...	8	1
23	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	8	1
24	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	8	1
25	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	8	1
26	18Cr-8Ni	Wld. pipe	SA-813	TP304L	S30403	...	...	8	1
27	18Cr-8Ni	Wld. pipe	SA-814	TP304L	S30403	...	...	8	1
28	18Cr-8Ni	Bar	SA/JIS G4303	SUS304L	...	...	...	8	1
29	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	>5	8	1
30	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	>5	8	1
31	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	>5	8	1
32	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	>5	8	1
33	18Cr-8Ni	Castings	SA-351	CF3	J92500	...	...	8	1
34	18Cr-8Ni	Castings	SA-351	CF3	J92500	...	...	8	1
35	18Cr-8Ni	Castings	SA-351	CF8	J92600	...	...	8	1
36	18Cr-8Ni	Castings	SA-351	CF8	J92600	...	...	8	1
37	18Cr-8Ni	Castings	SA-351	CF8	J92600	...	...	8	1
(23) 38	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	≥8	8	1
(23) 39	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	≥8	8	1
40	18Cr-8Ni	Cast pipe	SA-451	CPF3	J92500	...	...	8	1
41	18Cr-8Ni	Cast pipe	SA-451	CPF8	J92600	...	...	8	1
42	18Cr-8Ni	Forgings	SA-965	F304	S30400	...	...	8	1
43	18Cr-8Ni	Forgings	SA-965	F304	S30400	...	...	8	1
44	18Cr-8Ni	Forgings	SA-965	F304H	S30409	...	...	8	1
45	18Cr-8Ni	Forgings	SA-965	F304H	S30409	...	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	65	25	800	800	1200	650	HA-3	G5, G21, T4
2	65	25	800	NP	1200	650	HA-3	G21, T6
3	65	25	800	800	1200	650	HA-3	G5, G21, T4
4	65	25	800	NP	1200	650	HA-3	G21, T6
5	70	25	800	800	1200	650	HA-3	G5, G21, T4
6	70	25	800	NP	1200	650	HA-3	G21, T6
7	70	25	800	800	1200	NP	HA-3	G5, G21, T4
8	70	25	800	NP	1200	NP	HA-3	G21, T6
9	70	25	800	800	1200	650	HA-3	G5, G21, T4
10	70	25	800	NP	1200	650	HA-3	G21, T6
11	70	25	NP	800	NP	NP	HA-3	G5, W12
12	70	25	800	NP	1200	650	HA-3	G5, G21, G24, T4
13	70	25	800	NP	1200	650	HA-3	G21, G24, T6
14	70	25	800	800	1200	650	HA-3	G5, G21, T4, W12, W14
15	70	25	800	NP	1200	650	HA-3	G21, T6
16	70	25	800	NP	1200	650	HA-3	G5, G21, G24, T4
17	70	25	800	NP	1200	650	HA-3	G21, G24, T6
18	70	25	NP	800	NP	NP	HA-3	G5, W12
19	70	25	NP	800	1200	650	HA-3	G5, T4, W12, W14
20	70	25	NP	800	NP	NP	HA-3	G5, W12
21	70	25	800	800	1200	650	HA-3	G5, G21, G22, T4
22	70	25	800	NP	1200	650	HA-3	G21, G22, T6
23	70	25	NP	800	NP	NP	HA-3	G5, W12
24	70	25	NP	NP	1200	650	HA-3	G5, G24, T4
25	70	25	NP	NP	1200	650	HA-3	G24, T6
26	70	25	NP	800	NP	NP	HA-3	G5, W12
27	70	25	NP	800	NP	NP	HA-3	G5, W12
28	70	25	800	800	1200	NP	HA-3	G5, G21, G22, T4
29	70	30	1500	800	1500	650	HA-1	G5, G12, T7
30	70	30	1500	NP	1500	650	HA-1	G12, T8
31	70	30	1500	800	1500	NP	HA-1	G5, T7
32	70	30	1500	NP	1500	NP	HA-1	T8
33	70	30	NP	800	800	650	HA-3	G1, G5, G16, G17, G19
34	70	30	NP	NP	800	650	HA-3	G1, G19
35	70	30	1500	800	NP	NP	HA-1	G1, G5, G12, G16, G17, G19, H1, T6
36	70	30	1500	NP	1500	650	HA-1	G1, G12, G19, H1, T7
37	70	30	NP	NP	1500	650	HA-1	G1, G5, G12, G19, T6
38	70	30	NP	800	1500	650	HA-1	G5, G12, S9, T7
39	70	30	NP	NP	1500	650	HA-1	G12, S9, T8
40	70	30	NP	800	NP	NP	HA-3	G5, G16, G17, G19
41	70	30	NP	800	NP	NP	HA-1	G5, G16, G17, G19
42	70	30	1500	800	1500	650	HA-1	G5, G12, T7
43	70	30	1500	NP	1500	650	HA-1	G12, T8
44	70	30	NP	800	1500	NP	HA-1	G5, T7
45	70	30	NP	NP	1500	NP	HA-1	T8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	16.7	...	16.7	...	16.2	15.6	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
2	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
3	16.7	...	16.7	...	16.2	15.6	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
4	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
5	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
6	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
7	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
8	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
9	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
10	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
11	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
12	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.3	11.1	10.9	10.1
13	14.2	...	12.1	...	10.9	9.9	9.3	8.8	8.6	8.5	8.3	8.2	8.1	7.9
14	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
15	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
16	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.3	11.1	10.9	10.1
17	14.2	...	12.1	...	10.9	9.9	9.3	8.8	8.6	8.5	8.3	8.2	8.1	7.9
18	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
19	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
20	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
21	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
22	16.7	...	14.3	...	12.8	11.7	10.9	10.4	10.2	10.0	9.8	9.7	9.5	9.3
23	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
24	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.3	11.1	10.9	10.1
25	14.2	...	12.1	...	10.9	9.9	9.3	8.8	8.6	8.5	8.3	8.2	8.1	7.9
26	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
27	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
28	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	12.8	11.9
29	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
30	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
31	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
32	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
33	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	...	...
34	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	...	...
35	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
36	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
37	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
38	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
39	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
40	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	...	...
41	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	...	...
42	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
43	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
44	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	14.9	14.6
45	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
2	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
3	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
4	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
5	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
6	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
7	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
8	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
9	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
10	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	8.4	6.6	5.4	4.3	3.4	2.7	...	...	...	...	...	...	...	...	...
13	7.7	6.6	5.4	4.3	3.4	2.7	...	...	...	...	...	...	...	...	...
14	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
15	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
16	8.4	6.6	5.4	4.3	3.4	2.7	...	...	...	...	...	...	...	...	...
17	7.7	6.6	5.4	4.3	3.4	2.7	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
22	9.1	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	8.4	6.6	5.4	4.3	3.4	2.7	...	...	...	...	...	...	...	...	...
25	7.7	6.6	5.4	4.3	3.4	2.7	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	9.9	7.8	6.3	5.1	4.0	3.2	...	...	...	...	...	...	...	...	...
29	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
30	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
31	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
32	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	14.3	12.2	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7	...	...	...
36	10.6	10.4	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7	...	...	...
37	14.3	12.2	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7	...	...	...
38	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
39	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
43	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
44	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
45	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Plate	SA/EN 10028-7	X2CrNi18-9	...	...	≤3	8	1
2	18Cr-8Ni	Plate	SA/EN 10028-7	X2CrNi18-9	...	...	≤3	8	1
3	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	≤5	8	1
4	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	≤5	8	1
5	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	≤5	8	1
6	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	≤5	8	1
7	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...	...	8	1
8	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...	...	8	1
9	18Cr-8Ni	Smls. tube	SA-213	TP304H	S30409	...	...	8	1
10	18Cr-8Ni	Smls. tube	SA-213	TP304H	S30409	...	...	8	1
11	18Cr-8Ni	Plate	SA-240	302	S30200	...	...	8	1
12	18Cr-8Ni	Plate	SA-240	302	S30200	...	...	8	1
13	18Cr-8Ni	Plate	SA-240	304	S30400	...	...	8	1
14	18Cr-8Ni	Plate	SA-240	304	S30400	...	...	8	1
15	18Cr-8Ni	Plate	SA-240	304H	S30409	...	...	8	1
16	18Cr-8Ni	Plate	SA-240	304H	S30409	...	...	8	1
17	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
18	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
19	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
20	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
21	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
22	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
23	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
24	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
25	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304	S30400	...	...	8	1
26	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304	S30400	...	...	8	1
27	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	...	...	8	1
28	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	...	...	8	1
29	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304H	S30409	...	...	8	1
30	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304H	S30409	...	...	8	1
31	18Cr-8Ni	Wld. pipe	SA-312	TP304H	S30409	...	...	8	1
32	18Cr-8Ni	Wld. pipe	SA-312	TP304H	S30409	...	...	8	1
33	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	1	...	8	1
34	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	1	...	8	1
35	18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	1	...	8	1
(23)	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	<8	8	1
(23)	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	<8	8	1
38	18Cr-8Ni	Smls. pipe	SA-376	TP304H	S30409	...	...	8	1
39	18Cr-8Ni	Smls. pipe	SA-376	TP304H	S30409	...	...	8	1
40	18Cr-8Ni	Smls. & wld. fittings	SA-403	304	S30400	...	...	8	1
41	18Cr-8Ni	Smls. & wld. fittings	SA-403	304H	S30409	...	...	8	1
42	18Cr-8Ni	Wld. pipe	SA-409	TP304	S30400	...	...	8	1
43	18Cr-8Ni	Bar	SA-479	302	S30200	...	...	8	1
44	18Cr-8Ni	Bar	SA-479	302	S30200	...	...	8	1
45	18Cr-8Ni	Bar	SA-479	304	S30400	...	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	72.5	29	NP	NP	1022	650	HA-3	G5, G30, T4
2	72.5	29	NP	NP	1022	650	HA-3	G30, T6
3	75	30	1500	NP	1500	NP	HA-1	G12, T8
4	75	30	1500	800	1500	NP	HA-1	G5, G12, T7
5	75	30	1500	NP	1500	NP	HA-1	T8
6	75	30	1500	800	1500	NP	HA-1	G5, T7
7	75	30	1500	NP	1500	NP	HA-1	G12, T8
8	75	30	1500	800	1500	NP	HA-1	G5, G12, T7
9	75	30	1500	NP	1500	NP	HA-1	T8
10	75	30	1500	800	1500	NP	HA-1	G5, T7
11	75	30	NP	NP	750	650	HA-1	G5
12	75	30	NP	NP	750	650	HA-1	...
13	75	30	1500	NP	1500	650	HA-1	G12, T8
14	75	30	1500	800	1500	650	HA-1	G5, G12, H1, T7
15	75	30	1500	800	1500	NP	HA-1	G5, T7
16	75	30	1500	NP	1500	NP	HA-1	T8
17	75	30	1500	NP	NP	NP	HA-1	G12, T8, W13
18	75	30	1500	800	NP	NP	HA-1	G5, G12, T7, W12, W13
19	75	30	1500	NP	1500	650	HA-1	G3, G5, G12, G24, T7
20	75	30	1500	NP	1500	650	HA-1	G3, G12, G24, T8
21	75	30	1500	NP	NP	NP	HA-1	T8, W13
22	75	30	1500	800	NP	NP	HA-1	G5, T7, W12, W13
23	75	30	1500	NP	1500	NP	HA-1	G3, G5, G24, T7
24	75	30	1500	NP	1500	NP	HA-1	G3, G24, T8
25	75	30	1500	800	1500	650	HA-1	G5, G12, T7, W12, W13, W14
26	75	30	1500	NP	1500	650	HA-1	G12, T8, W13, W14
27	75	30	1500	NP	1500	650	HA-1	G3, G5, G12, G24, T7
28	75	30	1500	NP	1500	650	HA-1	G3, G12, G24, T8
29	75	30	1500	800	1500	NP	HA-1	G5, T7, W12, W13, W14
30	75	30	1500	NP	1500	NP	HA-1	T8, W13, W14
31	75	30	1500	NP	1500	NP	HA-1	G3, G5, G24, T7
32	75	30	1500	NP	1500	NP	HA-1	G3, G24, T8
33	75	30	NP	800	NP	NP	HA-1	G5, W12
34	75	30	NP	800	NP	NP	HA-1	G5, W12
35	75	30	NP	800	NP	NP	HA-1	G5, W12
36	75	30	1500	800	1500	650	HA-1	G5, G12, H1, S11, T7
37	75	30	1500	NP	1500	650	HA-1	G12, H1, S11, T8
38	75	30	1500	800	1500	NP	HA-1	G5, H1, T7
39	75	30	1500	NP	1500	NP	HA-1	H1, T8
40	75	30	NP	800	1500	650	HA-1	G5, G12, T7, W12, W14
41	75	30	NP	800	1500	NP	HA-1	G5, T7, W12, W14
42	75	30	NP	800	NP	NP	HA-1	G5, W12
43	75	30	NP	800	750	650	HA-1	G5, G24
44	75	30	NP	NP	750	650	HA-1	G22
45	75	30	1500	800	1500	650	HA-1	G5, G12, G22, T7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	19.3	...	19.3	...	19.3	18.3	17.1	16.2	15.9	15.6	15.4	15.2	14.9	14.9
2	19.3	...	16.5	...	14.9	13.6	12.6	12.0	11.8	11.6	11.4	11.2	11.0	10.8
3	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
4	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
5	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
6	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
7	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
8	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
9	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
10	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
11	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	...	...	...
12	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	...	...	...
13	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
14	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
15	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
16	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
17	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
18	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
19	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
20	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
21	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
22	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
23	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
24	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
25	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
26	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
27	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
28	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
29	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
30	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
31	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
32	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
33	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
34	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
35	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
36	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
37	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
38	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
39	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
40	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
41	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
42	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
43	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
44	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	...	...	...
45	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	9.9	7.8	6.3	...	...	...	...	...	...	...	...	...	...	...	...
2	10.6	7.8	6.3	...	...	...	...	...	...	...	...	...	...	...	...
3	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
4	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
5	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
6	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
7	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
8	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
9	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
10	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
14	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
15	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
16	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
17	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
18	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
19	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
20	9.0	8.8	8.6	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
21	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
22	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
23	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
24	9.0	8.8	8.6	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
25	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
26	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
27	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
28	9.0	8.8	8.6	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
29	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
30	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
31	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
32	9.0	8.8	8.6	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
37	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
38	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
39	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
40	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
41	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...

(23)

(23)

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Bar	SA-479	304	S30400	...	...	8	1
2	18Cr-8Ni	Bar	SA-479	304H	S30409	...	...	8	1
3	18Cr-8Ni	Bar	SA-479	304H	S30409	...	...	8	1
4	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	8	1
5	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	8	1
6	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	8	1
7	18Cr-8Ni	Wld. pipe	SA-813	TP304	S30400	...	...	8	1
8	18Cr-8Ni	Wld. pipe	SA-813	TP304H	S30409	...	...	8	1
9	18Cr-8Ni	Wld. pipe	SA-814	TP304	S30400	...	...	8	1
10	18Cr-8Ni	Wld. pipe	SA-814	TP304H	S30409	...	...	8	1
11	18Cr-8Ni	Bar	SA/JIS G4303	SUS302	...	...	...	8	1
12	18Cr-8Ni	Bar	SA/JIS G4303	SUS304	...	...	...	8	1
13	18Cr-8Ni	Plate	SA/EN 10028-7	X5CrNi18-10	...	...	≤3	8	1
14	18Cr-8Ni	Plate	SA/EN 10028-7	X5CrNi18-10	...	...	≤3	8	1
15	18Cr-8Ni	Castings	SA-351	CF3A	J92500	...	...	8	1
16	18Cr-8Ni	Castings	SA-351	CF3A	J92500	...	...	8	1
17	18Cr-8Ni	Castings	SA-351	CF8A	J92600	...	...	8	1
18	18Cr-8Ni	Castings	SA-351	CF8A	J92600	...	...	8	1
19	18Cr-8Ni	Cast pipe	SA-451	CPF3A	J92500	...	...	8	1
20	18Cr-8Ni	Cast pipe	SA-451	CPF8A	J92600	...	...	8	1
21	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...	>5	8	1
22	18Cr-8Ni-N	Forgings	SA-965	F304LN	S30453	...	...	8	1
23	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...	≤5	8	1
24	18Cr-8Ni-N	Smls. tube	SA-213	TP304LN	S30453	...	...	8	1
25	18Cr-8Ni-N	Plate	SA-240	304LN	S30453	...	...	8	1
26	18Cr-8Ni-N	Wld. tube	SA-249	TP304LN	S30453	...	...	8	1
27	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304LN	S30453	...	...	8	1
28	18Cr-8Ni-N	Smls. pipe	SA-376	TP304LN	S30453	...	...	8	1
29	18Cr-8Ni-N	Smls. & wld. fittings	SA-403	304LN	S30453	WP	...	8	1
30	18Cr-8Ni-N	Bar	SA-479	304LN	S30453	...	...	8	1
31	18Cr-8Ni-N	Wld. tube	SA-688	TP304LN	S30453	...	...	8	1
32	18Cr-8Ni-N	Wld. pipe	SA-813	TP304LN	S30453	...	...	8	1
33	18Cr-8Ni-N	Wld. pipe	SA-814	TP304LN	S30453	...	...	8	1
34	18Cr-8Ni-N	Forgings	SA-182	F304N	S30451	...	...	8	1
35	18Cr-8Ni-N	Smls. tube	SA-213	TP304N	S30451	...	...	8	1
36	18Cr-8Ni-N	Smls. tube	SA-213	TP304N	S30451	...	...	8	1
37	18Cr-8Ni-N	Plate	SA-240	304N	S30451	...	...	8	1
38	18Cr-8Ni-N	Plate	SA-240	304N	S30451	...	...	8	1
39	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
40	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
41	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
42	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
43	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
44	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304N	S30451	...	...	8	1
45	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304N	S30451	...	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	1500	NP	1500	650	HA-1	G12, G22, T8
2	75	30	1500	800	1500	NP	HA-1	G5, G22, T7
3	75	30	1500	NP	1500	NP	HA-1	G22, T8
4	75	30	NP	800	NP	NP	HA-1	G5, W12
5	75	30	NP	NP	1500	650	HA-1	G5, G12, G24, T7
6	75	30	NP	NP	1500	650	HA-1	G12, G24, T8
7	75	30	NP	800	NP	NP	HA-1	G5, W12
8	75	30	NP	800	NP	NP	HA-1	G5, W12
9	75	30	NP	800	NP	NP	HA-1	G5, W12
10	75	30	NP	800	NP	NP	HA-1	G5, W12
11	75	30	NP	800	750	NP	HA-1	G5, G24
12	75	30	1500	800	1500	NP	HA-1	G5, G12, G22, T7
13	75	31	NP	NP	1022	650	HA-1	G5, G12, G30, H1, T7
14	75	31	NP	NP	1022	650	HA-1	G12, G30
15	77	35	NP	650	700	650	HA-3	G1, G5, G16, G17, G19
16	77	35	NP	NP	700	650	HA-3	G1, G19
17	77	35	NP	650	650	650	HA-1	G1, G5, G16, G17, G19
18	77	35	NP	NP	650	650	HA-1	G1, G19
19	77	35	NP	650	NP	NP	HA-3	G5, G16, G17, G19
20	77	35	NP	650	NP	NP	HA-1	G5, G16, G17, G19
21	70	30	NP	800	800	NP	HA-1	G5
22	70	30	NP	800	800	NP	HA-1	G5
23	75	30	NP	800	800	NP	HA-1	G5
24	75	30	NP	800	800	NP	HA-1	G5
25	75	30	NP	800	800	NP	HA-1	G5
26	75	30	NP	800	800	NP	HA-1	G5, W12, W14
27	75	30	NP	800	800	NP	HA-1	G5, W12, W14
28	75	30	NP	800	800	NP	HA-1	G5
29	75	30	NP	800	800	NP	HA-1	G5, W12, W14
30	75	30	NP	800	800	NP	HA-1	G5
31	75	30	NP	800	800	NP	HA-1	G5, W12, W14
32	75	30	NP	800	800	NP	HA-1	G5, W12, W14
33	75	30	NP	800	800	NP	HA-1	G5, W12, W14
34	80	35	NP	800	NP	NP	HA-1	G5
35	80	35	1200	800	1200	NP	HA-1	G5, G12, T7
36	80	35	1200	NP	1200	NP	HA-1	G12, T8
37	80	35	NP	800	1200	650	HA-1	G5, G12, T7
38	80	35	NP	NP	1200	650	HA-1	G12, T8
39	80	35	1200	NP	NP	NP	HA-1	G5, G12, T7, W13
40	80	35	1200	NP	NP	NP	HA-1	G12, T8, W13
41	80	35	1200	NP	NP	NP	HA-1	G3, G5, G12, T5
42	80	35	1200	NP	1200	650	HA-1	G3, G12, G24, T8
43	80	35	NP	NP	1200	650	HA-1	G5, G12, G24, T5
44	80	35	1200	800	1200	650	HA-1	G5, G12, T7, W12, W13, W14
45	80	35	1200	NP	1200	650	HA-1	G12, T8, W13, W14

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
2	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
3	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
4	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
5	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
6	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
7	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
8	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
9	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
10	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
11	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
12	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
13	20.3	...	20.3	...	20.3	18.9	17.7	16.8	16.4	16.1	15.7	15.4	15.1	14.8
14	20.3	...	16.9	...	15.2	14.0	13.1	12.5	12.2	11.9	11.7	11.4	11.2	11.0
15	22.0	...	20.8	...	19.4	18.8	18.6	18.6	18.6	18.5	...	...	...	...
16	22.0	...	19.5	...	17.5	16.1	15.1	14.3	14.0	13.7	...	...	...	...
17	22.0	...	20.8	...	19.4	18.8	18.6	18.6	18.6	...	...	...	...	...
18	22.0	...	19.5	...	17.5	16.1	15.1	14.3	14.0	...	...	...	...	...
19	22.0	...	20.8	...	19.4	18.8	18.6	18.6	18.6	...	...	...	...	...
20	22.0	...	20.8	...	19.4	18.8	18.6	18.6	18.6	...	...	...	...	...
21	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	...	...
22	20.0	...	18.9	...	17.7	17.1	16.9	16.6	16.2	15.8	15.5	15.2	...	...
23	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
24	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
25	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
26	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
27	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
28	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
29	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
30	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
31	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
32	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
33	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
34	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
35	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
36	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8
37	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
38	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8
39	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
40	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8
41	19.4	...	19.4	...	18.5	17.3	16.0	15.2	14.9	14.6	14.4	14.1	13.8	13.6
42	19.4	...	16.2	...	14.2	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.0
43	19.4	...	19.4	...	18.5	17.3	16.0	15.2	14.9	14.6	14.4	14.1	13.8	13.6
44	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
45	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
2	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
3	10.6	10.4	10.1	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
6	9.0	8.8	8.6	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
13	14.5	14.2	12.4	...	...	...	...	...	...	...	...	...	...	...	...
14	10.7	10.5	10.3	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
36	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
37	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
38	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
39	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
40	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
41	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
42	9.8	9.6	9.4	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
43	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
44	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
45	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Size/Thickness, in.	Group
					Design/UNS No.	Condition/ Temper	P-No.
1	18Cr-8Ni-N	Wld. pipe	SA-312	TP304N	S30451 ...	...	8 1
2	18Cr-8Ni-N	Wld. pipe	SA-312	TP304N	S30451 ...	...	8 1
3	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451 1	...	8 1
4	18Cr-8Ni-N	Smls. pipe	SA-376	TP304N	S30451 ...	...	8 1
5	18Cr-8Ni-N	Smls. pipe	SA-376	TP304N	S30451 ...	...	8 1
6	18Cr-8Ni-N	Smls. & wld. fittings	SA-403	304N	S30451 ...	...	8 1
7	18Cr-8Ni-N	Bar	SA-479	304N	S30451 ...	...	8 1
8	18Cr-8Ni-N	Bar	SA-479	304N	S30451 ...	...	8 1
9	18Cr-8Ni-N	Wld. tube	SA-688	TP304N	S30451 ...	...	8 1
10	18Cr-8Ni-N	Wld. tube	SA-688	TP304N	S30451 ...	...	8 1
11	18Cr-8Ni-N	Wld. tube	SA-688	TP304N	S30451 ...	...	8 1
12	18Cr-8Ni-N	Wld. pipe	SA-813	TP304N	S30451 ...	...	8 1
13	18Cr-8Ni-N	Wld. pipe	SA-814	TP304N	S30451 ...	...	8 1
14	18Cr-8Ni-N	Forgings	SA-965	F304N	S30451 ...	...	8 1
15	18Cr-8Ni-N	Forgings	SA-965	F304N	S30451 ...	...	8 1
16	18Cr-8Ni-N	Plate	SA/EN 10028-7	X2CrNiN18-10	...	≤3	8 1
17	18Cr-8Ni-N	Plate	SA/EN 10028-7	X5CrNiN19-9	...	≤3	8 1
18	18Cr-8Ni-N	Plate	SA/EN 10028-7	X5CrNiN19-9	...	≤3	8 1
19	18Cr-8Ni-4Si-N	Bar	SA-479	...	S21800 ...	...	8 3
20	18Cr-9Ni-3Cu-Cb-N	Smls. tube	SA-213	...	S30432 ...	...	8 1
21	18Cr-9Ni-3Cu-Cb-N	Smls. tube	SA-213	...	S30432 ...	...	8 1
22	18Cr-10Ni-Cb	Forgings	SA-965	F348H	S34809 ...	...	8 1
23	18Cr-10Ni-Cb	Forgings	SA-965	F348H	S34809 ...	...	8 1
24	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710 ...	...	8 1
25	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710 ...	...	8 1
26	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710 ...	...	8 1
27	18Cr-10Ni-Cb	Cast pipe	SA-451	CPF8C	J92710 ...	...	8 1
28	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700 ...	>5	8 1
29	18Cr-10Ni-Cb	Forgings	SA-965	F347	S34700 ...	...	8 1
30	18Cr-10Ni-Cb	Forgings	SA-965	F347	S34700 ...	...	8 1
31	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709 ...	>5	8 1
32	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709 ...	>5	8 1
33	18Cr-10Ni-Cb	Forgings	SA-965	F347H	S34709 ...	...	8 1
34	18Cr-10Ni-Cb	Forgings	SA-965	F347H	S34709 ...	...	8 1
35	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800 ...	>5	8 1
36	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800 ...	>5	8 1
37	18Cr-10Ni-Cb	Forgings	SA-965	F348	S34800 ...	...	8 1
38	18Cr-10Ni-Cb	Forgings	SA-965	F348	S34800 ...	...	8 1
39	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809 ...	>5	8 1
40	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809 ...	>5	8 1
41	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700 ...	≤5	8 1
42	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700 ...	≤5	8 1
43	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347	S34700 ...	...	8 1
44	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347	S34700 ...	...	8 1
45	18Cr-10Ni-Cb	Plate	SA-240	347	S34700 ...	...	8 1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	80	35	1200	NP	1200	650	HA-1	G3, G5, G12, G24, T5
2	80	35	1200	NP	1200	650	HA-1	G3, G12, G24, T8
3	80	35	NP	800	NP	NP	HA-1	G5, W12
4	80	35	1200	800	1200	650	HA-1	G5, G12, H1, T7
5	80	35	1200	NP	1200	650	HA-1	G12, H1, T8
6	80	35	NP	800	1200	650	HA-1	G5, T7, W12, W14
7	80	35	1200	NP	NP	NP	HA-1	G12, T8
8	80	35	1200	800	NP	NP	HA-1	G5, G12, T7
9	80	35	NP	800	NP	NP	HA-1	G5, W12
10	80	35	NP	NP	1200	650	HA-1	G5, G12, G24, T7
11	80	35	NP	NP	1200	650	HA-1	G12, G24, T8
12	80	35	NP	800	NP	NP	HA-1	G5, W12
13	80	35	NP	800	NP	NP	HA-1	G5, W12
14	80	35	NP	800	1200	650	HA-1	G5, G12, T7
15	80	35	NP	NP	1200	650	HA-1	G12, T8
16	80	39	NP	NP	800	650	HA-1	G5, G30
17	80	39	NP	NP	1022	650	HA-1	G5, G12, G30, T7
18	80	39	NP	NP	1022	650	HA-1	G12, G30
19	95	50	NP	800	NP	NP	HA-6	...
20	86	34	1500	NP	1500	NP	HA-2	G5, T12
21	86	34	1500	NP	1500	NP	HA-2	T12
22	65	25	NP	NP	1500	NP	HA-2	G5, H2, T9
23	65	25	NP	NP	1500	NP	HA-2	H2, T9
24	70	30	NP	800	NP	NP	HA-2	G5, G16, G17, G19
25	70	30	NP	NP	1500	650	HA-2	G1, G5, G12, G19, T7
26	70	30	NP	NP	1500	650	HA-2	G1, G12, G19, T7
27	70	30	NP	800	NP	NP	HA-2	G5, G16, G17, G19
28	70	30	1500	800	1500	650	HA-2	G5, G12, T7
29	70	30	1500	800	1500	650	HA-2	G5, G12, H1, T7
30	70	30	1500	NP	1500	650	HA-2	G12, H1, T7
31	70	30	1500	NP	NP	NP	HA-2	H2, T9
32	70	30	1500	800	1500	NP	HA-2	G5, H2, T8
33	70	30	NP	NP	1500	NP	HA-2	H2, T9
34	70	30	NP	800	1500	NP	HA-2	G5, H2, T8
35	70	30	1500	NP	NP	NP	HA-2	T7
36	70	30	1500	800	1500	650	HA-2	G5, G12, T7
37	70	30	NP	NP	1500	650	HA-2	G5, G12, H1, T7
38	70	30	NP	NP	1500	650	HA-2	G12, H1, T7
39	70	30	1500	NP	NP	NP	HA-2	T9
40	70	30	1500	800	1500	NP	HA-2	G5, T8
41	75	30	1500	800	1500	NP	HA-2	G5, G12, H1, T6
42	75	30	1500	NP	1500	NP	HA-2	G12, H1, T7
43	75	30	1500	800	1500	NP	HA-2	G5, G12, H1, T6
44	75	30	1500	NP	1500	NP	HA-2	G12, H1, T7
45	75	30	1500	800	1500	650	HA-2	G5, G12, T6

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	19.4	...	19.4	...	18.5	17.3	16.0	15.2	14.9	14.6	14.4	14.1	13.8	13.6
2	19.4	...	16.2	...	14.2	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.0
3	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
4	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
5	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8
6	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
7	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8
8	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
9	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
10	19.4	...	19.4	...	18.5	17.3	16.0	15.2	14.9	14.6	14.4	14.1	13.8	13.6
11	19.4	...	16.2	...	14.2	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.0
12	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
13	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
14	22.9	...	22.9	...	21.7	20.3	18.9	17.9	17.5	17.2	16.9	16.6	16.3	16.0
15	22.9	...	19.1	...	16.7	15.1	14.0	13.3	13.0	12.8	12.5	12.3	12.1	11.8
16	22.8	...	22.8	...	22.3	21.4	21.1	21.1	21.1	20.7	20.2	19.8	...	...
17	22.8	...	22.8	...	22.8	22.7	21.1	20.0	19.6	19.3	18.9	18.6	18.2	17.8
18	22.8	...	21.3	...	18.7	16.8	15.6	14.8	14.5	14.3	14.0	13.8	13.5	13.2
19	27.1	...	25.9	...	22.1	19.8	18.4	17.6	17.3	17.1	16.9	16.8	...	...
20	22.7	...	22.7	...	22.7	22.7	21.9	21.1	20.7	20.4	20.1	19.8	19.5	19.2
21	22.7	...	19.8	...	18.2	17.1	16.3	15.6	15.3	15.1	14.9	14.6	14.4	14.2
22	16.7	...	16.7	...	16.3	15.4	14.9	14.6	14.6	14.6	14.6	14.6	14.5	14.5
23	16.7	...	15.3	...	14.3	13.3	12.5	11.9	11.7	11.5	11.4	11.3	11.2	11.2
24	20.0	...	19.1	...	17.6	16.6	16.0	15.7	15.7	15.7	15.7	15.7	...	...
25	20.0	...	19.1	...	17.6	16.6	16.0	15.8	15.7	15.7	15.7	15.7	15.7	15.6
26	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
27	20.0	...	19.1	...	17.6	16.6	16.0	15.7	15.7	15.7	15.7	15.7	...	...
28	20.0	...	19.1	...	17.6	16.6	16.0	15.8	15.7	15.7	15.7	15.7	15.7	15.6
29	20.0	...	19.1	...	17.6	16.6	16.0	15.8	15.7	15.7	15.7	15.7	15.7	15.6
30	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
31	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
32	20.0	...	19.1	...	17.6	16.6	16.0	15.7	15.7	15.7	15.7	15.7	15.7	15.6
33	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
34	20.0	...	19.1	...	17.6	16.6	16.0	15.7	15.7	15.7	15.7	15.7	15.7	15.6
35	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
36	20.0	...	19.1	...	17.6	16.6	16.0	15.8	15.7	15.7	15.7	15.7	15.7	15.6
37	20.0	...	19.1	...	17.6	16.6	16.0	15.8	15.7	15.7	15.7	15.7	15.7	15.6
38	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
39	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
40	20.0	...	19.1	...	17.6	16.6	16.0	15.7	15.7	15.7	15.7	15.7	15.7	15.6
41	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
42	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
43	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
44	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
45	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
2	9.8	9.6	9.4	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
5	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
6	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
7	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
8	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
11	9.8	9.6	9.4	8.3	6.6	5.2	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
15	11.6	11.3	11.0	9.8	7.7	6.1	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	17.4	17.0	12.4	...	...	...	...	...	...	...	...	...	...	...	...
18	12.9	12.6	12.3	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	18.9	18.6	18.3	18.1	14.7	11.4	8.7	6.5	4.7	3.3	2.2	1.5	...	...	...
21	14.0	13.8	13.6	13.4	13.2	11.4	8.7	6.5	4.7	3.3	2.2	1.5	...	...	...
22	14.4	14.2	14.0	13.7	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
23	11.2	11.2	11.1	11.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	15.5	15.3	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
26	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	15.5	15.3	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
29	15.5	15.3	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
30	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
31	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
32	15.5	15.3	15.1	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
33	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
34	15.5	15.3	15.1	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
35	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
36	15.5	15.3	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
37	15.5	15.3	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
38	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
39	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
40	15.5	15.3	15.1	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
41	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
42	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
43	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
44	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
45	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design./UNS No.	Condition/ Temper		
1	18Cr-10Ni-Cb	Plate	SA-240	347	S34700	...	...	8 1
2	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8 1
3	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8 1
4	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8 1
5	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8 1
6	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347	S34700	...	...	8 1
7	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347	S34700	...	...	8 1
8	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347	S34700	...	...	8 1
9	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347	S34700	...	...	8 1
10	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	1	...	8 1
11	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347	S34700	...	...	8 1
12	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347	S34700	...	...	8 1
13	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	347	S34700	...	...	8 1
14	18Cr-10Ni-Cb	Wld. pipe	SA-409	TP347	S34700	...	...	8 1
15	18Cr-10Ni-Cb	Bar	SA-479	347	S34700	...	...	8 1
16	18Cr-10Ni-Cb	Bar	SA-479	347	S34700	...	...	8 1
17	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347	S34700	...	...	8 1
18	18Cr-10Ni-Cb	Bar	SA/JIS G4303	SUS347	...	...	...	8 1
19	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	≤5	8 1
20	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	≤5	8 1
21	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347H	S34709	...	...	8 1
22	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347H	S34709	...	...	8 1
23	18Cr-10Ni-Cb	Plate	SA-240	347H	S34709	...	...	8 1
24	18Cr-10Ni-Cb	Plate	SA-240	347H	S34709	...	...	8 1
25	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8 1
26	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8 1
27	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8 1
28	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8 1
29	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347H	S34709	...	...	8 1
30	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347H	S34709	...	...	8 1
31	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347H	S34709	...	...	8 1
32	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347H	S34709	...	...	8 1
33	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347H	S34709	...	...	8 1
34	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347H	S34709	...	...	8 1
35	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	347H	S34709	...	...	8 1
36	18Cr-10Ni-Cb	Bar	SA-479	347H	S34709	...	...	8 1
37	18Cr-10Ni-Cb	Bar	SA-479	347H	S34709	...	...	8 1
38	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347H	S34709	...	...	8 1
39	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP347H	S34709	...	...	8 1
40	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347LN	S34751	...	...	8 1
41	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347LN	S34751	...	...	8 1
42	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347LN	S34751	...	...	8 1
43	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347LN	S34751	...	...	8 1
44	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	≤5	8 1
45	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	≤5	8 1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	1500	NP	1500	650	HA-2	G12, T7
2	75	30	1500	NP	NP	NP	HA-2	G12, T7, W13
3	75	30	1500	800	NP	NP	HA-2	G5, G12, T6, W12, W13
4	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T6
5	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T7
6	75	30	1500	800	1500	650	HA-2	G5, G12, T6, W12, W13, W14
7	75	30	1500	NP	1500	650	HA-2	G12, T7, W13, W14
8	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T6
9	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T7
10	75	30	NP	800	NP	NP	HA-2	G5, H1, W12
11	75	30	1500	800	1500	650	HA-2	G5, G12, H1, T6
12	75	30	1500	NP	1500	650	HA-2	G12, H1, T7
13	75	30	NP	800	1500	650	HA-2	G5, G12, T6, W12, W14
14	75	30	NP	800	NP	NP	HA-2	G5, H1, W12
15	75	30	1500	800	1500	650	HA-2	G5, G12, G22, T6
16	75	30	1500	NP	1500	650	HA-2	G12, G22, T7
17	75	30	NP	800	NP	NP	HA-2	G5, H1, W12
18	75	30	1500	800	1500	NP	HA-2	G5, G12, G22, T6
19	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
20	75	30	1500	NP	1500	NP	HA-2	H2, T9
21	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
22	75	30	1500	NP	1500	NP	HA-2	H2, T9
23	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
24	75	30	1500	NP	1500	NP	HA-2	H2, T9
25	75	30	1500	800	NP	NP	HA-2	G5, T8, W12, W13
26	75	30	1500	NP	NP	NP	HA-2	T9, W13
27	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, T8
28	75	30	1500	NP	1500	NP	HA-2	G3, G24, T9
29	75	30	1500	800	1500	NP	HA-2	G5, H2, T8, W12, W13, W14
30	75	30	1500	NP	1500	NP	HA-2	H2, T9, W13, W14
31	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, H2, T8
32	75	30	1500	NP	1500	NP	HA-2	G3, G24, H2, T9
33	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
34	75	30	1500	NP	1500	NP	HA-2	H2, T9
35	75	30	NP	800	1500	NP	HA-2	G5, H2, T8, W12, W14
36	75	30	1500	800	NP	NP	HA-2	G5, H2, T8
37	75	30	1500	NP	NP	NP	HA-2	H2, T9
38	75	30	NP	800	NP	NP	HA-2	G5, H2, W12
39	75	30	NP	800	NP	NP	HA-2	G5, W12
40	75	30	NP	NP	1100	NP	HA-2	G5, T8
41	75	30	NP	NP	1100	NP	HA-2	...
42	75	30	NP	NP	1100	NP	HA-2	G5, T8
43	75	30	NP	NP	1100	NP	HA-2	...
44	75	30	1500	800	1500	NP	HA-2	G5, G12, T6
45	75	30	1500	NP	1500	NP	HA-2	G12, T7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
2	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
3	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
4	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
5	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
6	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
7	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
8	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
9	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
10	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
11	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
12	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
13	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
14	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
15	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
16	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
17	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
18	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
19	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
20	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
21	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
22	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
23	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
24	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
25	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
26	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
27	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
28	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
29	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
30	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
31	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
32	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
33	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
34	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
35	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
36	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
37	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
38	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
39	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
40	20.0	...	20.0	...	19.1	17.8	16.9	16.5	16.4	16.3	16.3	16.3	16.3	16.2
41	20.0	...	17.7	...	16.0	14.6	13.6	12.9	12.7	12.6	12.5	12.4	12.4	12.4
42	20.0	...	20.0	...	19.1	17.8	16.9	16.5	16.4	16.3	16.3	16.3	16.3	16.2
43	20.0	...	17.7	...	16.0	14.6	13.6	12.9	12.7	12.6	12.5	12.4	12.4	12.4
44	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
45	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
2	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
3	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
4	14.1	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
5	11.4	11.4	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
6	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
7	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
8	14.1	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
9	11.4	11.4	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
12	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
13	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
16	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
19	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
20	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
21	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
22	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
23	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
24	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
25	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
26	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
27	14.1	14.0	13.7	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
28	11.4	11.4	11.4	11.3	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
29	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
30	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
31	14.1	14.0	13.7	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
32	11.4	11.4	11.4	11.3	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
33	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
34	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
35	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
36	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
37	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	16.1	15.8	15.6	13.2	...	...	...	...	...	...	...	...	...	...	...
41	12.4	12.4	12.3	12.2	...	...	...	...	...	...	...	...	...	...	...
42	16.1	15.8	15.6	13.2	...	...	...	...	...	...	...	...	...	...	...
43	12.4	12.4	12.3	12.2	...	...	...	...	...	...	...	...	...	...	...
44	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
45	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Group P-No.	No.
1	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348	S34800	...	...	8	1
2	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348	S34800	...	...	8	1
3	18Cr-10Ni-Cb	Plate	SA-240	348	S34800	...	...	8	1
4	18Cr-10Ni-Cb	Plate	SA-240	348	S34800	...	...	8	1
5	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
6	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
7	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
8	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
9	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP348	S34800	...	...	8	1
10	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP348	S34800	...	...	8	1
11	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348	S34800	...	...	8	1
12	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348	S34800	...	...	8	1
13	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	1	...	8	1
14	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP348	S34800	...	...	8	1
15	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP348	S34800	...	...	8	1
16	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	348	S34800	...	...	8	1
17	18Cr-10Ni-Cb	Wld. pipe	SA-409	TP348	S34800	...	...	8	1
18	18Cr-10Ni-Cb	Bar	SA-479	348	S34800	...	...	8	1
19	18Cr-10Ni-Cb	Bar	SA-479	348	S34800	...	...	8	1
20	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348	S34800	...	...	8	1
21	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348	S34800	...	...	8	1
22	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	≤5	8	1
23	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	≤5	8	1
24	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348H	S34809	...	...	8	1
25	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348H	S34809	...	...	8	1
26	18Cr-10Ni-Cb	Plate	SA-240	348H	S34809	...	...	8	1
27	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
28	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
29	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
30	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
31	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP348H	S34809	...	...	8	1
32	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP348H	S34809	...	...	8	1
33	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348H	S34809	...	...	8	1
34	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348H	S34809	...	...	8	1
35	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	348H	S34809	...	...	8	1
36	18Cr-10Ni-Cb	Bar	SA-479	348H	S34809	...	...	8	1
37	18Cr-10Ni-Cb	Bar	SA-479	348H	S34809	...	...	8	1
38	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348H	S34809	...	...	8	1
39	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348H	S34809	...	...	8	1
40	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347HFG	S34710	...	...	8	1
41	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347HFG	S34710	...	...	8	1
42	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	> ³ / ₈	8	1
43	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	> ³ / ₈	8	1
44	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	> ³ / ₈	8	1
45	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	> ³ / ₈	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	1500	800	1500	NP	HA-2	G5, G12, T6
2	75	30	1500	NP	1500	NP	HA-2	G12, T7
3	75	30	NP	800	1500	650	HA-2	G5, G12, T6
4	75	30	NP	NP	1500	650	HA-2	G12, T7
5	75	30	1500	NP	NP	NP	HA-2	G12, T7, W13
6	75	30	1500	800	NP	NP	HA-2	G5, G12, T6, W12, W13
7	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T6
8	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T7
9	75	30	1500	800	1500	650	HA-2	G5, G12, T6, W12, W14
10	75	30	1500	NP	1500	650	HA-2	G12, T7
11	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T6
12	75	30	NP	NP	1500	650	HA-2	G12, G24, T7
13	75	30	NP	800	NP	NP	HA-2	G5, W12
14	75	30	1500	800	1500	650	HA-2	G5, G12, H1, T6
15	75	30	1500	NP	1500	650	HA-2	G12, H1, T7
16	75	30	NP	800	1500	650	HA-2	G5, G12, H2, T6, W12, W14
17	75	30	NP	800	NP	NP	HA-2	G5, W12
18	75	30	1500	800	1500	650	HA-2	G5, G12, G22, H1, T6
19	75	30	1500	NP	1500	650	HA-2	G12, G22, H1, T7
20	75	30	NP	800	NP	NP	HA-2	G5, H1, W12
21	75	30	NP	800	NP	NP	HA-2	G5, W12
22	75	30	1500	800	1500	NP	HA-2	G5, T8
23	75	30	1500	NP	1500	NP	HA-2	T9
24	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
25	75	30	1500	NP	1500	NP	HA-2	H2, T9
26	75	30	NP	800	NP	NP	HA-2	G5, H2
27	75	30	1500	800	NP	NP	HA-2	G5, T8, W12, W13
28	75	30	1500	NP	NP	NP	HA-2	T9, W13
29	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, T8
30	75	30	1500	NP	1500	NP	HA-2	G3, G24, T9
31	75	30	1500	800	1500	NP	HA-2	G5, H2, T8, W12, W14
32	75	30	1500	NP	1500	NP	HA-2	H2, T9
33	75	30	NP	NP	1500	NP	HA-2	G5, G24, H2, T8
34	75	30	NP	NP	1500	NP	HA-2	G24, H2, T9
35	75	30	NP	800	1500	NP	HA-2	G5, H2, T8, W12, W14
36	75	30	1500	800	NP	NP	HA-2	G5, H2, T8
37	75	30	1500	NP	NP	NP	HA-2	H2, T9
38	75	30	NP	800	NP	NP	HA-2	G5, H2, W12
39	75	30	NP	800	NP	NP	HA-2	G5, W12
40	80	30	1350	NP	NP	NP	HA-2	G5, T9
41	80	30	1350	NP	NP	NP	HA-2	T9
42	70	25	1500	800	1500	NP	HA-2	G5, G12, T7
43	70	25	1500	NP	1500	NP	HA-2	G12, T7
44	70	25	1500	800	1500	NP	HA-2	G5, G12, T7, W12, W13, W14
45	70	25	1500	NP	1500	NP	HA-2	G12, T7, W13, W14

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
2	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
3	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
4	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
5	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
6	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
7	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
8	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
9	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
10	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
11	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
12	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
13	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
14	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
15	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
16	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
17	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
18	20.0	...	20.0	...	18.8	17.8	17.2	16.9	16.8	16.8	16.8	16.8	16.8	16.7
19	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
20	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
21	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
22	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
23	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
24	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
25	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
26	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
27	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
28	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
29	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
30	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
31	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
32	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
33	17.0	...	17.0	...	16.0	15.1	14.6	14.3	14.3	14.3	14.3	14.3	14.3	14.2
34	17.0	...	15.6	...	14.6	13.6	12.8	12.2	11.9	11.8	11.6	11.5	11.5	11.4
35	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
36	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	16.8	16.7
37	20.0	...	18.4	...	17.1	16.0	15.0	14.3	14.0	13.8	13.7	13.6	13.5	13.4
38	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
39	20.0	...	20.0	...	18.8	17.8	17.1	16.9	16.8	16.8	16.8	16.8	...	...
40	20.0	...	20.0	...	20.0	19.9	19.3	19.1	19.0	18.9	18.8	18.6	18.3	18.1
41	20.0	...	18.1	...	16.9	15.9	15.2	14.6	14.4	14.1	13.9	13.8	13.6	13.4
42	16.7	16.7	16.7	16.7	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	13.9	13.8
43	16.7	15.6	15.0	14.4	13.8	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.2
44	16.7	16.7	16.7	16.7	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	13.9	13.8
45	16.7	15.6	15.0	14.4	13.8	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
2	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
3	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
4	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
5	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
6	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
7	14.1	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
8	11.4	11.4	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
9	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
10	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
11	14.1	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
12	11.4	11.4	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.77	0.68	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
15	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
16	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	16.6	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
19	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
23	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
24	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
25	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
28	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
29	14.1	14.0	13.7	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
30	11.4	11.4	11.4	11.3	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
31	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
32	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
33	14.1	14.0	13.7	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
34	11.4	11.4	11.4	11.3	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1	...	...	...
35	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
36	16.6	16.4	16.2	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
37	13.4	13.4	13.4	13.3	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	17.9	17.7	17.5	16.6	12.8	9.7	7.3	5.4	4.0	...	...	...	...	...	...
41	13.3	13.1	13.0	12.8	12.8	9.7	7.3	5.4	4.0	...	...	...	...	...	...
42	13.6	13.5	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
43	10.1	10.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
44	13.6	13.5	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
45	10.1	10.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$>\frac{3}{8}$	8	1
2	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$>\frac{3}{8}$	8	1
3	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	$>\frac{3}{16}$	8	1
4	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	$>\frac{3}{16}$	8	1
5	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	$>\frac{3}{16}$	8	1
6	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	$>\frac{3}{16}$	8	1
7	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	$>\frac{3}{8}$	8	1
8	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	>5	8	1
9	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	>5	8	1
10	18Cr-10Ni-Ti	Forgings	SA-965	F321	S32100	...	...	8	1
11	18Cr-10Ni-Ti	Forgings	SA-965	F321	S32100	...	...	8	1
12	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	>5	8	1
13	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	>5	8	1
14	18Cr-10Ni-Ti	Forgings	SA-965	F321H	S32109	...	...	8	1
15	18Cr-10Ni-Ti	Forgings	SA-965	F321H	S32109	...	...	8	1
16	18Cr-10Ni-Ti	Plate	SA/EN 10028-7	X6CrNiTi18-10	...	...	≤ 3	8	1
17	18Cr-10Ni-Ti	Plate	SA/EN 10028-7	X6CrNiTi18-10	...	...	≤ 3	8	1
18	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	≤ 5	8	1
19	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	≤ 5	8	1
20	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	≤ 5	8	1
21	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...	...	8	1
22	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...	...	8	1
23	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...	...	8	1
24	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...	...	8	1
25	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...	...	8	1
26	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...	...	8	1
27	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
28	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
29	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
30	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
31	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
32	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
33	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
34	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
35	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	1	...	8	1
36	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
37	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
38	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
39	18Cr-10Ni-Ti	Smls. & wld. fittings	SA-403	321	S32100	...	...	8	1
40	18Cr-10Ni-Ti	Wld. pipe	SA-409	TP321	S32100	...	...	8	1
41	18Cr-10Ni-Ti	Bar	SA-479	321	S32100	...	...	8	1
42	18Cr-10Ni-Ti	Bar	SA-479	321	S32100	...	...	8	1
43	18Cr-10Ni-Ti	Bar	SA-479	321	S32100	...	...	8	1
44	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321	S32100	...	...	8	1
45	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321	S32100	...	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	70	25	NP	800	1500	650	HA-2	G5, G12, H1, T7
2	70	25	NP	NP	1500	650	HA-2	G12, H1, T7
3	70	25	1500	800	1500	NP	HA-2	G5, T8
4	70	25	1500	NP	1500	NP	HA-2	T8
5	70	25	1500	800	1500	NP	HA-2	G5, T8, W12, W13, W14
6	70	25	1500	NP	1500	NP	HA-2	T8, W13, W14
7	70	25	NP	800	1500	NP	HA-2	G5, H2, T8
8	70	30	1500	800	1500	NP	HA-2	G5, G12, T6
9	70	30	1500	NP	1500	NP	HA-2	G12, T7
10	70	30	1500	800	1500	650	HA-2	G5, G12, H1, T6
11	70	30	1500	NP	1500	650	HA-2	G12, H1, T7
12	70	30	1500	800	1500	NP	HA-2	G5, H2, T8
13	70	30	1500	NP	1500	NP	HA-2	H2, T8
14	70	30	NP	800	1500	NP	HA-2	G5, H2, T8
15	70	30	NP	NP	1500	NP	HA-2	H2, T8
16	73	29	NP	NP	1022	650	HA-2	G5, G12, G30, T6
17	73	29	NP	NP	1022	650	HA-2	G12, G30, T7
18	75	30	1500	NP	NP	NP	HA-2	G5, G12, T7
19	75	30	1500	NP	1500	650	HA-2	G12, T7
20	75	30	NP	800	1500	650	HA-2	G5, G12, T6
21	75	30	1500	NP	NP	NP	HA-2	G5, G12, T7
22	75	30	1500	NP	1500	NP	HA-2	G12, T7
23	75	30	NP	800	1500	NP	HA-2	G5, G12, T6
24	75	30	1500	NP	NP	NP	HA-2	G5, G12, T7
25	75	30	1500	NP	1500	650	HA-2	G12, T7
26	75	30	NP	800	1500	650	HA-2	G5, G12, T6
27	75	30	1500	NP	NP	NP	HA-2	G12, T7, W13
28	75	30	1500	800	NP	NP	HA-2	G5, G12, T7, W12, W13
29	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T7
30	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T7
31	75	30	1500	800	1500	650	HA-2	G5, G12, T7
32	75	30	1500	NP	1500	650	HA-2	G12, T7
33	75	30	1500	800	1500	650	HA-2	G5, G12, T7, W12, W13, W14
34	75	30	1500	NP	1500	650	HA-2	T7, W13, W14
35	75	30	NP	800	NP	NP	HA-2	G5, H1, W12
36	75	30	1500	NP	NP	NP	HA-2	G5, G12, H1, T7
37	75	30	1500	NP	1500	NP	HA-2	G12, H1, T7
38	75	30	NP	800	1500	NP	HA-2	G5, G12, T6
39	75	30	NP	800	1500	650	HA-2	G5, G12, T6, W12, W14
40	75	30	NP	800	NP	NP	HA-2	G5, W12
41	75	30	1500	NP	NP	NP	HA-2	G5, G12, H1, T7
42	75	30	1500	NP	1500	650	HA-2	G12, G22, H1, T7
43	75	30	NP	800	1500	650	HA-2	G5, G12, G22, H1, T6
44	75	30	NP	800	NP	NP	HA-2	G5, H1, W12
45	75	30	NP	800	NP	NP	HA-2	G5, W12

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	16.7	...	16.7	...	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	13.9	13.8
2	16.7	...	15.0	...	13.8	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.2
3	16.7	16.7	16.7	16.7	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	13.9	13.8
4	16.7	15.6	15.0	14.4	13.8	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.2
5	16.7	16.7	16.7	16.7	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	13.9	13.8
6	16.7	15.6	15.0	14.4	13.8	12.8	11.9	11.3	11.0	10.8	10.6	10.5	10.3	10.2
7	16.7	...	16.7	...	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	13.9	13.8
8	20.0	...	19.0	...	17.8	17.5	17.5	17.5	17.5	17.5	17.2	16.9	16.7	16.5
9	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
10	20.0	...	19.0	...	17.8	17.5	17.5	17.5	17.5	17.5	17.2	16.9	16.7	16.5
11	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
12	20.0	...	19.0	...	17.8	17.5	17.5	17.5	17.5	17.5	17.2	16.9	16.7	16.5
13	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
14	20.0	...	19.0	...	17.8	17.5	17.5	17.5	17.5	17.5	17.2	16.9	16.7	16.5
15	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
16	19.3	...	19.3	...	19.3	19.3	18.7	17.7	17.2	16.9	16.6	16.4	16.2	16.0
17	19.3	...	17.4	...	16.0	14.8	13.8	13.1	12.8	12.5	12.3	12.1	12.0	11.9
18	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
19	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
20	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
21	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
22	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
23	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
24	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
25	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
26	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
27	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
28	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
29	17.0	...	17.0	...	16.2	15.9	15.9	15.5	15.2	14.9	14.6	14.4	14.2	14.1
30	17.0	...	15.3	...	14.1	13.0	12.2	11.5	11.2	11.0	10.8	10.7	10.5	10.4
31	20.0	20.0	20.0	19.6	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
32	20.0	18.7	18.0	17.2	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
33	20.0	20.0	20.0	19.6	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
34	20.0	18.7	18.0	17.2	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
35	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	...	...
36	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
37	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
38	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
39	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
40	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	...	...
41	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
42	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
43	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
44	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	...	...
45	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	13.6	13.5	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
2	10.1	10.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
3	13.6	13.5	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
4	10.1	10.0	9.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
5	13.6	13.5	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
6	10.1	10.0	9.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
7	13.6	13.5	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
8	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
9	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
10	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
11	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
12	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
13	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
14	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
15	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
16	15.8	14.9	9.6	...	...	...	...	...	...	...	...	...	...	...	...
17	11.7	11.6	9.6	...	...	...	...	...	...	...	...	...	...	...	...
18	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
19	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
20	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
21	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
22	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
23	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
24	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
25	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
26	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
27	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
28	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
29	13.9	13.8	8.2	5.9	4.3	3.1	2.2	1.4	0.9	0.68	0.43	0.26	...	...	...
30	10.3	10.2	8.2	5.9	4.3	3.1	2.2	1.4	0.9	0.68	0.43	0.26	...	...	...
31	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
32	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
33	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
34	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
37	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
38	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
39	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
42	12.1	12.0	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
43	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Group P-No.	No.
1	18Cr-10Ni-Ti	Bar	SA/JIS G4303	SUS321	...	...	...	8	1
2	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	≤5	8	1
3	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	≤5	8	1
4	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321H	S32109	...	...	8	1
5	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321H	S32109	...	...	8	1
6	18Cr-10Ni-Ti	Plate	SA-240	321H	S32109	...	...	8	1
7	18Cr-10Ni-Ti	Plate	SA-240	321H	S32109	...	...	8	1
8	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
9	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
10	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
11	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
12	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	≤ ³ / ₁₆	8	1
13	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	≤ ³ / ₁₆	8	1
14	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	≤ ³ / ₁₆	8	1
15	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	≤ ³ / ₁₆	8	1
16	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	≤ ³ / ₈	8	1
17	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	≤ ³ / ₈	8	1
18	18Cr-10Ni-Ti	Smls. & wld. fittings	SA-403	321H	S32109	...	...	8	1
19	18Cr-10Ni-Ti	Bar	SA-479	321H	S32109	...	...	8	1
20	18Cr-10Ni-Ti	Bar	SA-479	321H	S32109	...	...	8	1
21	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321H	S32109	...	...	8	1
22	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321H	S32109	...	...	8	1
23	18Cr-11Ni	Plate	SA-240	305	S30500	...	...	8	1
(23)	18Cr-12Ni-2Mo	Castings	SA-351	CF3M	J92800	...	...	8	1
(23)	18Cr-12Ni-2Mo	Castings	SA-351	CF3M	J92800	...	...	8	1
(23)	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF3M	J92800	...	...	8	1
(23)	18Cr-12Ni-2Mo	Castings	SA-351	CF8M	J92900	...	...	8	1
(23)	18Cr-12Ni-2Mo	Castings	SA-351	CF8M	J92900	...	...	8	1
(23)	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF8M	J92900	...	...	8	1
30	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...	>5	8	1
31	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...	>5	8	1
32	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...	≤5	8	1
33	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...	≤5	8	1
34	18Cr-13Ni-3Mo	Forgings	SA-182	F317	S31700	...	≤5	8	1
35	18Cr-13Ni-3Mo	Forgings	SA-182	F317	S31700	...	≤5	8	1
36	18Cr-13Ni-3Mo	Plate	SA-240	317	S31700	...	...	8	1
37	18Cr-13Ni-3Mo	Plate	SA-240	317	S31700	...	...	8	1
38	18Cr-13Ni-3Mo	Plate	SA-240	317L	S31703	...	...	8	1
39	18Cr-13Ni-3Mo	Plate	SA-240	317L	S31703	...	...	8	1
40	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	8	1
41	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	8	1
42	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	8	1
43	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317L	S31703	...	...	8	1
44	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317L	S31703	...	...	8	1
45	18Cr-13Ni-3Mo	Smls. & wld. pipe	SA-312	TP317	S31700	...	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	NP	800	1500	NP	HA-2	G5, G12, G22, H1, T6
2	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
3	75	30	1500	NP	1500	NP	HA-2	H2, T8
4	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
5	75	30	1500	NP	1500	NP	HA-2	H2, T8
6	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
7	75	30	1500	NP	1500	NP	HA-2	H2, T8
8	75	30	1500	NP	NP	NP	HA-2	T8, W13
9	75	30	1500	800	NP	NP	HA-2	G5, T8, W12, W13
10	75	30	1500	NP	1500	NP	HA-2	G5, G5, G24, T8
11	75	30	1500	NP	1500	NP	HA-2	G5, G24, T8
12	75	30	1500	800	1500	NP	HA-2	G5, T8
13	75	30	1500	NP	1500	NP	HA-2	T8
14	75	30	1500	800	1500	NP	HA-2	G5, T8, W12, W13, W14
15	75	30	1500	NP	1500	NP	HA-2	T8, W13, W14
16	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
17	75	30	1500	NP	1500	NP	HA-2	H2, T8
18	75	30	NP	800	1500	NP	HA-2	G5, H2, T8, W12, W14
19	75	30	1500	NP	1500	NP	HA-2	H2, T8
20	75	30	1500	800	1500	NP	HA-2	G5, H2, T8
21	75	30	NP	800	NP	NP	HA-2	G5, H2, W12
22	75	30	NP	800	NP	NP	HA-2	G5, W12
23	75	30	NP	800	NP	NP	HA-1	G5
24	70	30	NP	800	850	650	HA-4	G1, G5, G16, G17, G19
25	70	30	NP	NP	850	650	HA-4	G1, G19
26	70	30	NP	800	800	NP	HA-4	G1, G5, G16, G17, G19
27	70	30	1500	800	1500	650	HA-2	G1, G5, G12, G16, G17, G19, H1, T6
28	70	30	1500	NP	1500	650	HA-2	G1, G12, G19, H1, T8
29	70	30	NP	800	800	NP	HA-2	G1, G5, G16, G17, G19
30	65	25	NP	NP	850	650	HA-4	G5
31	65	25	NP	NP	850	650	HA-4	...
32	70	25	NP	NP	850	650	HA-4	G5
33	70	25	NP	NP	850	650	HA-4	...
34	75	30	NP	NP	1500	650	HA-2	G5, G12, T8
35	75	30	NP	NP	1500	650	HA-2	G12, T9
36	75	30	NP	NP	1500	650	HA-2	G5, G12, T8
37	75	30	NP	NP	1500	650	HA-2	G12, T9
38	75	30	NP	NP	850	650	HA-4	G5
39	75	30	NP	NP	850	650	HA-4	...
40	75	30	NP	800	NP	NP	HA-2	G5, W12
41	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T8
42	75	30	NP	NP	1500	650	HA-2	G12, G24, T9
43	75	30	NP	NP	850	650	HA-4	G5, G24
44	75	30	NP	NP	850	650	HA-4	G24
45	75	30	NP	800	1500	650	HA-2	G5, G12, T8, W12, W14

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
2	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
3	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
4	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
5	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
6	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
7	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
8	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
9	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
10	17.0	...	17.0	...	16.2	15.9	15.9	15.5	15.2	14.9	14.6	14.4	14.2	14.1
11	17.0	...	15.3	...	14.1	13.0	12.2	11.5	11.2	11.0	10.8	10.7	10.5	10.4
12	20.0	20.0	20.0	19.6	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
13	20.0	18.7	18.0	17.2	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
14	20.0	20.0	20.0	19.6	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
15	20.0	18.7	18.0	17.2	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
16	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
17	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
18	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
19	20.0	...	18.0	...	16.5	15.3	14.3	13.5	13.2	13.0	12.7	12.6	12.4	12.3
20	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	16.7	16.5
21	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	...	...
22	20.0	...	20.0	...	19.1	18.7	18.7	18.3	17.9	17.5	17.2	16.9	...	...
23	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
24	20.0	...	20.0	...	19.4	19.2	17.9	17.0	16.6	16.3	16.0	15.8	15.7	...
25	20.0	...	17.2	...	15.5	14.2	13.3	12.6	12.3	12.1	11.9	11.7	11.6	...
26	20.0	...	20.0	...	19.4	19.2	17.9	17.0	16.6	16.3	16.1	15.8	...	...
27	20.0	...	20.0	...	19.4	19.2	17.9	17.0	16.6	16.3	16.0	15.8	15.7	15.5
28	20.0	...	17.2	...	15.5	14.2	13.3	12.6	12.3	12.1	11.9	11.7	11.6	11.5
29	20.0	...	20.0	...	19.4	19.2	17.9	17.0	16.6	16.3	16.0	15.8	...	...
30	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	...
31	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	...
32	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	12.7	...
33	16.7	...	14.2	...	12.7	11.7	10.9	10.4	10.2	10.0	9.8	9.6	9.4	...
34	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
35	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
36	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
37	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
38	20.0	...	20.0	...	19.6	18.9	17.7	16.9	16.5	16.2	15.8	15.5	15.2	...
39	20.0	...	17.0	...	15.2	14.0	13.1	12.5	12.2	12.0	11.7	11.5	11.3	...
40	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
41	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
42	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
43	17.0	...	17.0	...	16.7	16.0	15.1	14.3	14.0	13.7	13.5	13.2	12.9	...
44	17.0	...	14.5	...	12.9	11.9	11.2	10.6	10.4	10.2	10.0	9.8	9.6	...
45	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	16.4	14.9	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30	...	...	...
2	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
3	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
4	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
5	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
6	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
7	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
8	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
9	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
10	13.9	13.8	10.5	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94	...	...	...
11	10.3	10.2	10.1	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94	...	...	...
12	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
13	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
14	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
15	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
16	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
17	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
18	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
19	12.1	12.0	11.9	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
20	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	15.4	14.9	11.5	8.9	6.9	5.4	4.3	3.4	2.8	2.3	1.9	1.6	...	...	(23)
28	11.4	11.3	11.2	8.9	6.9	5.4	4.3	3.4	2.8	2.3	1.9	1.6	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
35	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
36	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
37	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.5	1.1	...	...	...
42	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.5	1.1	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-13Ni-3Mo	Smls. pipe	SA-312	TP317	S31700	...	...	8	1
2	18Cr-13Ni-3Mo	Wld. pipe	SA-312	TP317	S31700	...	...	8	1
3	18Cr-13Ni-3Mo	Wld. pipe	SA-312	TP317	S31700	...	...	8	1
4	18Cr-13Ni-3Mo	Smls. pipe	SA-312	TP317L	S31703	...	...	8	1
5	18Cr-13Ni-3Mo	Smls. pipe	SA-312	TP317L	S31703	...	...	8	1
6	18Cr-13Ni-3Mo	Wld. pipe	SA-312	TP317L	S31703	...	...	8	1
7	18Cr-13Ni-3Mo	Wld. pipe	SA-312	TP317L	S31703	...	...	8	1
8	18Cr-13Ni-3Mo	Smls. & wld. fittings	SA-403	317	S31700	...	...	8	1
9	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	CR	...	8	1
10	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	CR	...	8	1
11	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-S	...	8	1
12	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-S	...	8	1
13	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-W	...	8	1
14	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-W	...	8	1
15	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-WU	...	8	1
16	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-WU	...	8	1
17	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-WX	...	8	1
18	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-WX	...	8	1
19	18Cr-15Ni-4Si	Forgings	SA-182	...	S30600	Sol. ann.	...	8	1
20	18Cr-15Ni-4Si	Forgings	SA-182	...	S30600	Sol. ann.	...	8	1
21	18Cr-15Ni-4Si	Plate	SA-240	...	S30600	Sol. ann.	≤2	8	1
22	18Cr-15Ni-4Si	Plate	SA-240	...	S30600	Sol. ann.	≤2	8	1
23	18Cr-15Ni-4Si	Smls. & wld. pipe	SA-312	...	S30600	Sol. ann.	...	8	1
24	18Cr-15Ni-4Si	Smls. & wld. pipe	SA-312	...	S30600	Sol. ann.	...	8	1
25	18Cr-15Ni-4Si	Wld. pipe	SA-312	...	S30600	Sol. ann.	...	8	1
26	18Cr-15Ni-4Si	Wld. pipe	SA-312	...	S30600	Sol. ann.	...	8	1
27	18Cr-15Ni-4Si	Bar	SA-479	...	S30600	Sol. ann.	≤4	8	1
28	18Cr-15Ni-4Si	Bar	SA-479	...	S30600	Sol. ann.	≤4	8	1
29	18Cr-18Ni-2Si	Smls. tube	SA-213	XM-15	S38100	...	...	8	1
30	18Cr-18Ni-2Si	Smls. tube	SA-213	XM-15	S38100	...	...	8	1
31	18Cr-18Ni-2Si	Plate	SA-240	XM-15	S38100	...	...	8	1
32	18Cr-18Ni-2Si	Plate	SA-240	XM-15	S38100	...	...	8	1
33	18Cr-18Ni-2Si	Wld. tube	SA-249	TPXM-15	S38100	...	...	8	1
34	18Cr-18Ni-2Si	Wld. tube	SA-249	TPXM-15	S38100	...	...	8	1
35	18Cr-18Ni-2Si	Wld. pipe	SA-312	TPXM-15	S38100	...	...	8	1
36	18Cr-18Ni-2Si	Wld. pipe	SA-312	TPXM-15	S38100	...	...	8	1
37	18Cr-20Ni-5.5Si	Smls. tube	SA-213	...	S32615	Sol. ann.	...	8	1
38	18Cr-20Ni-5.5Si	Smls. tube	SA-213	...	S32615	Sol. ann.	...	8	1
39	18Cr-20Ni-5.5Si	Plate	SA-240	...	S32615	Sol. ann.	...	8	1
40	18Cr-20Ni-5.5Si	Plate	SA-240	...	S32615	Sol. ann.	...	8	1
41	18Cr-20Ni-5.5Si	Smls. & wld. pipe	SA-312	...	S32615	Sol. ann.	...	8	1
42	18Cr-20Ni-5.5Si	Smls. & wld. pipe	SA-312	...	S32615	Sol. ann.	...	8	1
43	18Cr-20Ni-5.5Si	Wld. pipe	SA-312	...	S32615	Sol. ann.	...	8	1
44	18Cr-20Ni-5.5Si	Wld. pipe	SA-312	...	S32615	Sol. ann.	...	8	1
45	18Cr-20Ni-5.5Si	Bar	SA-479	...	S32615	Sol. ann.	...	8	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	NP	NP	1500	650	HA-2	G12, T9
2	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T8
3	75	30	NP	NP	1500	650	HA-2	G12, G24, T9
4	75	30	NP	NP	850	650	HA-4	G5
5	75	30	NP	NP	850	650	HA-4	...
6	75	30	NP	NP	850	650	HA-4	G5, G24
7	75	30	NP	NP	850	650	HA-4	G24
8	75	30	NP	NP	1500	650	HA-2	G5, G12, T8, W14
9	75	30	NP	NP	850	650	HA-4	G5, G24
10	75	30	NP	NP	850	650	HA-4	G24
11	75	30	NP	NP	850	650	HA-4	G5
12	75	30	NP	NP	850	650	HA-4	...
13	75	30	NP	NP	850	650	HA-4	G5, G24
14	75	30	NP	NP	850	650	HA-4	G24
15	75	30	NP	NP	850	650	HA-4	G5, G24
16	75	30	NP	NP	850	650	HA-4	G24
17	75	30	NP	NP	850	650	HA-4	G5, G24
18	75	30	NP	NP	850	650	HA-4	G24
19	78	35	NP	NP	300	NP	HA-2	G5, H6
20	78	35	NP	NP	300	NP	HA-2	H6
21	78	35	NP	NP	300	NP	HA-2	G5, H6
22	78	35	NP	NP	300	NP	HA-2	H6
23	78	35	NP	NP	300	NP	HA-2	G5, H6
24	78	35	NP	NP	300	NP	HA-2	H6
25	78	35	NP	NP	300	NP	HA-2	G5, G24, H6
26	78	35	NP	NP	300	NP	HA-2	G24, H6
27	78	35	NP	NP	300	NP	HA-2	G5, H6
28	78	35	NP	NP	300	NP	HA-2	H6
29	75	30	NP	NP	1000	650	HA-2	G5
30	75	30	NP	NP	1000	650	HA-2	...
31	75	30	NP	NP	1000	650	HA-2	G5
32	75	30	NP	NP	1000	650	HA-2	...
33	75	30	NP	NP	1000	650	HA-2	G5, G24
34	75	30	NP	NP	1000	650	HA-2	G24
35	75	30	NP	NP	950	650	HA-2	G5, G24
36	75	30	NP	NP	1000	650	HA-2	G24
37	80	32	NP	NP	400	NP	HA-2	G5, H6
38	80	32	NP	NP	400	NP	HA-2	H6
39	80	32	NP	NP	400	NP	HA-2	G5, H6
40	80	32	NP	NP	400	NP	HA-2	H6
41	80	32	NP	NP	400	NP	HA-2	G5, H6
42	80	32	NP	NP	400	NP	HA-2	H6
43	80	32	NP	NP	400	NP	HA-2	G5, G24, H6
44	80	32	NP	NP	400	NP	HA-2	G24, H6
45	80	32	NP	NP	400	NP	HA-2	G5, H6

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	17.3	...	15.6	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
2	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	13.4	13.2
3	17.0	...	14.7	...	13.2	12.1	11.3	10.7	10.5	10.3	10.1	10.0	9.9	9.8
4	20.0	20.0	20.0	20.0	19.6	18.9	17.7	16.9	16.5	16.2	15.8	15.5	15.2	...
5	20.0	18.2	17.0	16.0	15.2	14.0	13.1	12.5	12.2	12.0	11.7	11.5	11.3	...
6	17.0	17.0	17.0	17.0	16.7	16.0	15.1	14.3	14.0	13.7	13.5	13.2	12.9	...
7	17.0	15.5	14.5	13.6	12.9	11.9	11.2	10.6	10.4	10.2	10.0	9.8	9.6	...
8	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	15.7	15.6
9	17.0	...	17.0	...	16.7	16.0	15.1	14.3	14.0	13.7	13.5	13.2	12.9	...
10	17.0	...	14.5	...	12.9	11.9	11.2	10.6	10.4	10.2	10.0	9.8	9.6	...
11	20.0	...	20.0	...	19.6	18.9	17.7	16.9	16.5	16.2	15.8	15.5	15.2	...
12	20.0	...	17.0	...	15.2	14.0	13.1	12.5	12.2	12.0	11.7	11.5	11.3	...
13	17.0	...	17.0	...	16.7	16.0	15.1	14.3	14.0	13.7	13.5	13.2	12.9	...
14	17.0	...	14.5	...	12.9	11.9	11.2	10.6	10.4	10.2	10.0	9.8	9.6	...
15	17.0	...	17.0	...	16.7	16.0	15.1	14.3	14.0	13.7	13.5	13.2	12.9	...
16	17.0	...	14.5	...	12.9	11.9	11.2	10.6	10.4	10.2	10.0	9.8	9.6	...
17	17.0	...	17.0	...	16.7	16.0	15.1	14.3	14.0	13.7	13.5	13.2	12.9	...
18	17.0	...	14.5	...	12.9	11.9	11.2	10.6	10.4	10.2	10.0	9.8	9.6	...
19	22.3	...	21.3	...	19.6	...	...	...	...	...	...	...	...	...
20	22.3	...	17.9	...	16.1	...	...	...	...	...	...	...	...	...
21	22.3	...	21.3	...	19.6	...	...	...	...	...	...	...	...	...
22	22.3	...	17.9	...	16.1	...	...	...	...	...	...	...	...	...
23	22.3	...	21.3	...	19.6	...	...	...	...	...	...	...	...	...
24	22.3	...	17.9	...	16.1	...	...	...	...	...	...	...	...	...
25	19.0	...	18.1	...	16.7	...	...	...	...	...	...	...	...	...
26	19.0	...	15.2	...	13.7	...	...	...	...	...	...	...	...	...
27	22.3	...	21.3	...	19.6	...	...	...	...	...	...	...	...	...
28	22.3	...	17.9	...	16.1	...	...	...	...	...	...	...	...	...
29	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
30	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
31	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	14.9	14.6
32	20.0	...	16.7	...	15.0	13.8	12.9	12.3	12.0	11.7	11.5	11.2	11.0	10.8
33	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
34	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
35	17.0	...	17.0	...	16.1	15.5	14.8	14.1	13.8	13.5	13.2	12.9	12.6	12.4
36	17.0	...	14.2	...	12.7	11.7	11.0	10.4	10.2	10.0	9.8	9.6	9.4	9.2
37	21.3	...	21.3	...	21.3	21.0	...	...	...	...	...	...	...	...
38	21.3	...	17.6	...	16.5	15.4	...	...	...	...	...	...	...	...
39	21.3	...	21.3	...	21.3	21.0	...	...	...	...	...	...	...	...
40	21.3	...	17.6	...	16.5	15.4	...	...	...	...	...	...	...	...
41	21.3	...	21.3	...	21.3	21.0	...	...	...	...	...	...	...	...
42	21.3	...	17.6	...	16.5	15.4	...	...	...	...	...	...	...	...
43	18.1	...	18.1	...	18.1	17.9	...	...	...	...	...	...	...	...
44	18.1	...	15.0	...	14.0	13.1	...	...	...	...	...	...	...	...
45	21.3	...	21.3	...	21.3	21.0	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	11.4	11.3	11.2	11.1	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
2	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.5	1.1	...	...	...
3	9.7	9.6	9.5	9.4	8.3	6.3	4.7	3.5	2.6	1.9	1.5	1.1	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	14.3	14.0	...	...	...	...	...	...	...	...	...	...	...	...	...
30	10.6	10.4	...	...	...	...	...	...	...	...	...	...	...	...	...
31	14.3	14.0	...	...	...	...	...	...	...	...	...	...	...	...	...
32	10.6	10.4	...	...	...	...	...	...	...	...	...	...	...	...	...
33	12.1	11.9	...	...	...	...	...	...	...	...	...	...	...	...	...
34	9.0	8.8	...	...	...	...	...	...	...	...	...	...	...	...	...
35	12.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	9.0	8.8	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-20Ni-5.5Si	Bar	SA-479	...	S32615	Sol. ann.	...	8	1
2	19Cr-9Ni- $\frac{1}{2}$ Mo	Castings	SA-351	CF10	J92590	...	...	8	1
3	19Cr-9Ni- $\frac{1}{2}$ Mo	Castings	SA-351	CF10	J92590	...	...	8	1
4	19Cr-9Ni-2Mo	Castings	SA-351	CF10M	...	...	...	8	1
5	19Cr-9Ni-2Mo	Castings	SA-351	CF10M	...	...	...	8	1
6	19Cr-10Ni-3Mo	Castings	SA-351	CG8M	J93000	...	...	8	1
7	19Cr-10Ni-3Mo	Castings	SA-351	CG8M	J93000	...	...	8	1
8	19Cr-15Ni-4Mo	Smls. tube	SA-213	...	S31725	...	...	8	4
9	19Cr-15Ni-4Mo	Smls. tube	SA-213	...	S31725	...	...	8	4
10	19Cr-15Ni-4Mo	Plate	SA-240	...	S31725	...	...	8	4
11	19Cr-15Ni-4Mo	Plate	SA-240	...	S31725	...	...	8	4
12	19Cr-15Ni-4Mo	Wld. tube	SA-249	...	S31725	...	...	8	4
13	19Cr-15Ni-4Mo	Wld. tube	SA-249	...	S31725	...	...	8	4
14	19Cr-15Ni-4Mo	Smls. pipe	SA-312	...	S31725	...	...	8	4
15	19Cr-15Ni-4Mo	Smls. pipe	SA-312	...	S31725	...	...	8	4
16	19Cr-15Ni-4Mo	Wld. pipe	SA-312	...	S31725	...	...	8	4
17	19Cr-15Ni-4Mo	Wld. pipe	SA-312	...	S31725	...	...	8	4
18	19Cr-15Ni-4Mo	Wld. pipe	SA-358	...	S31725	...	...	8	4
19	19Cr-15Ni-4Mo	Wld. pipe	SA-358	...	S31725	...	...	8	4
20	19Cr-15Ni-4Mo	Smls. pipe	SA-376	...	S31725	...	...	8	4
21	19Cr-15Ni-4Mo	Smls. pipe	SA-376	...	S31725	...	...	8	4
22	19Cr-15Ni-4Mo	Fittings	SA-403	...	S31725	...	...	8	4
23	19Cr-15Ni-4Mo	Wld. pipe	SA-409	...	S31725	...	...	8	4
24	19Cr-15Ni-4Mo	Wld. pipe	SA-409	...	S31725	...	...	8	4
25	19Cr-15Ni-4Mo	Bar	SA-479	...	S31725	...	...	8	4
26	19Cr-15Ni-4Mo	Bar	SA-479	...	S31725	...	...	8	4
27	20Cr-3Ni-1.5Mo-N	Plate	SA-240	...	S32003	...	$t > \frac{3}{16}$	10H	1
28	20Cr-3Ni-1.5Mo-N	Wld. pipe	SA-790	...	S32003	...	...	10H	1
29	20Cr-3Ni-1.5Mo-N	Sheet	SA-240	...	S32003	...	$t \leq \frac{3}{16}$	10H	1
30	20Cr-3Ni-1.5Mo-N	Smls. tube	SA-789	...	S32003	...	$t \leq \frac{3}{16}$	10H	1
(23) 31	20Cr-3Ni-1.5Mo-N	Wld. tube	SA-789	...	S32003	...	$t \leq \frac{3}{16}$	10H	1
32	20Cr-3Ni-1.5Mo-N	Smls. tube	SA-789	...	S32003	...	$t > \frac{3}{16}$	10H	1
33	20Cr-3Ni-1.5Mo-N	Wld. tube	SA-789	...	S32003	...	$t > \frac{3}{16}$	10H	1
34	20Cr-10Ni	Bar	SA-479	ER308	S30880	...	...	...	...
35	20Cr-18Ni-6Mo	Castings	SA-351	CK3MCuN	J93254	...	...	8	4
36	20Cr-18Ni-6Mo	Castings	SA-351	CK3MCuN	J93254	...	...	8	4
37	20Cr-18Ni-6Mo	Forgings	SA-182	F44	S31254	...	...	8	4
38	20Cr-18Ni-6Mo	Forgings	SA-182	F44	S31254	...	...	8	4
39	20Cr-18Ni-6Mo	Fittings	SA-403	...	S31254	...	...	8	4
40	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...	$t > 0.187$	8	4
41	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...	$t > 0.187$	8	4
42	20Cr-18Ni-6Mo	Plate	SA-240	...	S31254	...	$> \frac{3}{16}$	8	4
43	20Cr-18Ni-6Mo	Plate	SA-240	...	S31254	...	$> \frac{3}{16}$	8	4
44	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...	$t > 0.187$	8	4
45	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...	$t > 0.187$	8	4

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	80	32	NP	NP	400	NP	HA-2	H6
2	70	30	NP	NP	1500	650	HA-1	G1, G5, G19, T6
3	70	30	NP	NP	1500	650	HA-1	G1, G19, T7
4	70	30	NP	NP	1500	NP	HA-2	G1, G5, G19, T6
5	70	30	NP	NP	1500	NP	HA-2	G1, G19, T8
6	75	35	NP	NP	1000	650	HA-2	G1, G5, G19
7	75	35	NP	NP	1000	650	HA-2	G1, G19
8	75	30	NP	NP	400	400	HA-4	G5
9	75	30	NP	NP	400	400	HA-4	...
10	75	30	NP	NP	400	400	HA-4	G5
11	75	30	NP	NP	400	400	HA-4	...
12	75	30	NP	NP	400	400	HA-4	G5, G24
13	75	30	NP	NP	400	400	HA-4	G24
14	75	30	NP	NP	400	NP	HA-4	G5
15	75	30	NP	NP	400	NP	HA-4	...
16	75	30	NP	NP	400	NP	HA-4	G5, G24
17	75	30	NP	NP	400	NP	HA-4	G24
18	75	30	NP	NP	400	400	HA-4	G5, G24
19	75	30	NP	NP	400	400	HA-4	G24
20	75	30	NP	NP	400	400	HA-4	G5
21	75	30	NP	NP	400	400	HA-4	...
22	75	30	NP	NP	400	400	HA-4	G5, W14
23	75	30	NP	NP	400	400	HA-4	G5, G24
24	75	30	NP	NP	400	400	HA-4	G24
25	75	30	NP	NP	400	400	HA-4	G5
26	75	30	NP	NP	400	400	HA-4	...
27	95	65	NP	NP	650	NP	HA-5	G19
28	95	65	NP	NP	650	NP	HA-5	G19, G24
29	100	70	NP	NP	650	NP	HA-5	G19
30	100	70	NP	NP	650	NP	HA-5	G19
31	100	70	NP	NP	650	NP	HA-5	G19, G24
32	95	65	NP	NP	650	NP	HA-5	G19
33	95	65	NP	NP	650	NP	HA-5	G19, G24
34	75	30	NP	800	NP	NP	HA-2	G5
35	80	38	NP	750	750	650	HA-2	G1, G5
36	80	38	NP	NP	750	650	HA-2	G1
37	94	44	NP	750	750	650	HA-2	G5
38	94	44	NP	NP	750	650	HA-2	...
39	94	44	NP	750	NP	NP	HA-2	G5, W12
40	95	45	NP	NP	750	NP	HA-2	G5
41	95	45	NP	NP	750	NP	HA-2	...
42	95	45	NP	750	750	650	HA-2	G5
43	95	45	NP	NP	750	650	HA-2	...
44	95	45	NP	750	750	650	HA-2	G5, G24
45	95	45	NP	NP	750	650	HA-2	G24

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	21.3	...	17.6	...	16.5	15.4	...	...	...	...	...	...	...	...
2	20.0	...	19.0	...	17.7	17.2	17.0	16.5	16.2	15.8	15.5	15.2	14.9	14.6
3	20.0	...	16.7	...	15.0	13.8	12.9	12.2	12.0	11.7	11.5	11.3	11.1	10.8
4	20.0	...	20.0	...	19.5	19.3	17.9	17.0	16.6	16.3	16.1	15.9	15.7	15.5
5	20.0	...	17.5	...	15.7	14.3	13.3	12.6	12.3	12.1	11.9	11.8	11.6	11.5
6	21.4	...	20.8	...	19.6	19.1	18.4	17.5	17.1	16.8	16.6	16.4	16.2	16.0
7	21.4	...	18.8	...	16.4	14.7	13.6	12.9	12.7	12.5	12.3	12.1	12.0	11.8
8	20.0	...	20.0	...	19.6	18.9	...	...	...	...	...	...	...	...
9	20.0	...	16.9	...	15.2	14.0	...	...	...	...	...	...	...	...
10	20.0	...	20.0	...	19.6	18.9	...	...	...	...	...	...	...	...
11	20.0	...	16.9	...	15.2	14.0	...	...	...	...	...	...	...	...
12	17.0	...	17.0	...	16.6	16.1	...	...	...	...	...	...	...	...
13	17.0	...	14.4	...	12.9	11.9	...	...	...	...	...	...	...	...
14	20.0	...	20.0	...	19.6	18.9	...	...	...	...	...	...	...	...
15	20.0	...	16.9	...	15.2	14.0	...	...	...	...	...	...	...	...
16	17.0	...	17.0	...	16.6	16.1	...	...	...	...	...	...	...	...
17	17.0	...	14.4	...	12.9	11.9	...	...	...	...	...	...	...	...
18	17.0	...	17.0	...	16.6	16.1	...	...	...	...	...	...	...	...
19	17.0	...	14.4	...	12.9	11.9	...	...	...	...	...	...	...	...
20	20.0	...	20.0	...	19.6	18.9	...	...	...	...	...	...	...	...
21	20.0	...	16.9	...	15.2	14.0	...	...	...	...	...	...	...	...
22	20.0	...	20.0	...	19.6	18.9	...	...	...	...	...	...	...	...
23	17.0	...	17.0	...	16.6	16.1	...	...	...	...	...	...	...	...
24	17.0	...	14.4	...	12.9	11.9	...	...	...	...	...	...	...	...
25	20.0	...	20.0	...	19.6	18.9	...	...	...	...	...	...	...	...
26	20.0	...	16.9	...	15.2	14.0	...	...	...	...	...	...	...	...
27	27.1	...	26.3	...	24.8	24.5	24.5	24.5	24.5	...	...	...	...	...
28	23.1	...	22.4	...	21.0	20.8	20.8	20.8	20.8	...	...	...	...	...
29	28.6	...	27.7	...	26.1	25.8	25.8	25.8	25.8	...	...	...	...	...
30	28.6	...	27.7	...	26.1	25.8	25.8	25.8	25.8	...	...	...	...	...
31	24.3	...	23.5	...	22.1	21.9	21.9	21.9	21.9	...	...	...	...	...
32	27.1	...	26.3	...	24.8	24.5	24.5	24.5	24.5	...	...	...	...	...
33	23.1	...	22.4	...	21.0	20.8	20.8	20.8	20.8	...	...	...	...	...
34	20.0	...	20.0	...	18.9	18.3	17.5	16.6	16.2	15.8	15.5	15.2	...	...
35	22.9	...	22.9	...	21.7	20.7	20.0	19.6	19.4	19.3	19.2	...	...	...
36	22.9	...	20.7	...	18.5	17.1	16.1	15.4	15.2	15.1	15.0	...	...	...
37	26.9	...	26.9	...	25.5	24.3	23.5	23.0	22.8	22.7	22.6	...	...	...
38	26.9	...	23.9	...	21.4	19.8	18.6	17.9	17.6	17.4	17.3	...	...	...
39	26.9	...	26.9	...	25.5	24.3	23.5	23.0	22.8	22.7	22.6	...	...	...
40	27.1	...	27.1	...	25.8	24.6	23.7	23.2	23.1	23.0	22.9	...	...	...
41	27.1	...	24.5	...	21.9	20.3	19.1	18.3	18.0	17.9	17.7	...	...	...
42	27.1	...	27.1	...	25.8	24.6	23.7	23.2	23.1	23.0	22.9	...	...	...
43	27.1	...	24.5	...	21.9	20.2	19.1	18.3	18.0	17.8	17.7	...	...	...
44	23.1	...	23.1	...	21.9	20.9	20.2	19.7	19.6	19.5	19.4	...	...	...
45	23.1	...	20.8	...	18.6	17.2	16.2	15.5	15.3	15.2	15.1	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	14.4	12.2	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7	...	...	...
3	10.6	10.4	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7	...	...	...
4	15.3	14.9	11.5	8.9	6.9	5.4	4.3	3.4	2.8	2.3	1.9	1.6	...	...	...
5	11.4	11.3	11.2	8.9	6.9	5.4	4.3	3.4	2.8	2.3	1.9	1.6	...	...	...
6	15.7	12.2	...	...	...	...	...	...	...	...	...	...	...	...	...
7	11.6	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	20Cr-18Ni-6Mo	Smls. pipe	SA-312	...	S31254	...	$t > 0.187$	8	4
2	20Cr-18Ni-6Mo	Smls. pipe	SA-312	...	S31254	...	$t > 0.187$	8	4
3	20Cr-18Ni-6Mo	Wld. pipe	SA-312	...	S31254	...	$t > 0.187$	8	4
4	20Cr-18Ni-6Mo	Wld. pipe	SA-312	...	S31254	...	$t > 0.187$	8	4
5	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...	$t \geq 0.187$	8	4
6	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...	$t \geq 0.187$	8	4
7	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...	$t \leq 0.187$	8	4
8	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...	$t \leq 0.187$	8	4
9	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...	$t \leq 0.187$	8	4
10	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...	$t \leq 0.187$	8	4
11	20Cr-18Ni-6Mo	Smls. pipe	SA-312	...	S31254	...	$t \leq 0.187$	8	4
12	20Cr-18Ni-6Mo	Smls. pipe	SA-312	...	S31254	...	$t \leq 0.187$	8	4
13	20Cr-18Ni-6Mo	Wld. pipe	SA-312	...	S31254	...	$t \leq 0.187$	8	4
14	20Cr-18Ni-6Mo	Wld. pipe	SA-312	...	S31254	...	$t \leq 0.187$	8	4
15	20Cr-18Ni-6Mo	Plate	SA-240	...	S31254	...	$\leq \frac{3}{16}$	8	4
16	20Cr-18Ni-6Mo	Plate	SA-240	...	S31254	...	$\leq \frac{3}{16}$	8	4
17	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...	$t < 0.187$	8	4
18	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...	$t < 0.187$	8	4
(23) 19	20.5Cr-8.8Ni-Mo-N	Plate	SA-240	...	S31655	...	...	8	3
(23) 20	20.5Cr-8.8Ni-Mo-N	Plate	SA-240	...	S31655	...	...	8	3
21	21Cr-5Mn-1.5Ni-Cu-N	Plate	SA-240	...	S32101	...	$> \frac{3}{16}$	10H	1
22	21Cr-5Mn-1.5Ni-Cu-N	Bar	SA-479	...	S32101	...	...	10H	1
23	21Cr-5Mn-1.5Ni-Cu-N	Smls. tube	SA-789	...	S32101	...	$> \frac{3}{16}$	10H	1
24	21Cr-5Mn-1.5Ni-Cu-N	Wld. tube	SA-789	...	S32101	...	$> \frac{3}{16}$	10H	1
25	21Cr-5Mn-1.5Ni-Cu-N	Smls. pipe	SA-790	...	S32101	...	$> \frac{3}{16}$	10H	1
26	21Cr-5Mn-1.5Ni-Cu-N	Wld. pipe	SA-790	...	S32101	...	$> \frac{3}{16}$	10H	1
27	21Cr-5Mn-1.5Ni-Cu-N	Fittings	SA-815	...	S32101	...	...	10H	1
28	21Cr-5Mn-1.5Ni-Cu-N	Sheet, strip	SA-240	...	S32101	...	$\leq \frac{3}{16}$	10H	1
29	21Cr-5Mn-1.5Ni-Cu-N	Smls. tube	SA-789	...	S32101	...	$\leq \frac{3}{16}$	10H	1
30	21Cr-5Mn-1.5Ni-Cu-N	Wld. tube	SA-789	...	S32101	...	$\leq \frac{3}{16}$	10H	1
31	21Cr-5Mn-1.5Ni-Cu-N	Smls. pipe	SA-790	...	S32101	...	$\leq \frac{3}{16}$	10H	1
32	21Cr-5Mn-1.5Ni-Cu-N	Wld. pipe	SA-790	...	S32101	...	$\leq \frac{3}{16}$	10H	1
33	21Cr-6Ni-9Mn	Forgings	SA-182	FXM-11	S21904	...	...	8	3
34	21Cr-6Ni-9Mn	Smls. pipe	SA-312	TPXM-11	S21904	...	...	8	3
35	21Cr-6Ni-9Mn	Smls. pipe	SA-312	TPXM-11	S21904	...	...	8	3
36	21Cr-6Ni-9Mn	Wld. pipe	SA-312	TPXM-11	S21904	...	...	8	3
37	21Cr-6Ni-9Mn	Wld. pipe	SA-312	TPXM-11	S21904	...	...	8	3
38	21Cr-6Ni-9Mn	Plate	SA-666	XM-11	S21904	...	...	8	3
39	21Cr-6Ni-9Mn	Plate	SA-666	XM-11	S21904	...	...	8	3
40	21Cr-6Ni-9Mn	Forgings	SA-965	FXM-11	S21904	...	...	8	3
41	21Cr-6Ni-9Mn	Forgings	SA-965	FXM-11	S21904	...	...	8	3
42	21Cr-11Ni-N	Forgings	SA-182	F45	S30815	...	...	8	2
43	21Cr-11Ni-N	Forgings	SA-182	F45	S30815	...	...	8	2
44	21Cr-11Ni-N	Smls. tube	SA-213	...	S30815	...	...	8	2
45	21Cr-11Ni-N	Smls. tube	SA-213	...	S30815	...	...	8	2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	95	45	NP	750	750	NP	HA-2	G5
2	95	45	NP	NP	750	NP	HA-2	...
3	95	45	NP	750	750	NP	HA-2	G5, G24
4	95	45	NP	NP	750	NP	HA-2	G24
5	95	45	NP	750	750	650	HA-2	G5, G24
6	95	45	NP	NP	750	650	HA-2	G24
7	98	45	NP	NP	750	NP	HA-2	G5
8	98	45	NP	NP	750	NP	HA-2	...
9	98	45	NP	750	750	650	HA-2	G5, G24
10	98	45	NP	NP	750	650	HA-2	G24
11	98	45	NP	750	750	NP	HA-2	G5
12	98	45	NP	NP	750	NP	HA-2	...
13	98	45	NP	750	750	NP	HA-2	G5, G24
14	98	45	NP	NP	750	NP	HA-2	G24
15	100	45	NP	750	750	650	HA-2	G5
16	100	45	NP	NP	750	650	HA-2	...
17	100	45	NP	750	750	650	HA-2	G5
18	100	45	NP	NP	750	650	HA-2	...
19	92	45	NP	NP	850	NP	HA-2	G5
20	92	45	NP	NP	850	NP	HA-2	...
21	94	65	NP	NP	600	NP	HA-5	G19
22	94	65	NP	NP	600	NP	HA-5	G19
23	94	65	NP	NP	600	NP	HA-5	G19
24	94	65	NP	NP	600	NP	HA-5	G19, G24
25	94	65	NP	NP	600	NP	HA-5	G19
26	94	65	NP	NP	600	NP	HA-5	G19, G24
27	94	65	NP	NP	600	NP	HA-5	G19, W14
28	101	77	NP	NP	600	NP	HA-5	G19
29	101	77	NP	NP	600	NP	HA-5	G19
30	101	77	NP	NP	600	NP	HA-5	G19, G24
31	101	77	NP	NP	600	NP	HA-5	G19
32	101	77	NP	NP	600	NP	HA-5	G19, G24
33	90	50	NP	NP	600	600	HA-6	...
34	90	50	NP	NP	600	600	HA-6	G5
35	90	50	NP	NP	600	600	HA-6	...
36	90	50	NP	NP	600	600	HA-6	G5, G24
37	90	50	NP	NP	600	600	HA-6	G24
38	90	50	NP	NP	600	600	HA-6	G5
39	90	50	NP	NP	600	600	HA-6	...
40	90	50	NP	NP	600	600	HA-6	G5
41	90	50	NP	NP	600	600	HA-6	...
42	87	45	1650	NP	1650	650	HA-6	G5, G6, T5
43	87	45	1650	NP	1650	650	HA-6	G6, T6
44	87	45	1650	NP	1650	650	HA-6	G5, G6, T5
45	87	45	1650	NP	1650	650	HA-6	G6, T6

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	27.1	...	27.1	...	25.8	24.6	23.7	23.2	23.1	23.0	22.9	...	...	...
2	27.1	...	24.5	...	21.9	20.3	19.1	18.3	18.0	17.9	17.7	...	...	...
3	23.1	...	23.1	...	21.9	20.9	20.2	19.7	19.6	19.5	19.4	...	...	...
4	23.1	...	20.8	...	18.6	17.2	16.2	15.5	15.3	15.2	15.1	...	...	...
5	23.1	...	23.1	...	21.9	20.9	20.2	19.7	19.6	19.5	19.4	...	...	...
6	23.1	...	20.8	...	18.6	17.2	16.2	15.5	15.3	15.2	15.1	...	...	...
7	28.0	...	28.0	...	26.6	25.4	24.5	23.9	23.8	23.7	23.6	...	...	...
8	28.0	...	24.5	...	21.9	20.3	19.1	18.3	18.0	17.9	17.7	...	...	...
9	23.8	...	23.8	...	22.6	21.6	20.8	20.4	20.2	20.1	20.1	...	...	...
10	23.8	...	20.8	...	18.6	17.2	16.2	15.5	15.3	15.2	15.1	...	...	...
11	28.0	...	28.0	...	26.6	25.4	24.5	23.9	23.8	23.7	23.6	...	...	...
12	28.0	...	24.5	...	21.9	20.3	19.1	18.3	18.0	17.9	17.7	...	...	...
13	23.8	...	23.8	...	22.6	21.6	20.8	20.4	20.2	20.1	20.1	...	...	...
14	23.8	...	20.8	...	18.6	17.2	16.2	15.5	15.3	15.2	15.1	...	...	...
15	28.6	...	28.6	...	27.2	25.9	25.0	24.4	24.3	24.1	23.9	...	...	...
16	28.6	...	24.5	...	21.9	20.2	19.1	18.3	18.0	17.8	17.7	...	...	...
17	24.3	...	24.3	...	23.1	22.0	21.3	20.8	20.6	20.5	20.3	...	...	...
18	24.3	...	20.8	...	18.7	17.2	16.2	15.5	15.2	15.2	15.1	...	...	...
19	26.3	...	25.9	...	24.3	23.2	22.5	22.1	21.9	21.7	21.5	21.3	21.0	...
20	26.3	...	23.9	...	21.1	19.3	18.2	17.4	17.1	16.8	16.4	16.1	15.7	...
21	26.9	...	26.9	...	25.6	24.7	24.7	24.7	...	...	...	...	...	...
22	26.9	...	26.9	...	25.6	24.7	24.7	24.7	...	...	...	...	...	...
23	26.9	...	26.9	...	25.6	24.7	24.7	24.7	...	...	...	...	...	...
24	22.8	...	21.1	...	19.8	19.1	19.1	19.1	...	...	...	...	...	...
25	26.9	...	26.9	...	25.6	24.7	24.7	24.7	...	...	...	...	...	...
26	22.8	...	21.1	...	19.8	19.1	19.1	19.1	...	...	...	...	...	...
27	26.9	...	26.9	...	25.6	24.7	24.7	24.7	...	...	...	...	...	...
28	28.9	...	28.9	...	27.5	26.5	26.5	26.5	...	...	...	...	...	...
29	28.9	...	28.9	...	27.5	26.5	26.5	26.5	...	...	...	...	...	...
30	24.5	...	24.5	...	23.4	22.6	22.6	22.6	...	...	...	...	...	...
31	28.9	...	28.9	...	27.5	26.5	26.5	26.5	...	...	...	...	...	...
32	24.5	...	24.5	...	23.4	22.6	22.6	22.6	...	...	...	...	...	...
33	25.7	...	25.7	...	22.0	19.6	18.1	17.1	...	...	...	...	...	...
34	25.7	...	25.7	...	24.0	22.8	22.0	21.5	...	...	...	...	...	...
35	25.7	...	25.7	...	22.0	19.6	18.1	17.1	...	...	...	...	...	...
36	21.9	...	21.9	...	20.4	19.4	18.7	18.3	...	...	...	...	...	...
37	21.9	...	21.9	...	18.7	16.6	15.3	14.6	...	...	...	...	...	...
38	25.7	...	25.7	...	24.0	22.8	22.0	21.5	...	...	...	...	...	...
39	25.7	...	25.7	...	22.0	19.6	18.1	17.1	...	...	...	...	...	...
40	25.7	...	25.7	...	24.0	22.8	22.0	21.5	...	...	...	...	...	...
41	25.7	...	25.7	...	22.0	19.6	18.1	17.1	...	...	...	...	...	...
42	24.9	...	24.7	...	23.3	22.4	21.8	21.4	21.2	21.0	20.8	20.6	20.3	20.0
43	24.9	...	24.7	...	22.0	19.9	18.5	17.7	17.4	17.2	17.0	16.8	16.6	16.4
44	24.9	...	24.7	...	23.3	22.4	21.8	21.4	21.2	21.0	20.8	20.6	20.3	20.0
45	24.9	...	24.7	...	22.0	19.9	18.5	17.7	17.4	17.2	17.0	16.8	16.6	16.4

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	19.1	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
43	16.2	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
44	19.1	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
45	16.2	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	21Cr-11Ni-N	Plate	SA-240	...	S30815	...	...	8	2
2	21Cr-11Ni-N	Plate	SA-240	...	S30815	...	...	8	2
3	21Cr-11Ni-N	Wld. tube	SA-249	...	S30815	...	...	8	2
4	21Cr-11Ni-N	Wld. tube	SA-249	...	S30815	...	...	8	2
5	21Cr-11Ni-N	Smls. pipe	SA-312	...	S30815	...	...	8	2
6	21Cr-11Ni-N	Smls. pipe	SA-312	...	S30815	...	...	8	2
7	21Cr-11Ni-N	Wld. pipe	SA-312	...	S30815	...	...	8	2
8	21Cr-11Ni-N	Wld. pipe	SA-312	...	S30815	...	...	8	2
9	21Cr-11Ni-N	Bar	SA-479	...	S30815	...	...	8	2
10	21Cr-11Ni-N	Bar	SA-479	...	S30815	...	...	8	2
11	22Cr-2Ni-Mo-N	Forgings	SA-182	F66	S32202	...	...	10H	1
12	22Cr-2Ni-Mo-N	Plate	SA-240	...	S32202	...	...	10H	1
13	22Cr-2Ni-Mo-N	Bar	SA-479	...	S32202	...	...	10H	1
14	22Cr-2Ni-Mo-N	Smls. tube	SA-789	...	S32202	...	...	10H	1
15	22Cr-2Ni-Mo-N	Wld. tube	SA-789	...	S32202	...	...	10H	1
16	22Cr-2Ni-Mo-N	Smls. pipe	SA-790	...	S32202	...	...	10H	1
17	22Cr-2Ni-Mo-N	Wld. pipe	SA-790	...	S32202	...	...	10H	1
18	22Cr-2Ni-Mo-N	Smls. fittings	SA-815	...	S32202	...	...	10H	1
19	22Cr-2Ni-Mo-N	Wld. fittings	SA-815	...	S32202	...	...	10H	1
20	22Cr-5Ni-3Mo-N	Castings	SA-995	4A	J92205	...	...	10H	1
21	22Cr-5Ni-3Mo-N	Forgings	SA-182	F51	S31803	...	...	10H	1
22	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...	...	10H	1
23	22Cr-5Ni-3Mo-N	Bar	SA-479	...	S31803	...	...	10H	1
24	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S31803	...	...	10H	1
25	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S31803	...	...	10H	1
26	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S31803	...	...	10H	1
27	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S31803	...	...	10H	1
28	22Cr-5Ni-3Mo-N	Smls. fittings	SA-815	...	S31803	...	...	10H	1
29	22Cr-5Ni-3Mo-N	Wld. fittings	SA-815	...	S31803	...	...	10H	1
30	22Cr-5Ni-3Mo-N	Smls. & wld. fittings	SA-815	...	S31803	...	...	10H	1
31	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S32205	...	...	10H	1
32	22Cr-5Ni-3Mo-N	Bar	SA-479	...	S32205	...	...	10H	1
33	22Cr-5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S32205	...	...	10H	1
34	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S32205	...	...	10H	1
35	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S32205	...	...	10H	1
36	22Cr-5Ni-3Mo-N	Smls. & wld. fittings	SA-815	...	S32205	...	...	10H	1
37	22Cr-5Ni-3Mo-N	Smls. fittings	SA-815	...	S32205	...	...	10H	1
38	22Cr-5Ni-3Mo-N	Wld. fittings	SA-815	...	S32205	...	...	10H	1
39	22Cr-5Ni-3Mo-N	Forgings	SA-182	F60	S32205	...	...	10H	1
40	22Cr-5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S32205	...	...	10H	1
41	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S32205	...	...	10H	1
42	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S32205	...	...	10H	1
43	22Cr-13Ni-5Mn	Castings	SA-351	CG6MMN	J93790	...	...	8	3
44	22Cr-13Ni-5Mn	Forgings	SA-182	FXM-19	S20910	...	...	8	3
45	22Cr-13Ni-5Mn	Smls. tube	SA-213	XM-19	S20910	...	...	8	3

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	87	45	1650	NP	1650	650	HA-6	G5, G6, T5
2	87	45	1650	NP	1650	650	HA-6	G6, T6
3	87	45	1650	NP	1650	650	HA-6	G5, G6, G24, T5
4	87	45	1650	NP	1650	650	HA-6	G6, G24, T6
5	87	45	1650	NP	1650	650	HA-6	G5, G6, T5
6	87	45	1650	NP	1650	650	HA-6	G6, T6
7	87	45	1650	NP	1650	650	HA-6	G5, G6, G24, T5
8	87	45	1650	NP	1650	650	HA-6	G6, G24, T6
9	87	45	1650	NP	1650	650	HA-6	G5, G6, T5
10	87	45	1650	NP	1650	650	HA-6	G6, T6
11	94	65	NP	NP	600	NP	HA-5	G19
12	94	65	NP	NP	600	NP	HA-5	G19
13	94	65	NP	NP	600	NP	HA-5	G19
14	94	65	NP	NP	600	NP	HA-5	G19
15	94	65	NP	NP	600	NP	HA-5	G19, G24
16	94	65	NP	NP	600	NP	HA-5	G19
17	94	65	NP	NP	600	NP	HA-5	G19, G24
18	94	65	NP	NP	600	NP	HA-5	G19
19	94	65	NP	NP	600	NP	HA-5	G3, G19
20	90	60	NP	NP	500	NP	HA-5	G1, G19
21	90	65	600	NP	600	600	HA-5	G19
22	90	65	600	NP	600	600	HA-5	G19
23	90	65	600	NP	600	NP	HA-5	G19
24	90	65	600	NP	600	600	HA-5	G19
25	90	65	600	NP	600	600	HA-5	G19, G24
26	90	65	600	NP	600	600	HA-5	G19
27	90	65	600	NP	600	600	HA-5	G19, G24
28	90	65	600	NP	NP	NP	HA-5	G19
29	90	65	600	NP	NP	NP	HA-5	G19, G24
30	90	65	NP	NP	600	600	HA-5	G19, W14
31	95	65	NP	600	600	600	HA-5	G19
32	95	65	NP	600	600	NP	HA-5	G19
33	95	65	NP	600	NP	NP	HA-5	G19, W12
34	95	65	NP	NP	600	600	HA-5	G19
35	95	65	NP	NP	600	600	HA-5	G19, G24
36	95	65	NP	600	NP	NP	HA-5	G19, W12
37	95	65	NP	NP	600	600	HA-5	G19
38	95	65	NP	NP	600	600	HA-5	G19, G24
39	95	70	NP	600	600	600	HA-5	G19
40	95	70	NP	600	NP	NP	HA-5	G19, W12
41	95	70	NP	NP	600	600	HA-5	G19
42	95	70	NP	NP	600	600	HA-5	G19, G24
43	85	42.5	NP	NP	1050	650	HA-2	G1
44	100	55	NP	800	1200	650	HA-6	G5, T8
45	100	55	NP	NP	1200	NP	HA-6	T8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	24.9	...	24.7	...	23.3	22.4	21.8	21.4	21.2	21.0	20.8	20.6	20.3	20.0
2	24.9	...	24.7	...	22.0	19.9	18.5	17.7	17.4	17.2	17.0	16.8	16.6	16.4
3	21.1	...	21.0	...	19.8	19.1	18.5	18.2	18.0	17.8	17.7	17.5	17.3	17.0
4	21.1	...	21.0	...	18.7	16.9	15.8	15.0	14.8	14.6	14.5	14.3	14.2	14.0
5	24.9	...	24.7	...	23.3	22.4	21.8	21.4	21.2	21.0	20.8	20.6	20.3	20.0
6	24.9	...	24.7	...	22.0	19.9	18.5	17.7	17.4	17.2	17.0	16.8	16.6	16.4
7	21.1	...	21.0	...	19.8	19.1	18.5	18.2	18.0	17.8	17.7	17.5	17.3	17.0
8	21.1	...	21.0	...	18.7	16.9	15.8	15.0	14.8	14.6	14.5	14.3	14.2	14.0
9	24.9	...	24.7	...	23.3	22.4	21.8	21.4	21.2	21.0	20.8	20.6	20.3	20.0
10	24.9	...	24.7	...	22.0	19.9	18.5	17.7	17.4	17.2	17.0	16.8	16.6	16.4
11	26.9	26.9	26.6	25.5	24.9	24.7	24.7	24.7	...	...	...	...	...	...
12	26.9	26.9	26.6	25.5	24.9	24.7	24.7	24.7	...	...	...	...	...	...
13	26.9	26.9	26.6	25.5	24.9	24.7	24.7	24.7	...	...	...	...	...	...
14	26.9	26.9	26.6	25.5	24.9	24.7	24.7	24.7	...	...	...	...	...	...
15	22.8	22.8	22.6	21.7	21.1	21.0	21.0	21.0	...	...	...	...	...	...
16	26.9	26.9	26.6	25.5	24.9	24.7	24.7	24.7	...	...	...	...	...	...
17	22.8	22.8	22.6	21.7	21.1	21.0	21.0	21.0	...	...	...	...	...	...
18	26.9	26.9	26.6	25.5	24.9	24.7	24.7	24.7	...	...	...	...	...	...
19	22.8	22.8	22.6	21.7	21.1	21.0	21.0	21.0	...	...	...	...	...	...
20	25.7	25.7	25.7	25.2	24.6	24.3	24.3	...	...	...	...	...	...	...
21	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
22	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
23	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
24	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
25	21.9	...	21.9	...	21.1	20.3	19.8	19.6	...	...	...	...	...	...
26	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
27	21.9	...	21.9	...	21.1	20.3	19.8	19.6	...	...	...	...	...	...
28	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
29	21.9	...	21.9	...	21.1	20.3	19.8	19.6	...	...	...	...	...	...
30	25.7	...	25.7	...	24.8	23.9	23.3	23.1	...	...	...	...	...	...
31	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
32	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
33	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
34	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
35	23.1	...	23.0	...	22.3	21.4	20.9	20.7	...	...	...	...	...	...
36	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
37	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
38	23.1	...	23.0	...	22.3	21.4	20.9	20.7	...	...	...	...	...	...
39	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
40	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
41	27.1	...	27.1	...	26.2	25.2	24.6	24.3	...	...	...	...	...	...
42	23.1	...	23.0	...	22.3	21.4	20.9	20.7	...	...	...	...	...	...
43	19.4	...	19.3	...	17.8	16.8	16.0	15.4	15.2	14.9	14.7	14.6	14.4	14.2
44	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	23.9	23.6
45	28.6	...	28.4	...	26.9	26.0	25.5	25.0	24.6	24.2	23.9	23.5	23.3	23.0

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	19.1	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
2	16.2	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
3	16.3	12.7	9.9	7.7	5.9	4.4	3.4	2.6	2.0	1.6	1.4	1.1	0.85	0.73	0.60
4	13.8	12.7	9.9	7.7	5.9	4.4	3.4	2.6	2.0	1.6	1.4	1.1	0.85	0.73	0.60
5	19.1	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
6	16.2	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
7	16.3	12.7	9.9	7.7	5.9	4.4	3.4	2.6	2.0	1.6	1.4	1.1	0.85	0.73	0.60
8	13.8	12.7	9.9	7.7	5.9	4.4	3.4	2.6	2.0	1.6	1.4	1.1	0.85	0.73	0.60
9	19.1	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
10	16.2	14.9	11.6	9.0	6.9	5.2	4.0	3.1	2.4	1.9	1.6	1.3	1.0	0.86	0.71
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	14.1	13.9	13.6	...	...	...	...	...	...	...	...	...	...	...	...
44	23.2	22.8	22.3	20.4	13.0	8.3	...	...	...	...	...	...	...	...	...
45	22.7	22.5	22.2	20.4	13.0	8.3	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Condition/	Size/Thickness,	Group
					Design/UNS No.			
						Temper	in.	P-No.
1	22Cr-13Ni-5Mn	Plate	SA-240	XM-19	S20910	...	...	8
2	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...	...	8
3	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...	...	8
4	22Cr-13Ni-5Mn	Smls. & wld. pipe	SA-312	TPXM-19	S20910	...	...	8
5	22Cr-13Ni-5Mn	Smls. pipe	SA-312	TPXM-19	S20910	...	...	8
6	22Cr-13Ni-5Mn	Wld. pipe	SA-312	TPXM-19	S20910	...	...	8
7	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	1	...	8
8	22Cr-13Ni-5Mn	Smls. & wld. fittings	SA-403	XM-19	S20910	...	...	8
9	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	...	...	8
10	22Cr-13Ni-5Mn	Wld. pipe	SA-813	TPXM-19	S20910	...	...	8
11	22Cr-13Ni-5Mn	Wld. pipe	SA-814	TPXM-19	S20910	...	...	8
12	23Cr-4Ni-Mo-Cu-N	Plate	SA-240	...	S32304	...	...	10H
13	23Cr-4Ni-Mo-Cu-N	Smls. tube	SA-789	...	S32304	...	>1	10H
14	23Cr-4Ni-Mo-Cu-N	Wld. tube	SA-789	...	S32304	...	>1	10H
15	23Cr-4Ni-Mo-Cu-N	Smls. pipe	SA-790	...	S32304	...	...	10H
16	23Cr-4Ni-Mo-Cu-N	Wld. pipe	SA-790	...	S32304	...	...	10H
17	23Cr-4Ni-Mo-Cu-N	Smls. tube	SA-789	...	S32304	...	≤1	10H
18	23Cr-4Ni-Mo-Cu-N	Wld. tube	SA-789	...	S32304	...	≤1	10H
19	23Cr-12Ni	Smls. & wld. fittings	SA-403	309	S30900	...	...	8
20	23Cr-12Ni	Smls. tube	SA-213	TP309S	S30908	...	...	8
21	23Cr-12Ni	Smls. tube	SA-213	TP309S	S30908	...	...	8
22	23Cr-12Ni	Plate	SA-240	309S	S30908	...	...	8
23	23Cr-12Ni	Plate	SA-240	309S	S30908	...	...	8
24	23Cr-12Ni	Wld. tube	SA-249	TP309S	S30908	...	...	8
25	23Cr-12Ni	Wld. tube	SA-249	TP309S	S30908	...	...	8
26	23Cr-12Ni	Smls. & wld. pipe	SA-312	TP309S	S30908	...	...	8
27	23Cr-12Ni	Smls. pipe	SA-312	TP309S	S30908	...	...	8
28	23Cr-12Ni	Wld. pipe	SA-312	TP309S	S30908	...	...	8
29	23Cr-12Ni	Wld. pipe	SA-312	TP309S	S30908	...	...	8
30	23Cr-12Ni	Wld. pipe	SA-312	TP309S	S30908	...	...	8
31	23Cr-12Ni	Wld. pipe	SA-312	TP309S	S30908	...	...	8
32	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	1	...	8
33	23Cr-12Ni	Bar	SA-479	309S	S30908	...	...	8
34	23Cr-12Ni	Bar	SA-479	309S	S30908	...	...	8
35	23Cr-12Ni	Wld. pipe	SA-813	TP309S	S30908	...	...	8
36	23Cr-12Ni	Wld. pipe	SA-813	TP309S	S30908	...	...	8
37	23Cr-12Ni	Wld. pipe	SA-814	TP309S	S30908	...	...	8
38	23Cr-12Ni	Wld. pipe	SA-814	TP309S	S30908	...	...	8
39	23Cr-12Ni	Smls. tube	SA-213	TP309H	S30909	...	...	8
40	23Cr-12Ni	Smls. tube	SA-213	TP309H	S30909	...	...	8
41	23Cr-12Ni	Plate	SA-240	309H	S30909	...	...	8
42	23Cr-12Ni	Plate	SA-240	309H	S30909	...	...	8
43	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...	...	8
44	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...	...	8
45	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...	...	8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	100	55	NP	800	1200	650	HA-6	G5, T8
2	100	55	NP	800	NP	NP	HA-6	G5, W12
3	100	55	NP	NP	1200	650	HA-6	G24, T8
4	100	55	NP	800	NP	NP	HA-6	G5, W12
5	100	55	NP	NP	1200	650	HA-6	T8
6	100	55	NP	NP	1200	650	HA-6	G24, T8
7	100	55	NP	800	NP	NP	HA-6	G5, W12
8	100	55	NP	800	1200	650	HA-6	G5, T8, W12, W14
9	100	55	NP	800	1200	650	HA-6	G5, G22, T8
10	100	55	NP	800	NP	NP	HA-6	G5, W12
11	100	55	NP	800	NP	NP	HA-6	G5, W12
12	87	58	NP	NP	600	600	HA-6	G19
13	87	58	NP	NP	600	600	HA-6	G19
14	87	58	NP	NP	600	600	HA-6	G19, G24
15	87	58	NP	NP	600	600	HA-6	G19
16	87	58	NP	NP	600	600	HA-6	G19, G24
17	100	65	NP	NP	600	600	HA-5	G19
18	100	65	NP	NP	600	600	HA-5	G19, G24
19	75	30	NP	800	1500	650	HA-2	G5, G12, T5, W12, W14
20	75	30	1500	NP	1500	650	HA-2	G5, G12, T5
21	75	30	1500	NP	1500	650	HA-2	G12, T6
22	75	30	1500	800	1500	650	HA-2	G5, G12, T5
23	75	30	1500	NP	1500	650	HA-2	G12, T6
24	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
25	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
26	75	30	1500	800	1500	650	HA-2	G5, G12, T5, W12, W14
27	75	30	1500	NP	1500	650	HA-2	G12, T6
28	75	30	1500	NP	NP	NP	HA-2	G5, G12, T5, W13
29	75	30	1500	NP	NP	NP	HA-2	G12, T6, W13
30	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G24, T5
31	75	30	1500	NP	1500	650	HA-2	G3, G12, G24, T6
32	75	30	NP	800	NP	NP	HA-2	G5, W12
33	75	30	1000	NP	1000	650	HA-2	G5, G12, G22, T5
34	75	30	1000	NP	1000	650	HA-2	G12, G22, T6
35	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
36	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
37	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
38	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
39	75	30	1500	NP	1500	NP	HA-2	G5, T6
40	75	30	1500	NP	1500	NP	HA-2	T7
41	75	30	1500	NP	1500	NP	HA-2	G5, H1, T6
42	75	30	1500	NP	1500	NP	HA-2	H1, T7
43	75	30	NP	800	NP	NP	HA-2	G5, W12
44	75	30	NP	NP	1500	NP	HA-2	G5, G24, T6
45	75	30	NP	NP	1500	NP	HA-2	G24, T7

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	23.9	23.6
2	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	...	...
3	24.3	...	24.1	...	22.9	22.1	21.6	21.2	20.9	20.6	20.3	20.0	19.8	19.5
4	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	...	...
5	28.6	...	28.4	...	26.9	26.0	25.5	25.0	24.6	24.2	23.9	23.5	23.3	23.0
6	24.3	...	24.1	...	22.9	22.1	21.6	21.2	20.9	20.6	20.3	20.0	19.8	19.5
7	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	...	...
8	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	23.9	23.6
9	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	23.9	23.6
10	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	...	...
11	28.6	...	28.4	...	26.9	26.0	25.5	25.1	24.9	24.7	24.5	24.2	...	...
12	24.9	...	24.0	...	22.5	21.7	21.3	21.0	...	...	...	...	...	...
13	24.9	...	24.0	...	22.5	21.7	21.3	21.0	...	...	...	...	...	...
14	21.1	...	20.4	...	19.1	18.5	18.1	17.9	...	...	...	...	...	...
15	24.9	...	24.0	...	22.5	21.7	21.3	21.0	...	...	...	...	...	...
16	21.1	...	20.4	...	19.1	18.5	18.1	17.9	...	...	...	...	...	...
17	28.6	...	27.6	...	25.9	25.0	24.6	24.3	...	...	...	...	...	...
18	24.3	...	23.4	...	22.0	21.3	20.9	20.6	...	...	...	...	...	...
19	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
20	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
21	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
22	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
23	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
24	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
25	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
26	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
27	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
28	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
29	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
30	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
31	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
32	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
33	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
34	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
35	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
36	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
37	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
38	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
39	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
40	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
41	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
42	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
43	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
44	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
45	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	23.2	22.8	22.3	20.4	13.0	8.3	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	19.3	19.1	18.9	17.3	11.1	7.1	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	22.7	22.5	22.2	20.4	13.0	8.3	...	...	...	...	...	...	...	...	...
6	19.3	19.1	18.9	17.3	11.1	7.1	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	23.2	22.8	22.3	20.4	13.0	8.3	...	...	...	...	...	...	...	...	...
9	23.2	22.8	22.3	20.4	13.0	8.3	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
20	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
21	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
22	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
23	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
24	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
25	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
26	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
27	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
28	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
29	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
30	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
31	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	15.9	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
34	12.5	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
35	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
36	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
37	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
38	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
39	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
40	12.5	12.3	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
41	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
42	12.5	12.3	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	14.4	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
45	10.6	10.4	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Group P-No.	No.
1	23Cr-12Ni	Smls. pipe	SA-312	TP309H	S30909	...	...	8	2
2	23Cr-12Ni	Smls. pipe	SA-312	TP309H	S30909	...	...	8	2
3	23Cr-12Ni	Wld. pipe	SA-312	TP309H	S30909	...	...	8	2
4	23Cr-12Ni	Wld. pipe	SA-312	TP309H	S30909	...	...	8	2
5	23Cr-12Ni	Bar	SA-479	309H	S30909	...	...	8	2
6	23Cr-12Ni	Bar	SA-479	309H	S30909	...	...	8	2
7	23Cr-12Ni-Cb	Smls. tube	SA-213	TP309Cb	S30940	...	...	8	2
8	23Cr-12Ni-Cb	Smls. tube	SA-213	TP309Cb	S30940	...	...	8	2
9	23Cr-12Ni-Cb	Plate	SA-240	309Cb	S30940	...	...	8	2
10	23Cr-12Ni-Cb	Plate	SA-240	309Cb	S30940	...	...	8	2
11	23Cr-12Ni-Cb	Wld. tube	SA-249	TP309Cb	S30940	...	...	8	2
12	23Cr-12Ni-Cb	Wld. tube	SA-249	TP309Cb	S30940	...	...	8	2
13	23Cr-12Ni-Cb	Smls. & wld. pipe	SA-312	TP309Cb	S30940	...	...	8	2
14	23Cr-12Ni-Cb	Smls. pipe	SA-312	TP309Cb	S30940	...	...	8	2
15	23Cr-12Ni-Cb	Wld. pipe	SA-312	TP309Cb	S30940	...	...	8	2
16	23Cr-12Ni-Cb	Wld. pipe	SA-312	TP309Cb	S30940	...	...	8	2
17	23Cr-12Ni-Cb	Bar	SA-479	309Cb	S30940	...	...	8	2
18	23Cr-12Ni-Cb	Bar	SA-479	309Cb	S30940	...	...	8	2
19	23Cr-12Ni-Cb	Wld. pipe	SA-813	TP309Cb	S30940	...	...	8	2
20	23Cr-12Ni-Cb	Wld. pipe	SA-813	TP309Cb	S30940	...	...	8	2
21	23Cr-12Ni-Cb	Wld. pipe	SA-814	TP309Cb	S30940	...	...	8	2
22	23Cr-12Ni-Cb	Wld. pipe	SA-814	TP309Cb	S30940	...	...	8	2
23	23Cr-25Ni-5.5Mo-N	Forgings	SA-182	...	S32053	...	...	8	4
24	23Cr-25Ni-5.5Mo-N	Forgings	SA-182	...	S32053	...	...	8	4
25	23Cr-25Ni-5.5Mo-N	Plate	SA-240	...	S32053	...	...	8	4
26	23Cr-25Ni-5.5Mo-N	Plate	SA-240	...	S32053	...	...	8	4
27	23Cr-25Ni-5.5Mo-N	Wld. tube	SA-249	...	S32053	...	...	8	4
28	23Cr-25Ni-5.5Mo-N	Wld. tube	SA-249	...	S32053	...	...	8	4
29	23Cr-25Ni-5.5Mo-N	Smls. & wld. pipe	SA-312	...	S32053	...	...	8	4
30	23Cr-25Ni-5.5Mo-N	Smls. & wld. pipe	SA-312	...	S32053	...	...	8	4
31	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-358	...	S32053	...	...	8	4
32	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-358	...	S32053	...	...	8	4
33	23Cr-25Ni-5.5Mo-N	Fittings	SA-403	...	S32053	...	...	8	4
34	23Cr-25Ni-5.5Mo-N	Fittings	SA-403	...	S32053	...	...	8	4
35	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-409	...	S32053	...	...	8	4
36	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-409	...	S32053	...	...	8	4
37	23Cr-25Ni-5.5Mo-N	Bar	SA-479	...	S32053	...	...	8	4
38	23Cr-25Ni-5.5Mo-N	Bar	SA-479	...	S32053	...	...	8	4
39	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-813	...	S32053	...	...	8	4
40	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-813	...	S32053	...	...	8	4
41	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-814	...	S32053	...	...	8	4
42	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-814	...	S32053	...	...	8	4
43	24Cr-10Ni-4Mo-N	Castings	SA-995	2A	J93345	...	...	10H	1
44	24Cr-22Ni-6Mo-2W-Cu-N	Forgings	SA-182	F58	S31266	...	...	45	...
45	24Cr-22Ni-6Mo-2W-Cu-N	Smls. tube	SA-213	...	S31266	...	...	45	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	1500	NP	1500	NP	HA-2	G5, T6
2	75	30	1500	NP	1500	NP	HA-2	T7
3	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, T6
4	75	30	1500	NP	1500	NP	HA-2	G3, G24, T7
5	75	30	1500	NP	1500	NP	HA-2	G5, T6
6	75	30	1500	NP	1500	NP	HA-2	T7
7	75	30	NP	NP	1500	650	HA-2	G5, G12, T5
8	75	30	NP	NP	1500	650	HA-2	G12, T6
9	75	30	NP	NP	1500	650	HA-2	G5, G12, T5
10	75	30	NP	NP	1500	650	HA-2	G12, T6
11	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
12	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
13	75	30	NP	800	1500	650	HA-2	G5, G12, T5, W12
14	75	30	NP	NP	1500	650	HA-2	G12, T6
15	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
16	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
17	75	30	NP	NP	1000	650	HA-2	G5, G12, G22
18	75	30	NP	NP	1000	650	HA-2	G12, G22
19	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
20	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
21	75	30	NP	NP	1500	650	HA-2	G5, G12, G13, G24, T5
22	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
23	93	43	NP	NP	662	NP	NFN-12	G5
24	93	43	NP	NP	662	NP	NFN-12	...
25	93	43	NP	NP	662	NP	NFN-12	G5
26	93	43	NP	NP	662	NP	NFN-12	...
27	93	43	NP	NP	662	NP	NFN-12	G5, W12
28	93	43	NP	NP	662	NP	NFN-12	W12
29	93	43	NP	NP	662	NP	NFN-12	G5, W12
30	93	43	NP	NP	662	NP	NFN-12	W12
31	93	43	NP	NP	662	NP	NFN-12	G5, W12
32	93	43	NP	NP	662	NP	NFN-12	W12
33	93	43	NP	NP	662	NP	NFN-12	G5
34	93	43	NP	NP	662	NP	NFN-12	...
35	93	43	NP	NP	662	NP	NFN-12	G5, W12
36	93	43	NP	NP	662	NP	NFN-12	W12
37	93	43	NP	NP	662	NP	NFN-12	G5
38	93	43	NP	NP	662	NP	NFN-12	...
39	93	43	NP	NP	662	NP	NFN-12	G5, G12, W12
40	93	43	NP	NP	662	NP	NFN-12	G12, W12
41	93	43	NP	NP	662	NP	NFN-12	G5, G12, W12
42	93	43	NP	NP	662	NP	NFN-12	G12, W12
43	95	65	NP	NP	600	600	HA-5	G1, G19
44	109	61	NP	NP	800	NP	HA-10	G19
45	109	61	NP	NP	800	NP	HA-10	G5, G19

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
2	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
3	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
4	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
5	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
6	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
7	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
8	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
9	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
10	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
11	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
12	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
13	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
14	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
15	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
16	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
17	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	17.5	17.2
18	20.0	...	17.5	...	16.1	15.1	14.4	13.9	13.7	13.5	13.3	13.1	12.9	12.7
19	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
20	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
21	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	14.8	14.6
22	17.0	...	14.9	...	13.7	12.8	12.2	11.8	11.6	11.5	11.3	11.2	11.0	10.8
23	26.5	...	26.5	...	25.1	23.9	23.0	22.3	22.0	21.8	...	...	...	...
24	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
25	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
26	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
27	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
28	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
29	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
30	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
31	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
32	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
33	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
34	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
35	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
36	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
37	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
38	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
39	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
40	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
41	26.5	...	26.5	...	25.1	23.9	23.3	22.3	22.0	21.8	...	...	...	...
42	26.5	...	24.2	...	21.9	20.8	19.3	18.5	18.2	17.9	...	...	...	...
43	27.1	...	27.1	...	25.1	24.2	24.2	24.2	...	...	...	...	...	...
44	31.1	31.1	30.8	29.8	28.9	27.7	26.9	26.3	26.1	25.9	25.7	25.4	...	...
45	31.1	31.1	30.8	29.8	28.9	27.7	26.9	26.3	26.1	25.9	25.7	25.4	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
2	12.5	12.3	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
3	14.4	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
4	10.6	10.4	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
5	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
6	12.5	12.3	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	1.0	0.75	...	...	...
7	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
8	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
9	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
10	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
11	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
12	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
13	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
14	12.5	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
15	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
16	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
17	15.9	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
18	12.5	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
19	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
20	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
21	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
22	10.6	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/	Size/Thickness, in.	Group
					Design/UNS No.	Condition/Temper		
1	24Cr-22Ni-6Mo-2W-Cu-N	Plate	SA-240	...	S31266	...	...	45
2	24Cr-22Ni-6Mo-2W-Cu-N	Wld. tube	SA-249	...	S31266	...	...	45
3	24Cr-22Ni-6Mo-2W-Cu-N	Smls. pipe	SA-312	...	S31266	...	...	45
4	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-312	...	S31266	...	...	45
5	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-358	...	S31266	...	...	45
6	24Cr-22Ni-6Mo-2W-Cu-N	Smls. fittings	SA-403	...	S31266	...	...	45
7	24Cr-22Ni-6Mo-2W-Cu-N	Wld. fittings	SA-403	...	S31266	...	...	45
8	24Cr-22Ni-6Mo-2W-Cu-N	Bar, shapes	SA-479	...	S31266	...	...	45
9	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-813	...	S31266	...	...	45
10	25Cr-4Ni-4Mo-Ti	Plate	SA-240	...	S44635	...	...	10I
11	25Cr-4Ni-4Mo-Ti	Wld. tube	SA-268	...	S44635	...	...	10I
12	25Cr-5Ni-3Mo-2Cu	Castings	SA-995	1B	J93372	...	...	10H
13	25Cr-5Ni-3Mo-2Cu	Plate	SA-240	...	S32550	...	...	10H
14	25Cr-5Ni-3Mo-2Cu	Bar	SA-479	...	S32550	...	...	10H
15	25Cr-5Ni-3Mo-2Cu	Smls. tube	SA-789	...	S32550	...	...	10H
16	25Cr-5Ni-3Mo-2Cu	Wld. tube	SA-789	...	S32550	...	...	10H
17	25Cr-5Ni-3Mo-2Cu	Smls. pipe	SA-790	...	S32550	...	...	10H
18	25Cr-5Ni-3Mo-2Cu	Wld. pipe	SA-790	...	S32550	...	...	10H
19	25Cr-6Ni-Mo-N	Forgings	SA-182	...	S32506	...	...	10H
20	25Cr-6Ni-Mo-N	Plate, sheet	SA-240	...	S32506	...	...	10H
21	25Cr-6Ni-Mo-N	Bar	SA-479	...	S32506	...	...	10H
22	25Cr-6Ni-Mo-N	Smls. tube	SA-789	...	S32506	...	...	10H
23	25Cr-6Ni-Mo-N	Wld. tube	SA-789	...	S32506	...	...	10H
24	25Cr-6Ni-Mo-N	Smls. pipe	SA-790	...	S32506	...	...	10H
25	25Cr-6Ni-Mo-N	Wld. pipe	SA-790	...	S32506	...	...	10H
26	25Cr-6Ni-Mo-N	Plate	SA-240	...	S31200	...	...	10H
27	25Cr-6.5Ni-3Mo-N	Smls. tube	SA-789	...	S31260	...	...	10H
28	25Cr-6.5Ni-3Mo-N	Wld. tube	SA-789	...	S31260	...	...	10H
29	25Cr-6.5Ni-3Mo-N	Smls. pipe	SA-790	...	S31260	...	...	10H
30	25Cr-6.5Ni-3Mo-N	Wld. pipe	SA-790	...	S31260	...	...	10H
31	25Cr-6.5Ni-3Mo-N	Plate	SA-240	...	S31260	...	...	10H
32	25Cr-7Ni-3Mo-W-Cu-N	Forgings	SA-182	F54	S39274	...	...	10H
33	25Cr-7Ni-3Mo-W-Cu-N	Smls. tube	SA-789	...	S39274	...	...	10H
34	25Cr-7Ni-3Mo-W-Cu-N	Wld. tube	SA-789	...	S39274	...	...	10H
35	25Cr-7Ni-3Mo-W-Cu-N	Smls. pipe	SA-790	...	S39274	...	...	10H
36	25Cr-7Ni-3Mo-W-Cu-N	Wld. pipe	SA-790	...	S39274	...	...	10H
37	25Cr-7Ni-4Mo-N	Forgings	SA-182	F53	S32750	...	...	10H
38	25Cr-7Ni-4Mo-N	Plate, sheet	SA-240	...	S32750	...	...	10H
39	25Cr-7Ni-4Mo-N	Smls. tube	SA-789	...	S32750	...	...	10H
40	25Cr-7Ni-4Mo-N	Wld. tube	SA-789	...	S32750	...	...	10H
41	25Cr-7Ni-4Mo-N	Smls. pipe	SA-790	...	S32750	...	...	10H
42	25Cr-7Ni-4Mo-N	Wld. pipe	SA-790	...	S32750	...	...	10H
43	25Cr-7.5Ni-3.5Mo-N-Cu-W	Castings	SA-995	CD3MWCuN	J93380	...	...	10H
44	25Cr-7.5Ni-3.5Mo-N-Cu-W	Forgings	SA-182	F55	S32760	...	...	10H
45	25Cr-7.5Ni-3.5Mo-N-Cu-W	Plate	SA-240	...	S32760	...	...	10H

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	109	61	NP	NP	800	NP	HA-10	G19
2	109	61	NP	NP	800	NP	HA-10	G3, G5, G19
3	109	61	NP	NP	800	NP	HA-10	G5, G19
4	109	61	NP	NP	800	NP	HA-10	G3, G5, G19
5	109	61	NP	NP	800	NP	HA-10	G3, G19
6	109	61	NP	NP	800	NP	HA-10	G5, G19
7	109	61	NP	NP	800	NP	HA-10	G3, G5, G19
8	109	61	NP	NP	800	NP	HA-10	G5, G19
9	109	61	NP	NP	800	NP	HA-10	G3, G5, G19
10	90	75	NP	NP	500	500	HA-5	G19
11	90	75	NP	NP	500	500	HA-5	G19, G24
12	100	70	NP	600	NP	NP	HA-5	G19, G29
13	110	80	NP	NP	500	500	HA-5	G19
14	110	80	NP	NP	500	500	HA-5	G19
15	110	80	NP	NP	500	500	HA-5	G19
16	110	80	NP	NP	500	500	HA-5	G19, G24
17	110	80	NP	NP	500	500	HA-5	G19
18	110	80	NP	NP	500	500	HA-5	G19, G24
19	90	65	NP	NP	600	NP	HA-5	G19
20	90	65	NP	NP	600	NP	HA-5	G19
21	90	65	NP	NP	600	NP	HA-5	G19
22	90	65	NP	NP	600	NP	HA-5	G19
23	90	65	NP	NP	600	NP	HA-5	G19, G24
24	90	65	NP	NP	600	NP	HA-5	G19
25	90	65	NP	NP	600	NP	HA-5	G19, G24
26	100	65	NP	NP	600	600	HA-5	G19
27	100	65	NP	NP	650	650	HA-5	G19
28	100	65	NP	NP	650	650	HA-5	G19, G24
29	100	65	NP	NP	650	650	HA-5	G19
30	100	65	NP	NP	650	650	HA-5	G19, G24
31	100	70	NP	NP	650	650	HA-5	G19
32	116	80	NP	NP	650	650	HA-8	G19
33	116	80	NP	NP	650	650	HA-8	G19
34	116	80	NP	NP	650	650	HA-8	G19, G24
35	116	80	NP	NP	650	650	HA-8	G19
36	116	80	NP	NP	650	650	HA-8	G19, G24
37	116	80	NP	NP	600	NP	HA-5	G19
38	116	80	NP	NP	600	NP	HA-5	G19
39	116	80	NP	NP	600	600	HA-5	G19
40	116	80	NP	NP	600	600	HA-5	G19, G24
41	116	80	NP	NP	600	600	HA-5	G19
42	116	80	NP	NP	600	600	HA-5	G19, G24
43	100	65	NP	NP	600	NP	HA-5	G19, H4
44	109	80	NP	NP	600	NP	HA-9	G19, H4
45	109	80	NP	NP	600	NP	HA-9	G19

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	31.1	31.1	30.8	29.8	28.9	27.7	26.9	26.3	26.1	25.9	25.7	25.4	...	...
2	26.5	26.5	26.1	25.3	24.6	23.5	22.8	22.4	22.2	22.0	21.8	21.6	...	...
3	31.1	31.1	30.8	29.8	28.9	27.7	26.9	26.3	26.1	25.9	25.7	25.4	...	...
4	26.5	26.5	26.1	25.3	24.6	23.5	22.8	22.4	22.2	22.0	21.8	21.6	...	...
5	26.5	26.5	26.1	25.3	24.6	23.5	22.8	22.4	22.2	22.0	21.8	21.6	...	...
6	31.1	31.1	30.8	29.8	28.9	27.7	26.9	26.3	26.1	25.9	25.7	25.4	...	...
7	26.5	26.5	26.1	25.3	24.6	23.5	22.8	22.4	22.2	22.0	21.8	21.6	...	...
8	31.1	31.1	30.8	29.8	28.9	27.7	26.9	26.3	26.1	25.9	25.7	25.4	...	...
9	26.5	26.5	26.1	25.3	24.6	23.5	22.8	22.4	22.2	22.0	21.8	21.6	...	...
10	25.7	...	24.9	...	23.5	22.5	22.0	...	...	...	...	...	...	...
11	21.9	...	21.2	...	19.9	19.1	18.7	...	...	...	...	...	...	...
12	28.6	...	28.6	...	27.9	27.5	27.5	27.4	...	...	...	...	...	...
13	31.4	...	31.3	...	29.5	28.6	28.2	...	...	...	...	...	...	...
14	31.4	...	31.3	...	29.5	28.6	28.2	...	...	...	...	...	...	...
15	31.4	...	31.3	...	29.5	28.6	28.2	...	...	...	...	...	...	...
16	26.7	...	26.6	...	25.1	24.3	24.0	...	...	...	...	...	...	...
17	31.4	...	31.3	...	29.5	28.6	28.2	...	...	...	...	...	...	...
18	26.7	...	26.6	...	25.1	24.3	24.0	...	...	...	...	...	...	...
19	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
20	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
21	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
22	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
23	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
24	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
25	25.7	...	25.7	...	24.4	24.1	24.1	24.1	...	...	...	...	...	...
26	28.6	...	28.6	...	27.1	26.3	26.1	26.1	...	...	...	...	...	...
27	28.6	...	28.5	...	27.1	26.4	26.3	26.3	26.3	...	...	...	...	...
28	24.3	...	24.3	...	23.0	22.5	22.4	22.4	22.4	...	...	...	...	...
29	28.6	...	28.5	...	27.1	26.4	26.3	26.3	26.3	...	...	...	...	...
30	24.3	...	24.3	...	23.0	22.5	22.4	22.4	22.4	...	...	...	...	...
31	28.6	...	28.5	...	27.1	26.4	26.3	26.3	26.3	...	...	...	...	...
32	33.1	...	33.1	...	31.6	31.4	31.4	31.4	31.4	...	...	...	...	...
33	33.1	...	33.1	...	31.6	31.4	31.4	31.4	31.4	...	...	...	...	...
34	28.2	...	28.2	...	26.8	26.7	26.7	26.7	26.7	...	...	...	...	...
35	33.1	...	33.1	...	31.6	31.4	31.4	31.4	31.4	...	...	...	...	...
36	28.2	...	28.2	...	26.8	26.7	26.7	26.7	26.7	...	...	...	...	...
37	33.1	...	33.0	...	31.2	30.1	29.6	29.4	...	...	...	...	...	...
38	33.1	...	33.0	...	31.2	30.1	29.6	29.4	...	...	...	...	...	...
39	33.1	...	33.0	...	31.2	30.1	29.6	29.4	...	...	...	...	...	...
40	28.2	...	28.0	...	26.5	25.6	25.2	25.0	...	...	...	...	...	...
41	33.1	...	33.0	...	31.2	30.1	29.6	29.4	...	...	...	...	...	...
42	28.2	...	28.0	...	26.5	25.6	25.2	25.0	...	...	...	...	...	...
43	28.6	28.5	28.4	27.7	26.9	26.6	26.6	26.6	...	...	...	...	...	...
44	31.1	...	30.2	...	29.2	29.2	29.2	29.2	...	...	...	...	...	...
45	31.1	...	30.2	...	29.2	29.2	29.2	29.2	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3;* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	25Cr-7.5Ni-3.5Mo-N-Cu-W	Bar	SA-479	...	S32760	Annealed	...	10H	1
2	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. tube	SA-789	...	S32760	...	...	10H	1
3	25Cr-7.5Ni-3.5Mo-N-Cu-W	Wld. tube	SA-789	...	S32760	...	...	10H	1
4	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. pipe	SA-790	...	S32760	...	...	10H	1
5	25Cr-7.5Ni-3.5Mo-N-Cu-W	Wld. pipe	SA-790	...	S32760	...	...	10H	1
6	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. fittings	SA-815	...	S32760	...	...	10H	1
7	25Cr-12Ni	Castings	SA-351	CH8	J93400	...	...	8	2
8	25Cr-12Ni	Castings	SA-351	CH8	J93400	...	...	8	2
9	25Cr-12Ni	Cast pipe	SA-451	CPH8	J93400	...	...	8	2
10	25Cr-12Ni	Castings	SA-351	CH20	J93402	...	...	8	2
11	25Cr-12Ni	Castings	SA-351	CH20	J93402	...	...	8	2
12	25Cr-12Ni	Cast pipe	SA-451	CPH20	J93402	...	...	8	2
13	25Cr-20Ni	Castings	SA-351	CK20	J94202	...	...	8	2
14	25Cr-20Ni	Castings	SA-351	CK20	J94202	...	...	8	2
15	25Cr-20Ni	Cast pipe	SA-451	CPK20	J94202	...	...	8	2
16	25Cr-20Ni	Forgings	SA-182	F310	S31000	...	>5	8	2
17	25Cr-20Ni	Forgings	SA-182	F310	S31000	...	≤5	8	2
18	25Cr-20Ni	Forgings	SA-965	F310	S31000	...	...	8	2
(23) 19	25Cr-20Ni	Smls. tube	SA-213	...	S31002	...	...	8	2
(23) 20	25Cr-20Ni	Smls. tube	SA-213	...	S31002	...	...	8	2
(23) 21	25Cr-20Ni	Smls. pipe	SA-312	...	S31002	...	...	8	2
(23) 22	25Cr-20Ni	Smls. pipe	SA-312	...	S31002	...	...	8	2
23	25Cr-20Ni	Smls. tube	SA-213	TP310S	S31008	...	...	8	2
24	25Cr-20Ni	Smls. tube	SA-213	TP310S	S31008	...	...	8	2
25	25Cr-20Ni	Plate	SA-240	310S	S31008	...	...	8	2
26	25Cr-20Ni	Plate	SA-240	310S	S31008	...	...	8	2
27	25Cr-20Ni	Wld. tube	SA-249	TP310S	S31008	...	...	8	2
28	25Cr-20Ni	Wld. tube	SA-249	TP310S	S31008	...	...	8	2
29	25Cr-20Ni	Smls. & wld. pipe	SA-312	TP310S	S31008	...	...	8	2
30	25Cr-20Ni	Smls. pipe	SA-312	TP310S	S31008	...	...	8	2
31	25Cr-20Ni	Wld. pipe	SA-312	TP310S	S31008	...	...	8	2
32	25Cr-20Ni	Wld. pipe	SA-312	TP310S	S31008	...	...	8	2
33	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	1	...	8	2
34	25Cr-20Ni	Smls. & wld. fittings	SA-403	310S	S31008	...	...	8	2
35	25Cr-20Ni	Bar	SA-479	310S	S31008	...	...	8	2
36	25Cr-20Ni	Bar	SA-479	310S	S31008	...	...	8	2
37	25Cr-20Ni	Wld. pipe	SA-813	TP310S	S31008	...	...	8	2
38	25Cr-20Ni	Wld. pipe	SA-813	TP310S	S31008	...	...	8	2
39	25Cr-20Ni	Wld. pipe	SA-814	TP310S	S31008	...	...	8	2
40	25Cr-20Ni	Wld. pipe	SA-814	TP310S	S31008	...	...	8	2
41	25Cr-20Ni	Bar	SA/JIS G4303	SUS310S	...	...	...	8	2
42	25Cr-20Ni	Smls. tube	SA-213	TP310H	S31009	...	...	8	2
43	25Cr-20Ni	Plate	SA-240	310H	S31009	...	...	8	2
44	25Cr-20Ni	Plate	SA-240	310H	S31009	...	...	8	2
45	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009	...	...	8	2

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	109	80	NP	NP	600	NP	HA-9	G19
2	109	80	NP	NP	600	NP	HA-9	G19
3	109	80	NP	NP	600	NP	HA-9	G19, G24
4	109	80	NP	NP	600	NP	HA-9	G19
5	109	80	NP	NP	600	NP	HA-9	G19, G24
6	109	80	NP	NP	600	NP	HA-9	G19, W14
7	65	28	NP	800	1500	650	HA-3	G1, G5, G12, G16, G17, G19, T6
8	65	28	NP	NP	1500	650	HA-3	G1, G12, G19, T7
9	65	28	NP	800	NP	NP	HA-3	G5, G16, G17, G19
10	70	30	NP	800	1500	650	HA-2	G1, G5, G12, G16, G17, T6
11	70	30	NP	NP	1500	650	HA-2	G1, G12, T7
12	70	30	NP	800	NP	NP	HA-2	G5, G16, G17
13	65	28	NP	800	1500	650	HA-3	G1, G5, G12, G16, G17, T6
14	65	28	NP	NP	1500	650	HA-3	G1, G12, T8
15	65	28	NP	800	NP	NP	HA-3	G5, G16, G17
16	70	30	NP	800	NP	NP	HA-2	G5
17	75	30	NP	800	1500	650	HA-2	G5, G12, G14, T5
18	75	30	NP	800	1500	650	HA-2	G5, G12, T5
19	73	30	NP	NP	842	NP	HA-2	G5
20	73	30	NP	NP	842	NP	HA-2	...
21	73	30	NP	NP	842	NP	HA-2	G5
22	73	30	NP	NP	842	NP	HA-2	...
23	75	30	1500	NP	1500	650	HA-2	G5, G12, T5
24	75	30	1500	NP	1500	650	HA-2	G12, T6
25	75	30	1500	800	1500	650	HA-2	G5, G12, T5
26	75	30	1500	NP	1500	650	HA-2	G12, T6
27	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
28	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
29	75	30	1500	800	1500	650	HA-2	G5, G12, T5, W12, W14
30	75	30	1500	NP	1500	650	HA-2	G12, T6
31	75	30	1500	NP	1500	650	HA-2	G3, G5, G12, G14, G24, T5
32	75	30	1500	NP	1500	650	HA-2	G3, G12, G14, G24, T6
33	75	30	NP	800	NP	NP	HA-2	G5, W12
34	75	30	NP	800	1500	650	HA-2	G5, G12, T5, W12, W14
35	75	30	1000	NP	1000	650	HA-2	G12, G22, T6
36	75	30	1000	800	1000	650	HA-2	G5, G12, G22, T5
37	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
38	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
39	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
40	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
41	75	30	1000	800	1000	NP	HA-2	G5, G12, G22, T5
42	75	30	1500	800	1500	NP	HA-2	G5, T6
43	75	30	1500	NP	1500	NP	HA-2	G5, T6
44	75	30	1500	NP	1500	NP	HA-2	T7
45	75	30	NP	800	NP	NP	HA-2	G5, W12

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	31.1	...	30.2	...	29.2	29.2	29.2	29.2	...	...	...	...	...	...
2	31.1	...	30.2	...	29.2	29.2	29.2	29.2	...	...	...	...	...	...
3	26.5	...	25.7	...	24.8	24.8	24.8	24.8	...	...	...	...	...	...
4	31.1	...	30.2	...	29.2	29.2	29.2	29.2	...	...	...	...	...	...
5	26.5	...	25.7	...	24.8	24.8	24.8	24.8	...	...	...	...	...	...
6	31.1	...	30.2	...	29.2	29.2	29.2	29.2	...	...	...	...	...	...
7	18.6	...	17.0	...	15.8	15.4	15.4	15.4	15.3	15.2	15.0	14.8	14.4	13.9
8	18.6	...	15.3	...	14.1	13.5	13.1	12.7	12.4	12.1	11.8	11.4	11.0	10.7
9	18.6	...	17.0	...	15.8	15.4	15.4	15.4	15.3	15.2	15.0	14.8	...	...
10	20.0	...	18.3	...	17.0	16.6	16.6	16.6	16.5	16.4	16.2	15.9	15.5	14.9
11	20.0	...	16.3	...	15.1	14.5	14.0	13.6	13.3	12.9	12.6	12.2	11.8	11.4
12	20.0	...	18.3	...	17.0	16.6	16.6	16.6	16.5	16.4	16.2	15.9	...	...
13	18.6	...	17.0	...	15.8	15.4	15.4	15.4	15.3	15.2	15.0	14.8	14.4	13.9
14	18.6	...	15.3	...	14.1	13.5	13.1	12.7	12.4	12.1	11.8	11.4	11.0	10.7
15	18.6	...	17.0	...	15.8	15.4	15.4	15.4	15.3	15.2	15.0	14.8	...	...
16	20.0	...	19.8	...	18.9	18.6	18.5	18.5	18.2	17.9	17.7	17.4	...	...
17	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
18	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
19	20.0	20.0	20.0	20.0	20.0	19.3	18.7	18.3	18.1	17.9	17.4	17.0	16.6	...
20	20.0	18.6	17.9	17.3	16.7	15.7	14.9	14.1	13.7	13.3	12.9	12.6	12.3	...
21	20.0	20.0	20.0	20.0	20.0	19.3	18.7	18.3	18.1	17.9	17.4	17.0	16.6	...
22	20.0	18.6	17.9	17.3	16.7	15.7	14.9	14.1	13.7	13.3	12.9	12.6	12.3	...
23	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
24	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
25	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
26	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
27	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
28	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
29	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
30	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
31	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
32	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
33	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	...	...
34	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
35	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
36	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
37	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
38	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
39	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
40	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
41	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
42	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
43	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
44	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
45	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	13.2	11.1	8.5	6.5	5.0	3.8	2.9	2.3	1.8	1.3	0.90	0.80	...	...	...
8	10.3	9.9	8.5	6.5	5.0	3.8	2.9	2.3	1.8	1.3	0.90	0.80	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	14.3	11.1	8.5	6.5	5.0	3.8	2.9	2.3	1.8	1.3	0.90	0.80	...	...	...
11	11.0	10.6	8.5	6.5	5.0	3.8	2.9	2.3	1.8	1.3	0.90	0.80	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	13.2	11.3	9.8	8.5	7.3	6.0	4.8	3.5	2.4	1.6	1.1	0.80	...	...	...
14	10.3	9.9	9.5	8.5	7.3	6.0	4.8	3.5	2.4	1.6	1.1	0.80	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
18	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
24	12.3	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
25	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
26	12.3	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
27	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
28	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
29	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
30	12.3	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
31	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
32	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
35	12.3	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
36	15.9	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
37	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
38	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
39	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
40	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
41	15.9	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
42	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
43	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
44	12.3	12.1	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009	...	...	8	2
2	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009	...	...	8	2
3	25Cr-20Ni	Smls. pipe	SA-312	TP310H	S31009	...	...	8	2
4	25Cr-20Ni	Smls. pipe	SA-312	TP310H	S31009	...	...	8	2
5	25Cr-20Ni	Wld. pipe	SA-312	TP310H	S31009	...	...	8	2
6	25Cr-20Ni	Wld. pipe	SA-312	TP310H	S31009	...	...	8	2
7	25Cr-20Ni	Bar	SA-479	310H	S31009	...	...	8	2
8	25Cr-20Ni	Bar	SA-479	310H	S31009	...	...	8	2
9	25Cr-20Ni-Cb	Smls. tube	SA-213	TP310Cb	S31040	...	...	8	2
10	25Cr-20Ni-Cb	Smls. tube	SA-213	TP310Cb	S31040	...	...	8	2
11	25Cr-20Ni-Cb	Plate	SA-240	310Cb	S31040	...	...	8	2
12	25Cr-20Ni-Cb	Plate	SA-240	310Cb	S31040	...	...	8	2
13	25Cr-20Ni-Cb	Wld. tube	SA-249	TP310Cb	S31040	...	...	8	2
14	25Cr-20Ni-Cb	Wld. tube	SA-249	TP310Cb	S31040	...	...	8	2
15	25Cr-20Ni-Cb	Smls. & wld. pipe	SA-312	TP310Cb	S31040	...	...	8	2
16	25Cr-20Ni-Cb	Smls. pipe	SA-312	TP310Cb	S31040	...	...	8	2
17	25Cr-20Ni-Cb	Wld. pipe	SA-312	TP310Cb	S31040	...	...	8	2
18	25Cr-20Ni-Cb	Wld. pipe	SA-312	TP310Cb	S31040	...	...	8	2
19	25Cr-20Ni-Cb	Bar	SA-479	310Cb	S31040	...	...	8	2
20	25Cr-20Ni-Cb	Bar	SA-479	310Cb	S31040	...	...	8	2
21	25Cr-20Ni-Cb	Wld. pipe	SA-813	TP310Cb	S31040	...	...	8	2
22	25Cr-20Ni-Cb	Wld. pipe	SA-813	TP310Cb	S31040	...	...	8	2
23	25Cr-20Ni-Cb	Wld. pipe	SA-814	TP310Cb	S31040	...	...	8	2
24	25Cr-20Ni-Cb	Wld. pipe	SA-814	TP310Cb	S31040	...	...	8	2
25	25Cr-20Ni-Cb-N	Smls. tube	SA-213	TP310HCbN	S31042	...	...	8	3
26	25Cr-20Ni-Cb-N	Smls. tube	SA-213	TP310HCbN	S31042	...	...	8	3
27	25Cr-22Ni-2Mo-N	Forgings	SA-182	F310MoLN	S31050	...	...	8	2
28	25Cr-22Ni-2Mo-N	Forgings	SA-182	F310MoLN	S31050	...	...	8	2
29	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	8	2
30	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	8	2
31	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	t > 0.250	8	2
32	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	t > 0.250	8	2
33	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	8	2
34	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	8	2
35	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	8	2
36	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	8	2
37	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	≤0.250, wall	8	2
38	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	≤0.250, wall	8	2
39	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	t ≤ 0.250	8	2
40	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	t ≤ 0.250	8	2
41	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	≤0.250, wall	8	2
42	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	≤0.250, wall	8	2
43	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	≤0.250, wall	8	2
44	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	≤0.250, wall	8	2
45	26Cr-4Ni-Mo	Plate	SA-240	329	S32900	...	...	10H	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	75	30	NP	NP	1500	NP	HA-2	G5, G12, G24, T6
2	75	30	NP	NP	1500	NP	HA-2	G12, G24, T7
3	75	30	1500	NP	1500	NP	HA-2	G5, T6
4	75	30	1500	NP	1500	NP	HA-2	T7
5	75	30	1500	NP	1500	NP	HA-2	G3, G5, G24, T6
6	75	30	1500	NP	1500	NP	HA-2	G3, G24, T7
7	75	30	1500	NP	1500	NP	HA-2	G5, T6
8	75	30	1500	NP	1500	NP	HA-2	T7
9	75	30	NP	NP	1500	650	HA-2	G5, G12, T5
10	75	30	NP	NP	1500	650	HA-2	G12, T6
11	75	30	NP	NP	1500	650	HA-2	G5, G12, T5
12	75	30	NP	NP	1500	650	HA-2	G12, T6
13	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
14	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
15	75	30	NP	800	1500	650	HA-2	G5, G12, T5, W12, W14
16	75	30	NP	NP	1500	650	HA-2	G12, T6
17	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
18	75	30	NP	NP	1500	650	HA-2	G12, G14, G24, T6
19	75	30	NP	NP	1000	650	HA-2	G5, G12, G22, T5
20	75	30	NP	NP	1000	650	HA-2	G12, G22, T6
21	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
22	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
23	75	30	NP	NP	1500	650	HA-2	G5, G12, G24, T5
24	75	30	NP	NP	1500	650	HA-2	G12, G24, T6
25	95	43	1350	NP	NP	NP	HA-2	G5, G12, S4, T8
26	95	43	1350	NP	NP	NP	HA-2	G12, S4, T9
27	78	37	NP	NP	600	600	HA-2	G5
28	78	37	NP	NP	600	600	HA-2	...
29	78	37	NP	NP	900	650	HA-2	G5
30	78	37	NP	NP	900	650	HA-2	...
31	78	37	NP	NP	600	600	HA-2	G5
32	78	37	NP	NP	600	600	HA-2	...
33	78	37	NP	NP	900	650	HA-2	G5, G24
34	78	37	NP	NP	900	650	HA-2	G24
35	78	37	NP	NP	900	650	HA-2	G5, G24
36	78	37	NP	NP	900	650	HA-2	G24
37	84	39	NP	NP	900	650	HA-2	G5
38	84	39	NP	NP	900	650	HA-2	...
39	84	39	NP	NP	600	600	HA-2	G5
40	84	39	NP	NP	600	600	HA-2	...
41	84	39	NP	NP	900	650	HA-2	G5, G24
42	84	39	NP	NP	900	650	HA-2	G24
43	84	39	NP	NP	900	650	HA-2	G5, G24
44	84	39	NP	NP	900	650	HA-2	G24
45	90	70	NP	NP	500	500	HA-5	G19

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
2	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
3	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
4	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
5	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
6	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
7	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
8	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
9	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
10	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
11	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
12	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
13	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
14	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
15	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
16	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
17	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
18	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
19	20.0	...	20.0	...	20.0	19.9	19.3	18.5	18.2	17.9	17.7	17.4	17.2	16.9
20	20.0	...	17.6	...	16.1	15.1	14.3	13.7	13.5	13.3	13.1	12.9	12.7	12.5
21	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
22	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
23	17.0	...	17.0	...	17.0	16.9	16.4	15.7	15.5	15.2	15.0	14.8	14.6	14.4
24	17.0	...	15.0	...	13.7	12.8	12.1	11.7	11.5	11.3	11.1	11.0	10.8	10.7
25	27.1	...	26.9	...	25.4	24.6	24.2	24.0	23.9	23.8	23.7	23.6	23.4	23.1
26	27.1	...	24.0	...	21.7	20.2	19.2	18.5	18.3	18.1	17.8	17.6	17.4	17.1
27	22.3	...	22.0	...	20.8	20.0	19.5	19.0	...	...	...	...	...	...
28	22.3	...	21.0	...	19.1	17.8	16.8	15.9	...	...	...	...	...	...
29	22.3	...	22.0	...	20.8	20.0	19.5	19.0	18.8	18.7	18.5	18.4	18.2	17.9
30	22.3	...	21.0	...	19.1	17.8	16.8	15.9	15.5	15.1	14.8	14.4	14.0	13.7
31	22.3	...	22.0	...	20.8	20.0	19.5	19.0	...	...	...	...	...	...
32	22.3	...	21.0	...	19.1	17.8	16.8	15.9	...	...	...	...	...	...
33	18.9	...	18.7	...	17.7	17.0	16.5	16.2	16.0	15.9	15.8	15.6	15.5	15.2
34	18.9	...	17.8	...	16.2	15.1	14.3	13.5	13.2	12.9	12.5	12.2	11.9	11.7
35	18.9	...	18.7	...	17.7	17.0	16.5	16.2	16.0	15.9	15.8	15.6	15.5	15.2
36	18.9	...	17.8	...	16.2	15.1	14.3	13.5	13.2	12.9	12.5	12.2	11.9	11.7
37	24.0	...	23.7	...	22.4	21.6	21.0	20.5	20.3	20.1	20.0	19.8	19.6	19.3
38	24.0	...	22.1	...	20.1	18.7	17.7	16.8	16.4	16.0	15.6	15.2	14.8	14.5
39	24.0	...	23.7	...	22.4	21.6	21.0	20.5	...	...	...	...	...	...
40	24.0	...	22.1	...	20.1	18.7	17.7	16.8	...	...	...	...	...	...
41	20.4	...	20.2	...	19.1	18.3	17.8	17.4	17.3	17.1	17.0	16.8	16.6	16.4
42	20.4	...	18.8	...	17.1	15.9	15.0	14.3	13.9	13.6	13.2	12.9	12.6	12.3
43	20.4	...	20.2	...	19.1	18.3	17.8	17.4	17.3	17.1	17.0	16.8	16.6	16.4
44	20.4	...	18.8	...	17.1	15.9	15.0	14.3	13.9	13.6	13.2	12.9	12.6	12.3
45	25.7	...	25.7	...	24.8	24.3	24.3	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	14.2	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
2	10.5	10.3	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
3	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
4	12.3	12.1	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
5	14.2	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
6	10.5	10.3	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64	...	...	...
7	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
8	12.3	12.1	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75	...	...	...
9	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
10	12.3	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
11	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
12	12.3	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
13	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
14	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
15	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
16	12.3	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20	...	...	...
17	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
18	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
19	15.9	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
20	12.3	9.9	...	...	...	...	...	...	...	...	...	...	...	...	...
21	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
22	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
23	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
24	10.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17	...	...	...
25	22.8	22.4	22.0	18.4	13.6	10.1	7.6	5.7	4.3	...	...	...	...	...	...
26	16.9	16.6	16.3	16.1	13.6	10.1	7.6	5.7	4.3	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	26Cr-4Ni-Mo	Wld. tube	SA-789	...	S32900	...	...	10H	1
2	26Cr-4Ni-Mo	Smls. tube	SA-789	...	S32900	...	...	10H	1
3	26Cr-4Ni-Mo	Wld. pipe	SA-790	...	S32900	...	...	10H	1
4	26Cr-4Ni-Mo	Smls. pipe	SA-790	...	S32900	...	...	10H	1
5	26Cr-4Ni-Mo-N	Plate	SA-240	...	S32950	...	...	10H	1
6	26Cr-4Ni-Mo-N	Wld. tube	SA-789	...	S32950	...	...	10H	1
7	26Cr-4Ni-Mo-N	Smls. tube	SA-789	...	S32950	...	...	10H	1
8	26Cr-4Ni-Mo-N	Wld. pipe	SA-790	...	S32950	...	...	10H	1
9	26Cr-4Ni-Mo-N	Smls. pipe	SA-790	...	S32950	...	...	10H	1
(23) 10	27Cr-7.5Ni-4.5Mo-Co-N	Smls. tube	SA-789	...	S32707	...	...	10H	1
(23) 11	27Cr-7.5Ni-4.5Mo-Co-N	Smls. pipe	SA-790	...	S32707	...	...	10H	1
12	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	≥0.40	10H	1
13	29Cr-6.5Ni-2Mo-N	Bar	SA-479	...	S32906	...	...	10H	1
14	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	≥0.40	10H	1
15	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	≥0.40	10H	1
16	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	<0.40	10H	1
17	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	<0.40	10H	1
18	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	<0.40	10H	1

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
			I	III	VIII-1	XII		
1	90	70	NP	NP	500	500	HA-5	G19, G24
2	90	70	NP	NP	500	500	HA-5	G19
3	90	70	NP	NP	500	500	HA-5	G19, G24
4	90	70	NP	NP	500	500	HA-5	G19
5	100	70	NP	NP	600	600	HA-5	G19
6	100	70	NP	NP	600	600	HA-5	G19, G24
7	100	70	NP	NP	600	600	HA-5	G19
8	100	70	NP	NP	600	600	HA-5	G19, G24
9	100	70	NP	NP	600	600	HA-5	G19
10	133	101	NP	NP	500	NP	HA-5	G19
11	133	101	NP	NP	500	NP	HA-5	G19
12	109	80	NP	NP	600	600	HA-5	G19
13	109	80	NP	NP	600	600	HA-5	G19
14	109	80	NP	NP	600	600	HA-5	G19
15	109	80	NP	NP	600	600	HA-5	G19
16	116	94	NP	NP	600	600	HA-5	G19
17	116	94	NP	NP	600	600	HA-5	G19
18	116	94	NP	NP	600	600	HA-5	G19

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
No.	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	21.9	...	21.9	...	21.0	20.6	20.6	...	...	...	...	...	...	...
2	25.7	...	25.7	...	24.8	24.3	24.3	...	...	...	...	...	...	...
3	21.9	...	21.9	...	21.0	20.6	20.6	...	...	...	...	...	...	...
4	25.7	...	25.7	...	24.8	24.3	24.3	...	...	...	...	...	...	...
5	28.6	...	28.5	...	27.0	26.4	26.4	26.4	...	...	...	...	...	...
6	24.3	...	24.2	...	23.0	22.5	22.5	22.5	...	...	...	...	...	...
7	28.6	...	28.5	...	27.0	26.4	26.4	26.4	...	...	...	...	...	...
8	24.3	...	24.2	...	23.0	22.5	22.5	22.5	...	...	...	...	...	...
9	28.6	...	28.5	...	27.0	26.4	26.4	26.4	...	...	...	...	...	...
10	38.0	38.0	38.0	38.0	37.7	36.9	35.3	...	...	...	...	...	...	...
11	38.0	38.0	38.0	38.0	37.7	36.9	35.3	...	...	...	...	...	...	...
12	31.1	...	31.1	...	29.6	28.7	28.3	28.3	...	...	...	...	...	...
13	31.1	...	31.1	...	29.6	28.7	28.3	28.3	...	...	...	...	...	...
14	31.1	...	31.1	...	29.6	28.7	28.3	28.3	...	...	...	...	...	...
15	31.1	...	31.1	...	29.6	28.7	28.3	28.3	...	...	...	...	...	...
16	33.1	...	33.1	...	31.5	30.6	30.1	30.1	...	...	...	...	...	...
17	33.1	...	33.1	...	31.5	30.6	30.1	30.1	...	...	...	...	...	...
18	33.1	...	33.1	...	31.5	30.6	30.1	30.1	...	...	...	...	...	...

Table 1A (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Ferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...

NOTES TO TABLE 1A**GENERAL NOTES**

- (a) The following abbreviations are used: Norm. rld., Normalized rolled; NT, Normalized and tempered; QT, Quenched and tempered; Smls., Seamless; Sol. ann., Solution annealed; and Wld., Welded.
- (b) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (c) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (d) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.
- (e) Stress values for 100°F are applicable for colder temperatures when the toughness requirements of Section III, VIII, or XII are met.
- (f) An alternative typeface is used for stress values obtained from time-dependent properties (see Notes T1 through T12).
- (g) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-516/SA-516M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-516 Grade 70 shall be used when SA-516M Grade 485 is used in construction.

NOTES – GENERAL REQUIREMENTS

- G1 To these stress values a casting quality factor as specified in PG-25 of Section I; UG-24 of Section VIII, Division 1; or TM-190 of Section XII shall be applied.
- G2 These stress values include a joint efficiency factor of 0.60.
- G3 These stress values include a joint efficiency factor of 0.85.
- G4 For Section I applications, these stresses apply when used for boiler, water wall, superheater, and economizer tubes that are enclosed within a setting. A joint efficiency factor of 0.85 is included in values above 850°F.
- G5 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed 66²/₃% but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction. For Section III applications, Table Y-2 lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give allowable stress values that will result in lower levels of permanent strain.
- G6 Creep-fatigue, thermal ratcheting, and environmental effects are increasingly significant failure modes at temperatures in excess of 1500°F and shall be considered in the design.
- G7 For Section VIII applications, these stress values are based on expected minimum values of 45,000 psi tensile strength and yield strength of 20,000 psi resulting from loss of strength due to thermal treatment required for the glass coating operation. UG-85 does not apply.
- G8 These stress values are established from a consideration of strength only and will be satisfactory for average service. For bolted joints where freedom from leakage over a long period of time without retightening is required, lower stress values may be necessary as determined from the flexibility of the flange and bolts and corresponding relaxation properties.
- G9 For Section III applications, the use of these materials shall be limited to materials for tanks covered in Subsections NC and ND, component supports, and for nonpressure-retaining attachments (NC/ND-2190).
- G10 Upon prolonged exposure to temperatures above 800°F, the carbide phase of carbon steel may be converted to graphite. See Nonmandatory Appendix A, A-201 and A-202.
- G11 Upon prolonged exposure to temperatures above 875°F, the carbide phase of carbon-molybdenum steel may be converted to graphite. See Nonmandatory Appendix A, A-201 and A-202.
- G12 At temperatures above 1000°F, these stress values apply only when the carbon is 0.04% or higher on heat analysis.
- G13 These stress values at 1050°F and above shall be used only when the grain size is ASTM No. 6 or coarser.
- G14 These stress values shall be used when the grain size is not determined or is determined to be finer than ASTM No. 6.
- G15 For Section I applications, use is limited to stays as defined in PG-13 except as permitted by PG-11.
- G16 For Section III Class 3 applications, these S values do not include a casting quality factor. Statically and centrifugally cast products meeting the requirements of NC-2570 shall receive a casting quality factor of 1.00.
- G17 For Section III Class 3 applications, statically and centrifugally cast products meeting the requirements of NC-2571(a) and (b), and cast pipe fittings, pumps, and valves with inlet piping connections of 2 in. nominal pipe size and less, shall receive a casting quality factor of 1.00. Other casting quality factors shall be in accordance with the following:
 - (a) for visual examination, 0.80
 - (b) for magnetic particle examination, 0.85
 - (c) for liquid penetrant examination, 0.85
 - (d) for radiography, 1.00
 - (e) for ultrasonic examination, 1.00
 - (f) for magnetic particle or liquid penetrant plus ultrasonic examination or radiography, 1.00
- G18 See Table Y-1 for yield strength values as a function of thickness over this range. Allowable stresses are independent of yield strength in this thickness range.

NOTES TO TABLE 1A (CONT'D)**NOTES – GENERAL REQUIREMENTS (CONT'D)**

- G19 This steel may be expected to develop embrittlement after service at moderately elevated temperature; see Nonmandatory Appendix A, A-207 and A-208.
- G20 These stresses are based on weld metal properties.
- G21 For Section I, use is limited to PEB-5.3. See PG-5.5 for cautionary note.
- G22 For Section I applications, use of external pressure charts for material in the form of bar stock is permitted for stiffening rings only.
- G23 For temperatures above the maximum temperature shown on the external pressure chart for this material, Fig. CS-2 may be used for the design using this material.
- G24 A factor of 0.85 has been applied in arriving at the maximum allowable stress values in tension for this material. Divide tabulated values by 0.85 for maximum allowable longitudinal tensile stress.
- G25 For Section III applications, for both Class 2 and Class 3, the completed vessel after final heat treatment shall be examined by the ultrasonic method in accordance with NB-2542 except that angle beam examination in both the circumferential and the axial directions may be performed in lieu of the straight beam examination in the axial direction. The tensile strength shall not exceed 125,000 psi.
- G26 Material that conforms to Class 10, 11, or 12 is not permitted.
- G27 Material that conforms to Class 11 or 12 is not permitted.
- G28 Supplementary Requirement S15 of SA-781, Alternate Mechanical Test Coupons and Specimen Locations for Castings, is mandatory.
- G29 For Section III applications, impact testing in accordance with the requirements of NC-2300 is required for Class 2 components and in accordance with ND-2300 for Class 3 components.
- G30 These stresses apply to all product forms (C, H, and P) as defined in SA/EN 10028-7.

NOTES – HEAT TREATMENT REQUIREMENTS

- H1 For temperatures above 1000°F, these stress values may be used only if the material is heat treated by heating to the minimum temperature specified in the material specification, but not lower than 1900°F, and quenching in water or rapidly cooling by other means.
- H2 For temperatures above 1000°F, these stress values may be used only if the material is heat treated by heating to a minimum temperature of 2000°F, and quenching in water or rapidly cooling by other means.
- H3 Quenched and tempered at 1200°F.
- H4 Solution treated and quenched.
- H5 For Section III applications, if heat treatment is performed after forming or fabrication, it shall be performed at 1500°F to 1850°F for a period of time not to exceed 10 min at temperature, followed by rapid cooling.
- H6 Material shall be solution annealed at 2010°F to 2140°F, followed by a rapid cooling in water or air.

NOTES – SIZE REQUIREMENTS

- S1 For Section I applications, stress values at temperatures of 850°F and above are permissible but, except for tubular products 3 in. O.D. or less enclosed within the boiler setting, use of these materials at these temperatures is not current practice.
- S2 For Section I applications, stress values at temperatures of 900°F and above are permissible but, except for tubular products 3 in. O.D. or less enclosed within the boiler setting, use of these materials at these temperatures is not current practice.
- S3 For Section I applications, stress values at temperatures of 1000°F and above are permissible but, except for tubular products 3 in. O.D. or less enclosed within the boiler setting, use of these materials at these temperatures is not current practice.
- S4 For Section I applications, stress values at temperatures of 1150°F and above are permissible but, except for tubular products 3 in. O.D. or less enclosed within the boiler setting, use of these materials at these temperatures is not current practice.
- S5 Material that conforms to Class 10, 11, or 12 is not permitted when the nominal thickness of the material exceeds $\frac{3}{4}$ in.
- S6 Material that conforms to Class 10, 11, or 12 is not permitted when the nominal thickness of the material exceeds $1\frac{1}{4}$ in.
- S7 The maximum thickness of unheat-treated forgings shall not exceed $3\frac{3}{4}$ in. The maximum thickness as-heat-treated may be 4 in.
- S8 The maximum section thickness shall not exceed 3 in. for double-normalized-and-tempered forgings, or 5 in. for quenched-and-tempered forgings.
- S9 Both NPS 8 and larger, and schedule 140 and heavier.
- S10 The maximum pipe size shall be NPS 4 and the maximum thickness in any pipe size shall be schedule 80.
- S11 Either NPS 8 and larger and less than schedule 140 wall, or less than NPS 8 and all wall thicknesses.

NOTES – TIME-DEPENDENT PROPERTIES [See General Note (f)]

- T1 Allowable stresses for temperatures of 700°F and above are values obtained from time-dependent properties.
- T2 Allowable stresses for temperatures of 750°F and above are values obtained from time-dependent properties.
- T3 Allowable stresses for temperatures of 850°F and above are values obtained from time-dependent properties.
- T4 Allowable stresses for temperatures of 900°F and above are values obtained from time-dependent properties.
- T5 Allowable stresses for temperatures of 950°F and above are values obtained from time-dependent properties.
- T6 Allowable stresses for temperatures of 1000°F and above are values obtained from time-dependent properties.
- T7 Allowable stresses for temperatures of 1050°F and above are values obtained from time-dependent properties.
- T8 Allowable stresses for temperatures of 1100°F and above are values obtained from time-dependent properties.
- T9 Allowable stresses for temperatures of 1150°F and above are values obtained from time-dependent properties.
- T10 Allowable stresses for temperatures of 800°F and above are values obtained from time-dependent properties.
- T11 Allowable stresses for temperatures of 650°F and above are values obtained from time-dependent properties.
- T12 Allowable stresses for temperatures of 1200°F and above are values obtained from time-dependent properties.

NOTES – WELDING REQUIREMENTS

- W1 Not for welded construction.
- W2 Not for welded construction in Section III.

NOTES TO TABLE 1A (CONT'D)**NOTES – WELDING REQUIREMENTS (CONT'D)**

- W3 Welded.
- W4 Nonwelded, or welded if the tensile strength of the Section IX reduced section tension test is not less than 100 ksi.
- W5 Welded, with the tensile strength of the Section IX reduced tension test less than 100 ksi but not less than 95 ksi.
- W6 This material may be welded by the resistance technique.
- W7 In welded construction for temperatures above 850°F, the weld metal shall have a carbon content of greater than 0.05%.
- W8 Welding and oxygen or other thermal cutting processes are not permitted when carbon content exceeds 0.35% by heat analysis.
- W9 For Section I applications, for pressure retaining welds in 2¼Cr-1Mo materials, other than circumferential butt welds less than or equal to 3½ in. in outside diameter, when the design metal temperatures exceed 850°F, the weld metal shall have a carbon content greater than 0.05%.
- W10 For Section III applications, material that conforms to Class 10, 13, 20, 23, 30, 33, 40, 43, 50, or 53 is not permitted for Class 2 and Class 3 construction when a weld efficiency factor of 1.00 is used in accordance with Note W12.
- W11 For Section VIII applications, Section IX, QW-250 Variables QW-404.12, QW-406.3, QW-407.2, and QW-409.1 shall also apply to this material. These variables shall be applied in accordance with the rules for welding of Part UF.
- W12 These *S* values do not include a longitudinal weld efficiency factor. For Section III applications, for materials welded without filler metal, ultrasonic examination, radiographic examination, or eddy current examination, in accordance with NC-2550, shall provide a longitudinal weld efficiency factor of 1.00. Materials welded with filler metal meeting the requirements of NC-2560 shall receive a longitudinal weld efficiency factor of 1.00. Other longitudinal weld efficiency factors shall be in accordance with the following:
- (a) for single butt weld, with filler metal, 0.80
 - (b) for single or double butt weld, without filler metal, 0.85
 - (c) for double butt weld, with filler metal, 0.90
 - (d) for single or double butt weld, with radiography, 1.00
- W13 For Section I applications, electric resistance and autogenous welded tubing may be used with these stresses, provided the following additional restrictions and requirements are met:
- (a) The tubing shall be used for boiler, waterwall, superheater, and economizer tubes that are enclosed within the setting.
 - (b) The maximum outside diameter shall be 3½ in.
 - (c) The weld seam of each tube shall be subjected to an angle beam ultrasonic inspection per SA-450/SA-1016.
 - (d) A complete volumetric inspection of the entire length of each tube shall be performed in accordance with SA-450/SA-1016.
 - (e) Material test reports shall be supplied.
- W14 These *S* values do not include a weld factor. For Section VIII, Division 1 and Section XII applications using welds made without filler metal, the tabulated tensile stress values shall be multiplied by 0.85. For welds made with filler metal, consult UW-12 for Section VIII, Division 1, or TW-130.4 for Section XII, as applicable.
- W15 The Nondestructive Electric Test requirements of SA-53 Type E pipe are required for all sizes. The pipe shall be additionally marked "NDE" and so noted on the material certification.

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Table 1B
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Plate, sheet	SB-209	...	Alclad 3003	O
2	...	Plate, sheet	SB-209	...	Alclad 3003	O
3	...	Plate, sheet	SB-209	...	Alclad 3003	H112
4	...	Plate, sheet	SB-209	...	Alclad 3003	H112
5	...	Plate, sheet	SB-209	...	Alclad 3003	H112
6	...	Plate, sheet	SB-209	...	Alclad 3003	H12
7	...	Plate, sheet	SB-209	...	Alclad 3003	H12
8	...	Plate, sheet	SB-209	...	Alclad 3003	H14
9	...	Plate, sheet	SB-209	...	Alclad 3003	H14
10	...	Drawn smls. tube	SB-210	...	Alclad 3003	O
11	...	Drawn smls. tube	SB-210	...	Alclad 3003	H113
12	...	Drawn smls. tube	SB-210	...	Alclad 3003	H14
13	...	Drawn smls. tube	SB-210	...	Alclad 3003	H18
14	...	Cond. & heat exch. tubes	SB-234	...	Alclad 3003	H14
15	...	Cond. & heat exch. tubes	SB-234	...	Alclad 3003	H25
16	...	Smls. extr. tube	SB-241	...	Alclad 3003	O
17	...	Smls. extr. tube	SB-241	...	Alclad 3003	H112
18	...	Plate, sheet	SB-209	...	Alclad 3004	O
19	...	Plate, sheet	SB-209	...	Alclad 3004	O
20	...	Plate, sheet	SB-209	...	Alclad 3004	H112
21	...	Plate, sheet	SB-209	...	Alclad 3004	H112
22	...	Plate, sheet	SB-209	...	Alclad 3004	H32
23	...	Plate, sheet	SB-209	...	Alclad 3004	H32
24	...	Plate, sheet	SB-209	...	Alclad 3004	H34
25	...	Plate, sheet	SB-209	...	Alclad 3004	H34
26	...	Plate, sheet	SB-209	...	Alclad 6061	T4
27	...	Plate, sheet	SB-209	...	Alclad 6061	T451
28	...	Plate, sheet	SB-209	...	Alclad 6061	T451
29	...	Plate, sheet	SB-209	...	Alclad 6061	T4 wld.
30	...	Plate, sheet	SB-209	...	Alclad 6061	T451 wld.
31	...	Plate, sheet	SB-209	...	Alclad 6061	T6
32	...	Plate, sheet	SB-209	...	Alclad 6061	T651
33	...	Plate, sheet	SB-209	...	Alclad 6061	T651
34	...	Plate, sheet	SB-209	...	Alclad 6061	T651
35	...	Plate, sheet	SB-209	...	Alclad 6061	T6 wld.
36	...	Plate, sheet	SB-209	...	Alclad 6061	T651 wld.
37	...	Castings	SB-26	...	A02040	T4
38	...	Castings	SB-108	...	A02040	T4
39	...	Castings	SB-26	...	A03560	T71
40	...	Castings	SB-26	...	A03560	T6
41	...	Castings	SB-108	...	A03560	T6
42	...	Castings	SB/EN 1706	...	AC-42000-S	T6
43	...	Castings	SB-26	...	A24430	F
44	...	Plate, sheet	SB-209	...	A91060	O
45	...	Plate, sheet	SB-209	...	A91060	H112

Table 1B
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	0.006-0.499	21	13	4.5	NP	250 (Cl. 3 only)	400	400	NFA-7	G16
2	0.500-3.000	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-7	G25
3	0.250-0.499	21	16	9	NP	300 (Cl. 3 only)	400	400	NFA-7	G16, W3
4	0.500-2.000	21	15	6	NP	200 (Cl. 3 only)	400	400	NFA-7	G26, W3
5	2.001-3.000	21	14.5	6	NP	200 (Cl. 3 only)	400	400	NFA-7	G26, W3
6	0.017-0.499	21	16	11	NP	300 (Cl. 3 only)	400	400	NFA-7	G16, W3
7	0.500-2.000	21	17	12	NP	300 (Cl. 3 only)	400	400	NFA-7	G25, W3
8	0.009-0.499	21	19	16	NP	250 (Cl. 3 only)	400	400	NFA-7	G16, W3
9	0.500-1.000	21	20	17	NP	250 (Cl. 3 only)	400	400	NFA-7	G25, W3
10	0.010-0.500	21	13	4.5	NP	250 (Cl. 3 only)	400	400	NFA-7	G16
11	0.050-0.500	21	13	4.5	NP	250 (Cl. 3 only)	400	400	NFA-7	G16, W3
12	0.010-0.500	21	19	16	NP	250 (Cl. 3 only)	400	400	NFA-1	G16, W3
13	0.010-0.500	21	26	23	NP	250 (Cl. 3 only)	400	400	NFA-1	G16, W3
14	0.010-0.200	21	19	16	NP	250 (Cl. 3 only)	400	400	NFA-1	G16, W4
15	0.010-0.200	21	21	18	NP	250 (Cl. 3 only)	400	400	NFA-1	G16, W4
16	...	21	13	4.5	NP	250 (Cl. 3 only)	400	400	NFA-7	G16
17	...	21	13	4.5	NP	250 (Cl. 3 only)	400	400	NFA-7	G16, W3
18	0.006-0.499	22	21	8	NP	300 (Cl. 3 only)	400	400	NFA-7	G16
19	0.500-3.000	22	22	8.5	NP	300 (Cl. 3 only)	400	400	NFA-7	G25
20	0.250-0.499	22	22	8.5	NP	300 (Cl. 3 only)	400	400	NFA-7	G16, W3
21	0.500-3.000	22	23	9	NP	300 (Cl. 3 only)	400	400	NFA-7	G25, W3
22	0.017-0.499	22	27	20	NP	250 (Cl. 3 only)	400	400	NFA-7	G16, W3
23	0.500-2.000	22	28	21	NP	250 (Cl. 3 only)	400	400	NFA-7	G25, W3
24	0.009-0.499	22	31	24	NP	250 (Cl. 3 only)	400	400	NFA-7	G16, W3
25	0.500-1.000	22	32	25	NP	250 (Cl. 3 only)	400	400	NFA-7	G25, W3
26	0.010-0.249	23	27	14	NP	400 (Cl. 3 only)	400	400	NFA-12	G16, G24, W4
27	0.250-0.499	23	27	14	NP	400 (Cl. 3 only)	400	400	NFA-12	G16, G24, W4
28	0.500-3.000	23	30	16	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, G25, W4
29	0.010-0.249	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, W7
30	0.250-3.000	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, W7
31	0.010-0.249	23	38	32	NP	400 (Cl. 3 only)	400	400	NFA-12	G16, G24, W4
32	0.250-0.499	23	38	32	NP	400 (Cl. 3 only)	400	400	NFA-12	G16, G24, W4
33	0.500-4.000	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, G25, W4
34	4.001-5.000	23	40	35	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, G26, W4
35	0.010-0.249	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, W7
36	0.250-5.000	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, W7
37	≤2.000	...	45	28	NP	NP	150	150	NFA-12	G15, W4
38	≤2.000	...	48	29	NP	NP	150	150	NFA-12	G15, W4
39	...	...	25	18	NP	350 (Cl. 3 only)	400	400	NFA-1	G15, W4
40	...	...	30	20	NP	250 (Cl. 3 only)	250	250	NFA-12	G15, W4
41	...	...	33	22	NP	NP	250	250	NFA-12	G15, W4
42	...	...	32	26	NP	NP	250	NP	NFA-12	G15, W4
43	...	...	17	6	NP	400 (Cl. 3 only)	400	400	NFA-1	G15, W4
44	0.006-3.000	21	8	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	T3
45	0.250-0.499	21	11	7	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W3

Table 1B
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	3.0	2.9	2.8	2.7	2.2	1.6	1.3	...	...	...	...	...	...	...	...	...	...	...
2	3.3	3.2	3.1	3.0	2.2	1.6	1.3	...	...	...	...	...	...	...	...	...	...	...
3	4.6	4.5	4.2	3.9	3.3	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
4	4.0	3.9	3.8	3.6	2.2	1.6	1.3	...	...	...	...	...	...	...	...	...	...	...
5	4.0	3.9	3.8	3.5	2.2	1.6	1.3	...	...	...	...	...	...	...	...	...	...	...
6	4.6	4.6	4.5	4.2	3.3	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
7	4.9	4.9	4.8	4.5	3.3	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
8	5.4	5.4	5.4	5.2	3.9	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
9	5.7	5.7	5.7	5.5	3.9	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
10	3.0	2.9	2.8	2.7	2.2	1.6	1.3	...	...	...	...	...	...	...	...	...	...	...
11	3.0	2.9	2.8	2.7	2.2	1.6	1.3	...	...	...	...	...	...	...	...	...	...	...
12	5.4	5.4	5.4	5.2	3.9	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
13	7.4	7.4	7.3	6.9	4.8	3.2	2.3	...	...	...	...	...	...	...	...	...	...	...
14	5.4	5.4	5.4	5.2	3.9	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
15	6.0	6.0	6.0	5.7	3.9	2.7	2.1	...	...	...	...	...	...	...	...	...	...	...
16	3.0	2.9	2.8	2.7	2.2	1.6	1.2	...	...	...	...	...	...	...	...	...	...	...
17	3.0	2.9	2.8	2.7	2.2	1.6	1.2	...	...	...	...	...	...	...	...	...	...	...
18	5.3	5.3	5.3	5.3	4.5	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
19	5.7	5.7	5.7	5.7	4.5	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
20	5.7	5.7	5.7	5.7	4.6	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
21	6.0	6.0	6.0	6.0	4.6	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
22	7.7	7.7	7.7	7.7	5.2	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
23	8.0	8.0	8.0	8.0	5.2	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
24	8.9	8.9	8.9	8.9	5.2	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
25	9.1	9.1	9.1	9.1	5.2	3.4	2.1	...	...	...	...	...	...	...	...	...	...	...
26	7.7	7.7	7.7	7.6	6.2	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
27	7.7	7.7	7.7	7.6	6.2	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
28	8.6	8.6	8.6	8.5	6.2	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
29	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
30	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
31	10.9	10.9	10.9	10.6	7.6	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
32	10.9	10.9	10.9	10.6	7.6	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
33	12.0	12.0	12.0	11.7	7.6	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
34	11.4	11.4	11.4	11.1	7.4	5.7	4.0	...	...	...	...	...	...	...	...	...	...	...
35	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
36	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
37	8.4	7.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	10.3	8.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	7.2	7.2	7.2	6.3	5.4	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
40	8.6	8.6	8.6	6.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	9.5	9.3	8.5	6.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	9.1	9.1	9.1	9.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	4.0	4.0	4.0	3.8	3.5	3.1	2.8	...	...	...	...	...	...	...	...	...	...	...
44	1.7	1.7	1.6	1.4	1.3	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
45	3.1	3.0	2.7	2.4	1.8	1.6	1.0	...	...	...	...	...	...	...	...	...	...	...

Table 1B
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Plate, sheet	SB-209	...	A91060	H112
2	...	Plate, sheet	SB-209	...	A91060	H112
3	...	Plate, sheet	SB-209	...	A91060	H12
4	...	Plate, sheet	SB-209	...	A91060	H14
5	...	Drawn smls. tube	SB-210	...	A91060	O
6	...	Drawn smls. tube	SB-210	...	A91060	H14
7	...	Drawn smls. tube	SB-210	...	A91060	H113
8	...	Bar, rod, shapes	SB-221	...	A91060	O
9	...	Bar, rod, shapes	SB-221	...	A91060	H112
10	...	Cond. & heat exch. tubes	SB-234	...	A91060	H14
11	...	Smls. extr. tube	SB-241	...	A91060	O
12	...	Smls. extr. tube	SB-241	...	A91060	H112
13	...	Plate, sheet	SB-209	...	A91100	O
14	...	Plate, sheet	SB-209	...	A91100	H112
15	...	Plate, sheet	SB-209	...	A91100	H112
16	...	Plate, sheet	SB-209	...	A91100	H112
17	...	Plate, sheet	SB-209	...	A91100	H12
18	...	Plate, sheet	SB-209	...	A91100	H14
19	...	Bar, rod, shapes	SB-221	...	A91100	O
20	...	Bar, rod, shapes	SB-221	...	A91100	H112
21	...	Smls. extr. tube	SB-241	...	A91100	O
22	...	Smls. extr. tube	SB-241	...	A91100	H112
23	...	Die forgings	SB-247	...	A92014	T4
24	...	Die forgings	SB-247	...	A92014	T6
25	...	Die forgings	SB-247	...	A92014	T6
26	...	Bar, rod, wire	SB-211	...	A92024	T4
27	...	Bar, rod, wire	SB-211	...	A92024	T4
28	...	Bar, rod, wire	SB-211	...	A92024	T4
29	...	Bar, rod, wire	SB-211	...	A92024	T4
30	...	Bar, rod, shapes	SB-221	...	A92024	T3
31	...	Bar, rod, shapes	SB-221	...	A92024	T3
32	...	Bar, rod, shapes	SB-221	...	A92024	T3
33	...	Bar, rod, shapes	SB-221	...	A92024	T3
34	...	Plate, sheet	SB-209	...	A93003	O
35	...	Plate, sheet	SB-209	...	A93003	H112
36	...	Plate, sheet	SB-209	...	A93003	H112
37	...	Plate, sheet	SB-209	...	A93003	H112
38	...	Plate, sheet	SB-209	...	A93003	H12
39	...	Plate, sheet	SB-209	...	A93003	H14
40	...	Drawn smls. tube	SB-210	...	A93003	O
41	...	Drawn smls. tube	SB-210	...	A93003	H113
42	...	Drawn smls. tube	SB-210	...	A93003	H12
43	...	Drawn smls. tube	SB-210	...	A93003	H14
44	...	Drawn smls. tube	SB-210	...	A93003	H18
45	...	Bar, rod, shapes	SB-221	...	A93003	O

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	0.500-1.000	21	10	5	NP	300 (Cl. 3 only)	400	400	NFA-7	T4, W3
2	1.001-3.000	21	9	4	NP	250 (Cl. 3 only)	400	400	NFA-7	T3, W3
3	0.017-2.000	21	11	9	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W3
4	0.009-1.000	21	12	10	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W3
5	0.018-0.500	21	8.5	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	T3
6	0.018-0.500	...	12	10	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W3
7	0.018-0.500	21	8.5	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W3
8	...	21	8.5	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	G13, T3
9	...	21	8.5	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	G13, T3, W3
10	0.010-0.200	21	12	10	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W4
11	...	21	8.5	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	T3
12	...	21	8.5	2.5	NP	300 (Cl. 3 only)	400	400	NFA-7	T3, W3
13	0.006-3.000	21	11	3.5	NP	250 (Cl. 3 only)	400	400	NFA-7	T4
14	0.250-0.499	21	13	7	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
15	0.500-2.000	21	12	5	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
16	2.001-3.000	21	11.5	4	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
17	0.017-2.000	21	14	11	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
18	0.009-1.000	21	16	14	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
19	...	21	11	3	NP	250 (Cl. 3 only)	400	400	NFA-7	T4
20	...	21	11	3	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
21	...	21	11	3	NP	250 (Cl. 3 only)	400	400	NFA-7	T4
22	...	21	11	3	NP	250 (Cl. 3 only)	400	400	NFA-7	T4, W3
23	≤4.000	...	55	30	NP	400 (Cl. 3 only)	400	400	NFA-6	T3, W4
24	≤2.000	...	65	56	NP	400 (Cl. 3 only)	400	400	NFA-6	T2, W4
25	2.001-4.000	...	63	54	NP	400 (Cl. 3 only)	400	400	NFA-6	T2, W4
26	0.125-0.499	...	62	45	NP	400 (Cl. 3 only)	400	400	NFA-6	T2, W4
27	0.500-4.500	...	62	42	NP	400 (Cl. 3 only)	400	400	NFA-6	T2, W4
28	4.501-6.500	...	62	40	NP	400 (Cl. 3 only)	400	400	NFA-6	T2, W4
29	6.501-8.000	...	58	38	NP	400 (Cl. 3 only)	400	400	NFA-6	T2, W4
30	≤0.249	...	57	42	NP	400 (Cl. 3 only)	400	400	NFA-6	G24, T2, W4
31	0.250-0.749	...	60	44	NP	400 (Cl. 3 only)	400	400	NFA-6	G24, T2, W4
32	0.750-1.499	...	65	46	NP	400 (Cl. 3 only)	400	400	NFA-6	G24, T2, W4
33	≥1.500	...	68	48	NP	400 (Cl. 3 only)	400	400	NFA-6	G24, T2, W4
34	0.006-3.000	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3
35	0.250-0.499	21	17	10	NP	300 (Cl. 3 only)	400	400	NFA-1	T4, W3
36	0.500-2.000	21	15	6	NP	200 (Cl. 3 only)	400	400	NFA-1	T3, W3
37	2.001-3.000	21	14.5	6	NP	200 (Cl. 3 only)	400	400	NFA-1	T3, W3
38	0.017-2.000	21	17	12	NP	300 (Cl. 3 only)	400	400	NFA-1	T4, W3
39	0.009-1.000	21	20	17	NP	250 (Cl. 3 only)	400	400	NFA-2	T4, W3
40	0.010-0.500	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3
41	0.010-0.500	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3, W3
42	0.010-0.500	21	17	12	NP	300 (Cl. 3 only)	400	400	NFA-1	T4, W3
43	0.010-0.500	21	20	17	NP	250 (Cl. 3 only)	400	400	NFA-2	T4, W3
44	0.010-0.500	21	27	24	NP	250 (Cl. 3 only)	400	400	NFA-2	T4, W3
45	...	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	2.9	2.7	2.4	2.2	1.7	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
2	2.6	2.4	2.2	1.9	1.5	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
3	3.1	3.1	2.9	2.7	2.1	1.8	1.1	...	...	...	...	...	...	...	...	...	...	...
4	3.4	3.4	3.4	3.4	2.6	1.8	1.2	...	...	...	...	...	...	...	...	...	...	...
5	1.7	1.7	1.6	1.4	1.3	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
6	3.4	3.4	3.4	3.4	2.6	1.8	1.2	...	...	...	...	...	...	...	...	...	...	...
7	1.7	1.7	1.6	1.4	1.3	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
8	1.7	1.7	1.6	1.4	1.3	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
9	1.7	1.7	1.6	1.4	1.3	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
10	3.4	3.4	3.4	3.4	2.6	1.8	1.2	...	...	...	...	...	...	...	...	...	...	...
11	1.7	1.7	1.6	1.4	1.3	1.1	0.80	...	...	...	...	...	...	...	...	...	...	...
12	1.7	1.7	1.6	1.4	1.2	1.0	0.80	...	...	...	...	...	...	...	...	...	...	...
13	2.3	2.3	2.3	2.3	1.8	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
14	3.7	3.7	3.5	3.1	2.4	1.7	1.0	...	...	...	...	...	...	...	...	...	...	...
15	3.3	3.3	3.2	2.9	2.2	1.7	1.0	...	...	...	...	...	...	...	...	...	...	...
16	2.7	2.7	2.6	2.5	1.8	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
17	4.0	4.0	4.0	3.6	2.8	2.0	1.2	...	...	...	...	...	...	...	...	...	...	...
18	4.6	4.6	4.6	4.2	2.8	2.0	1.2	...	...	...	...	...	...	...	...	...	...	...
19	2.0	2.0	2.0	2.0	1.8	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
20	2.0	2.0	2.0	2.0	1.8	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
21	2.0	2.0	2.0	2.0	1.8	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
22	2.0	2.0	2.0	2.0	1.8	1.4	1.0	...	...	...	...	...	...	...	...	...	...	...
23	15.7	15.7	13.3	12.5	11.5	6.8	3.9	...	...	...	...	...	...	...	...	...	...	...
24	18.6	18.6	18.6	14.8	11.5	6.8	3.9	...	...	...	...	...	...	...	...	...	...	...
25	18.0	18.0	18.0	14.3	11.5	6.8	3.9	...	...	...	...	...	...	...	...	...	...	...
26	17.7	17.7	17.7	13.7	10.4	6.5	4.5	...	...	...	...	...	...	...	...	...	...	...
27	17.7	17.7	17.7	13.7	10.4	6.5	4.5	...	...	...	...	...	...	...	...	...	...	...
28	17.7	17.7	17.7	13.7	10.4	6.5	4.5	...	...	...	...	...	...	...	...	...	...	...
29	16.6	16.6	16.6	12.8	9.7	6.1	4.2	...	...	...	...	...	...	...	...	...	...	...
30	16.3	16.3	16.3	12.6	9.5	6.0	4.2	...	...	...	...	...	...	...	...	...	...	...
31	17.1	17.1	17.1	13.2	10.0	6.3	4.4	...	...	...	...	...	...	...	...	...	...	...
32	18.6	18.6	18.6	14.3	10.8	6.8	4.7	...	...	...	...	...	...	...	...	...	...	...
33	19.4	19.4	19.4	15.0	11.3	7.1	5.0	...	...	...	...	...	...	...	...	...	...	...
34	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
35	4.9	4.8	4.4	4.1	3.6	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
36	4.0	3.9	3.7	3.6	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
37	4.0	3.9	3.7	3.5	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
38	4.9	4.9	4.8	4.5	3.6	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
39	5.7	5.7	5.7	5.5	4.3	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
40	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
41	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
42	4.9	4.9	4.8	4.5	3.6	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
43	5.7	5.7	5.7	5.5	4.3	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
44	7.7	7.7	7.4	6.9	5.4	3.5	2.5	...	...	...	...	...	...	...	...	...	...	...
45	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Bar, rod, shapes	SB-221	...	A93003	H112
2	...	Cond. & heat exch. tubes	SB-234	...	A93003	H14
3	...	Cond. & heat exch. tubes	SB-234	...	A93003	H25
4	...	Smls. extr. tube	SB-241	...	A93003	O
5	...	Smls. extr. tube	SB-241	...	A93003	H112
6	...	Smls. pipe	SB-241	...	A93003	H112
7	...	Smls. pipe	SB-241	...	A93003	H18
8	...	Die forgings	SB-247	...	A93003	H112
9	...	Die forgings	SB-247	...	A93003	H112 wld.
10	...	Plate, sheet	SB-209	...	A93004	O
11	...	Plate, sheet	SB-209	...	A93004	H112
12	...	Plate, sheet	SB-209	...	A93004	H32
13	...	Plate, sheet	SB-209	...	A93004	H34
14	...	Plate, sheet	SB-209	...	A95052	O
15	...	Plate, sheet	SB-209	...	A95052	H112
16	...	Plate, sheet	SB-209	...	A95052	H112
17	...	Plate, sheet	SB-209	...	A95052	H32
18	...	Plate, sheet	SB-209	...	A95052	H34
19	...	Drawn smls. tube	SB-210	...	A95052	O
20	...	Drawn smls. tube	SB-210	...	A95052	H32
21	...	Drawn smls. tube	SB-210	...	A95052	H34
22	...	Cond. & heat exch. tubes	SB-234	...	A95052	H32
23	...	Cond. & heat exch. tubes	SB-234	...	A95052	H34
24	...	Smls. extr. tube	SB-241	...	A95052	O
25	...	Plate, sheet	SB-209	...	A95083	O
26	...	Plate, sheet	SB-209	...	A95083	O
27	...	Plate, sheet	SB-209	...	A95083	O
28	...	Plate, sheet	SB-209	...	A95083	O
29	...	Plate, sheet	SB-209	...	A95083	O
30	...	Plate, sheet	SB-209	...	A95083	H112
31	...	Plate, sheet	SB-209	...	A95083	H112
32	...	Plate, sheet	SB-209	...	A95083	H32
33	...	Plate, sheet	SB-209	...	A95083	H32
34	...	Bar, rod, shapes	SB-221	...	A95083	O
35	...	Bar, rod, shapes	SB-221	...	A95083	H111
36	...	Bar, rod, shapes	SB-221	...	A95083	H112
37	...	Smls. extr. tube	SB-241	...	A95083	O
38	...	Smls. extr. tube	SB-241	...	A95083	H111
39	...	Smls. extr. tube	SB-241	...	A95083	H112
40	...	Die & hand forgings	SB-247	...	A95083	H111
41	...	Die & hand forgings	SB-247	...	A95083	H112
(23) 42	...	Die & hand forgings	SB-247	...	A95083	H111 wld.
(23) 43	...	Die & hand forgings	SB-247	...	A95083	H112 wld.
44	...	Plate, sheet	SB-928	...	A95083	H321
45	...	Plate, sheet	SB-928	...	A95083	H321

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3, W3
2	0.010-0.200	21	20	17	NP	250 (Cl. 3 only)	400	400	NFA-2	T4, W4
3	0.010-0.200	21	22	19	NP	250 (Cl. 3 only)	400	400	NFA-2	T4, W4
4	...	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3
5	...	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3, W3
6	≥1.000	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3, W4
7	<1.000	21	27	24	NP	250 (Cl. 3 only)	400	400	NFA-1	T4, W4
8	≤4.000	21	14	5	NP	250 (Cl. 3 only)	400	400	NFA-1	T3
9	≤4.000	21	14	...	NP	250 (Cl. 3 only)	400	400	NFA-1	T3, W7
10	0.006-3.000	22	22	8.5	NP	300 (Cl. 3 only)	400	400	NFA-3	...
11	0.250-3.000	22	23	9	NP	300 (Cl. 3 only)	400	400	NFA-3	W3
12	0.017-2.000	22	28	21	NP	250 (Cl. 3 only)	400	400	NFA-3	W3
13	0.009-1.000	22	32	25	NP	250 (Cl. 3 only)	400	400	NFA-4	W3
14	0.006-3.000	22	25	9.5	NP	250 (Cl. 3 only)	400	400	NFA-8	...
15	0.250-0.499	22	28	16	NP	250 (Cl. 3 only)	400	400	NFA-8	W3
16	0.500-3.000	22	25	9.5	NP	250 (Cl. 3 only)	400	400	NFA-8	W3
17	0.017-2.000	22	31	23	NP	200 (Cl. 3 only)	400	400	NFA-3	W3
18	0.009-1.000	22	34	26	NP	200 (Cl. 3 only)	400	400	NFA-4	W3
19	0.010-0.450	22	25	10	NP	300 (Cl. 3 only)	400	400	NFA-8	...
20	0.010-0.450	22	31	23	NP	200 (Cl. 3 only)	400	400	NFA-8	W4
21	0.010-0.450	22	34	26	NP	200 (Cl. 3 only)	400	400	NFA-8	W4
22	0.010-0.200	22	31	23	NP	200 (Cl. 3 only)	400	400	NFA-8	W4
23	0.010-0.200	22	34	26	NP	200 (Cl. 3 only)	400	400	NFA-8	W4
24	...	22	25	10	NP	250 (Cl. 3 only)	400	400	NFA-8	...
25	0.051-1.500	25	40	18	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
26	1.501-3.000	25	39	17	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
27	3.001-5.000	25	38	16	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
28	5.001-7.000	25	37	15	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
29	7.001-8.000	25	36	14	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
30	0.250-1.500	25	40	18	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
31	1.501-3.000	25	39	17	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
32	0.125-1.500	25	44	31	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
33	1.501-3.000	25	41	29	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
34	≤5.000	25	39	16	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
35	≤5.000	25	40	24	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
36	≤5.000	25	39	16	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
37	...	25	39	16	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19
38	...	25	40	24	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
39	...	25	39	16	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
40	≤4.000	25	39	20	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W4
41	≤4.000	25	39	16	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W4
42	≤4.000	25	38	...	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W7
43	≤4.000	25	38	...	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W7
44	0.125-1.500	25	44	31	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
45	1.501-3.000	25	41	29	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
2	5.7	5.7	5.7	5.5	4.3	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
3	6.3	6.3	6.3	6.1	4.3	3.0	2.4	...	...	...	...	...	...	...	...	...	...	...
4	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
5	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
6	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
7	7.7	7.7	7.4	6.9	5.4	3.5	2.5	...	...	...	...	...	...	...	...	...	...	...
8	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
9	3.3	3.3	3.3	3.2	2.4	1.8	1.4	...	...	...	...	...	...	...	...	...	...	...
10	5.7	5.7	5.7	5.5	5.0	3.8	2.4	...	...	...	...	...	...	...	...	...	...	...
11	6.0	6.0	6.0	6.0	5.1	3.8	2.4	...	...	...	...	...	...	...	...	...	...	...
12	8.0	8.0	8.0	8.0	5.8	3.8	2.4	...	...	...	...	...	...	...	...	...	...	...
13	9.1	9.1	9.1	9.1	5.8	3.8	2.4	...	...	...	...	...	...	...	...	...	...	...
14	6.3	6.3	6.3	6.3	5.6	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
15	8.0	8.0	8.0	8.0	6.2	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
16	6.3	6.3	6.3	6.3	6.0	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
17	8.9	8.9	8.9	8.9	6.2	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
18	9.7	9.7	9.7	9.7	6.2	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
19	6.7	6.7	6.7	6.7	5.6	4.1	2.3	...	...	...	...	...	...	...	...	...	...	...
20	8.9	8.9	8.9	8.9	6.1	4.1	2.3	...	...	...	...	...	...	...	...	...	...	...
21	9.7	9.7	9.7	9.7	6.1	4.1	2.3	...	...	...	...	...	...	...	...	...	...	...
22	8.9	8.9	8.9	8.9	6.2	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
23	9.7	9.7	9.7	9.7	6.2	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
24	6.7	6.7	6.7	6.7	5.6	4.1	2.3	...	...	...	...	...	...	...	...	...	...	...
25	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	11.1	11.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	11.1	11.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	12.6	12.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	11.1	11.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	12.6	12.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Plate, sheet	SB-209	...	A95086	O
2	...	Plate, sheet	SB-209	...	A95086	H112
3	...	Plate, sheet	SB-209	...	A95086	H112
4	...	Plate, sheet	SB-209	...	A95086	H112
5	...	Plate, sheet	SB-209	...	A95086	H112
6	...	Plate, sheet	SB-209	...	A95086	H32
7	...	Plate, sheet	SB-209	...	A95086	H34
8	...	Bar, rod, shapes	SB-221	...	A95086	H112
9	...	Smls. extr. tube	SB-241	...	A95086	O
10	...	Smls. extr. tube	SB-241	...	A95086	H111
11	...	Smls. extr. tube	SB-241	...	A95086	H112
12	...	Plate, sheet	SB-928	...	A95086	H116
13	...	Plate, sheet	SB-209	...	A95154	O
14	...	Plate, sheet	SB-209	...	A95154	H112
15	...	Plate, sheet	SB-209	...	A95154	H112
16	...	Plate, sheet	SB-209	...	A95154	H32
17	...	Plate, sheet	SB-209	...	A95154	H34
18	...	Drawn smls. tube	SB-210	...	A95154	O
19	...	Drawn smls. tube	SB-210	...	A95154	H34
20	...	Bar, rod, shapes	SB-221	...	A95154	O
21	...	Bar, rod, shapes	SB-221	...	A95154	H112
22	...	Plate, sheet	SB-209	...	A95254	O
23	...	Plate, sheet	SB-209	...	A95254	H112
24	...	Plate, sheet	SB-209	...	A95254	H112
25	...	Plate, sheet	SB-209	...	A95254	H32
26	...	Plate, sheet	SB-209	...	A95254	H34
27	...	Plate, sheet	SB-209	...	A95454	O
28	...	Plate, sheet	SB-209	...	A95454	H112
29	...	Plate, sheet	SB-209	...	A95454	H112
30	...	Plate, sheet	SB-209	...	A95454	H32
31	...	Plate, sheet	SB-209	...	A95454	H34
32	...	Bar, rod, shapes	SB-221	...	A95454	O
33	...	Bar, rod, shapes	SB-221	...	A95454	H111
34	...	Bar, rod, shapes	SB-221	...	A95454	H112
35	...	Cond. & heat exch. tubes	SB-234	...	A95454	H32
36	...	Cond. & heat exch. tubes	SB-234	...	A95454	H34
37	...	Smls. extr. tube	SB-241	...	A95454	O
38	...	Smls. extr. tube	SB-241	...	A95454	H111
39	...	Smls. extr. tube	SB-241	...	A95454	H112
40	...	Plate, sheet	SB-209	...	A95456	O
41	...	Plate, sheet	SB-209	...	A95456	O
42	...	Plate, sheet	SB-209	...	A95456	O
43	...	Plate, sheet	SB-209	...	A95456	O
44	...	Plate, sheet	SB-209	...	A95456	O
45	...	Plate, sheet	SB-209	...	A95456	H112

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	0.020-2.000	25	35	14	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19
2	0.188-0.499	25	36	18	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19, W3
3	0.500-1.000	25	35	16	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19, W3
4	1.001-2.000	25	35	14	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19, W3
5	2.001-3.000	25	34	14	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19
6	0.051-2.000	25	40	28	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
7	0.051-1.000	25	44	34	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
8	≤5.000	25	35	14	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19, W4
9	...	25	35	14	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19
10	...	25	36	21	NP	150 (Cl. 3 only)	150	150	NFA-9	G18, G19, W3
11	...	25	35	14	NP	150 (Cl. 3 only)	150	150	NFA-9	...
12	0.063-2.000	25	40	28	NP	NP	150	150	NFA-11	G18, G19, W3
13	0.020-3.000	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19
14	0.250-0.499	22	32	18	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
15	0.500-3.000	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19, W3
16	0.020-2.000	22	36	26	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
17	0.009-1.000	22	39	29	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
18	0.010-0.450	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19
19	0.010-0.450	22	39	29	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19, W3
20	...	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19
21	...	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19, W3
22	0.051-3.000	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19
23	0.250-0.499	22	32	18	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
24	0.500-3.000	22	30	11	NP	150 (Cl. 3 only)	150	150	NFA-5	G18, G19, W3
25	0.051-2.000	22	36	26	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
26	0.051-1.000	22	39	29	NP	150 (Cl. 3 only)	150	150	NFA-11	G18, G19, W3
27	0.020-3.000	22	31	12	NP	250 (Cl. 3 only)	400	400	NFA-6	T2
28	0.250-0.499	22	32	18	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
29	0.500-3.000	22	31	12	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
30	0.020-2.000	22	36	26	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
31	0.020-1.000	22	39	29	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
32	≤5.000	22	31	12	NP	250 (Cl. 3 only)	400	400	NFA-6	T2
33	≤5.000	22	33	19	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
34	≤5.000	22	31	12	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
35	0.010-0.200	22	36	26	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W4
36	0.010-0.200	22	39	29	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W4
37	...	22	31	12	NP	250 (Cl. 3 only)	400	400	NFA-6	T2
38	...	22	33	19	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
39	...	22	31	12	NP	250 (Cl. 3 only)	400	400	NFA-6	T2, W3
40	0.051-1.500	25	42	19	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
41	1.501-3.000	25	41	18	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
42	3.001-5.000	25	40	17	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
43	5.001-7.000	25	39	16	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
44	7.001-8.000	25	38	15	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
45	0.250-1.500	25	42	19	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	10.3	10.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	12.6	12.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	10.3	10.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	9.1	9.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	10.3	10.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	11.1	11.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	11.1	11.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	9.1	9.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	7.3	7.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	10.3	10.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	11.1	11.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	8.0	8.0	8.0	8.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
28	9.1	9.1	9.1	9.1	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
29	8.0	8.0	8.0	8.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
30	10.3	10.3	10.3	10.3	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
31	11.1	11.1	11.1	10.8	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
32	8.0	8.0	8.0	8.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
33	9.4	9.4	9.4	9.4	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
34	8.0	8.0	8.0	8.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
35	10.3	10.3	10.3	10.3	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
36	11.1	11.1	11.1	10.8	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
37	8.0	8.0	8.0	8.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
38	9.4	9.4	9.4	9.4	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
39	8.0	8.0	8.0	8.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...	...
40	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	11.3	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Plate, sheet	SB-209	...	A95456	H112
2	...	Plate, sheet	SB-209	...	A95456	H32
3	...	Plate, sheet	SB-209	...	A95456	H32
4	...	Plate, sheet	SB-209	...	A95456	H32
5	...	Bar, rod, shapes	SB-221	...	A95456	O
6	...	Bar, rod, shapes	SB-221	...	A95456	H111
7	...	Bar, rod, shapes	SB-221	...	A95456	H112
8	...	Smls. extr. tube	SB-241	...	A95456	O
9	...	Smls. extr. tube	SB-241	...	A95456	H111
10	...	Smls. extr. tube	SB-241	...	A95456	H112
11	...	Plate, sheet	SB-928	...	A95456	H321
12	...	Plate, sheet	SB-928	...	A95456	H321
13	...	Plate, sheet	SB-928	...	A95456	H321
14	...	Plate, sheet	SB-209	...	A95652	O
15	...	Plate, sheet	SB-209	...	A95652	H112
16	...	Plate, sheet	SB-209	...	A95652	H112
17	...	Plate, sheet	SB-209	...	A95652	H32
18	...	Plate, sheet	SB-209	...	A95652	H34
19	...	Plate, sheet	SB-209	...	A96061	T4
20	...	Plate, sheet	SB-209	...	A96061	T451
21	...	Plate, sheet	SB-209	...	A96061	T6
22	...	Plate, sheet	SB-209	...	A96061	T651
23	...	Plate, sheet	SB-209	...	A96061	T651
24	...	Plate, sheet	SB-209	...	A96061	T4 wld.
25	...	Plate, sheet	SB-209	...	A96061	T451 wld.
26	...	Plate, sheet	SB-209	...	A96061	T6 wld.
27	...	Plate, sheet	SB-209	...	A96061	T651 wld.
28	...	Drawn smls. tube	SB-210	...	A96061	T4
29	...	Drawn smls. tube	SB-210	...	A96061	T6
30	...	Drawn smls. tube	SB-210	...	A96061	T4 wld.
31	...	Drawn smls. tube	SB-210	...	A96061	T6 wld.
32	...	Bar, rod, wire	SB-211	...	A96061	T6
33	...	Bar, rod, wire	SB-211	...	A96061	T651
34	...	Bar, rod, wire	SB-211	...	A96061	T6 wld.
35	...	Bar, rod, wire	SB-211	...	A96061	T651 wld.
36	...	Bar, rod, shapes	SB-221	...	A96061	T4
37	...	Bar, rod, shapes	SB-221	...	A96061	T6
38	...	Bar, rod, shapes	SB-221	...	A96061	T4 wld.
39	...	Bar, rod, shapes	SB-221	...	A96061	T6 wld.
40	...	Cond. & heat exch. tubes	SB-234	...	A96061	T4
41	...	Cond. & heat exch. tubes	SB-234	...	A96061	T6
42	...	Cond. & heat exch. tubes	SB-234	...	A96061	T4 wld.
43	...	Cond. & heat exch. tubes	SB-234	...	A96061	T6 wld.
44	...	Smls. extr. tube	SB-241	...	A96061	T4
45	...	Smls. extr. tube	SB-241	...	A96061	T6

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	1.501-3.000	25	41	18	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
2	0.188-0.499	25	46	33	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
3	0.500-1.500	25	44	31	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
4	1.501-3.000	25	41	29	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
5	≤5.000	25	41	19	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
6	≤5.000	25	42	26	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
7	≤5.000	25	41	19	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
8	...	25	41	19	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19
9	...	25	42	26	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
10	...	25	41	19	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
11	0.188-0.499	25	46	33	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
12	0.500-1.500	25	44	31	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
13	1.501-3.000	25	41	29	NP	150 (Cl. 3 only)	150	150	NFA-10	G18, G19, W3
14	0.051-3.000	22	25	9.5	NP	250 (Cl. 3 only)	400	400	NFA-8	T2
15	0.250-0.499	22	28	16	NP	250 (Cl. 3 only)	400	400	NFA-8	T1, W3
16	0.500-3.000	22	25	9.5	NP	250 (Cl. 3 only)	400	400	NFA-8	T2, W3
17	0.051-2.000	22	31	23	NP	200 (Cl. 3 only)	400	400	NFA-3	T1, W3
18	0.051-1.000	22	34	26	NP	200 (Cl. 3 only)	400	400	NFA-4	T1, W3
19	0.006-0.249	23	30	16	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W4
20	0.250-3.000	23	30	16	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W4
21	0.006-0.249	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, T3, W4
22	0.250-4.000	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G24, T3, W4, W9
23	4.001-6.000	23	40	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G24, T3, W4, W9
24	0.006-0.249	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W7
25	0.250-3.000	23	24	...	NP	NP	400	400	NFA-13	G24, T3, W7
26	0.006-0.249	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, T3, W7
27	0.250-6.000	23	24	...	NP	NP	400	400	NFA-12,13	G24, T3, W7, W9
28	0.025-0.500	23	30	16	NP	400 (Cl. 3 only)	400	400	NFA-13	T3, W4
29	0.025-0.500	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
30	0.025-0.500	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-13	T3, W7
31	0.025-0.500	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W7, W9
32	0.125-0.249	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12	G24, T3, W4
33	0.250-8.000	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G24, T3, W4, W9
34	0.125-0.249	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	G13, G24, T3, W7
35	0.250-8.000	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G13, G24, T3, W7, W9
36	...	23	26	16	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W4
37	...	23	38	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G24, T3, W4, W9
38	...	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W7
39	...	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G13, G24, T3, W7, W9
40	0.025-0.200	23	30	16	NP	400 (Cl. 3 only)	400	400	NFA-13	T3, W4
41	0.025-0.200	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12	T3, W4
42	0.025-0.200	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-13	T3, W7
43	0.025-0.200	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12	T3, W7
44	...	23	26	16	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W4
45	...	23	38	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G24, T3, W4, W9

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	13.1	13.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	12.6	12.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	13.1	13.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	12.6	12.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	11.7	11.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	6.3	6.3	6.3	6.3	6.1	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
15	8.0	8.0	8.0	7.5	6.1	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
16	6.3	6.3	6.3	6.3	6.1	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
17	8.9	8.9	8.9	7.5	6.1	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
18	9.7	9.7	9.7	7.5	6.1	4.1	2.4	...	...	...	...	...	...	...	...	...	...	...
19	8.6	8.6	8.6	8.5	6.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
20	8.6	8.6	8.6	8.5	6.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
21	12.0	12.0	12.0	11.7	8.4	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
22	12.0	12.0	12.0	11.7	8.4	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
23	11.4	11.4	11.4	11.1	8.2	6.3	4.4	...	...	...	...	...	...	...	...	...	...	...
24	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
25	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
26	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
27	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
28	8.6	8.6	8.6	8.5	6.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
29	12.0	12.0	12.0	11.7	8.4	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
30	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
31	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
32	12.0	12.0	12.0	11.7	8.4	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
33	12.0	12.0	12.0	11.7	8.4	6.4	4.5	...	...	...	...	...	...	...	...	...	...	...
34	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
35	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
36	7.4	7.4	7.4	7.4	6.0	5.8	4.4	...	...	...	...	...	...	...	...	...	...	...
37	10.9	10.9	10.9	10.6	7.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
38	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
39	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
40	8.6	8.6	8.6	8.5	6.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
41	12.0	12.0	12.0	11.7	8.4	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
42	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
43	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
44	7.4	7.4	7.4	7.4	6.0	5.8	4.4	...	...	...	...	...	...	...	...	...	...	...
45	10.9	10.9	10.9	10.6	7.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Smls. extr. tube	SB-241	...	A96061	T4 wld.
2	...	Smls. extr. tube	SB-241	...	A96061	T6 wld.
3	...	Smls. pipe	SB-241	...	A96061	T6 drawn
4	...	Smls. pipe	SB-241	...	A96061	T6
5	...	Smls. pipe	SB-241	...	A96061	T6 wld.
6	...	Die forgings	SB-247	...	A96061	T6
7	...	Hand forgings	SB-247	...	A96061	T6
8	...	Hand forgings	SB-247	...	A96061	T6
9	...	Die & hand forgings	SB-247	...	A96061	T6 wld.
10	...	Shapes	SB-308	...	A96061	T6
11	...	Shapes	SB-308	...	A96061	T6 wld.
12	...	Drawn smls. tube	SB-210	...	A96063	T6
13	...	Drawn smls. tube	SB-210	...	A96063	T6 wld.
14	...	Bar, rod, shapes	SB-221	...	A96063	T1
15	...	Bar, rod, shapes	SB-221	...	A96063	T1
16	...	Bar, rod, shapes	SB-221	...	A96063	T5
17	...	Bar, rod, shapes	SB-221	...	A96063	T5
18	...	Bar, rod, shapes	SB-221	...	A96063	T6
19	...	Bar, rod, shapes	SB-221	...	A96063	T5 wld.
20	...	Bar, rod, shapes	SB-221	...	A96063	T6 wld.
21	...	Smls. extr. tube	SB-241	...	A96063	T1
22	...	Smls. extr. tube	SB-241	...	A96063	T1
23	...	Smls. extr. tube	SB-241	...	A96063	T5
24	...	Smls. extr. tube	SB-241	...	A96063	T5
25	...	Smls. extr. tube	SB-241	...	A96063	T6
26	...	Smls. extr. tube	SB-241	...	A96063	T5 wld.
27	...	Smls. extr. tube	SB-241	...	A96063	T6 wld.
28	...	Smls. pipe	SB-241	...	A96063	T6
29	...	Smls. pipe	SB-241	...	A96063	T6 wld.
(23) 30	...	Bar, rod	SB-187	...	C10200	O60
(23) 31	...	Bar, rod	SB-187	...	C10200	O60
(23) 32	...	Smls. tube	SB-75	...	C10200	O50, O60
(23) 33	...	Smls. tube	SB-75	...	C10200	O50, O60
34	...	Smls. pipe	SB-42	...	C10200	O61
35	...	Smls. pipe	SB-42	...	C10200	O61
36	...	Plate, sheet, strip	SB-152	...	C10200	H00
37	...	Plate, sheet, strip	SB-152	...	C10200	H01
38	...	Plate, sheet, strip	SB-152	...	C10200	H02
39	...	Plate, sheet, strip	SB-152	...	C10200	H03
40	...	Plate, sheet, strip	SB-152	...	C10200	H04
41	...	Plate, sheet, strip	SB-152	...	C10200	M20, O25
42	...	Plate, sheet, strip	SB-152	...	C10200	M20, O25
43	...	Smls. pipe	SB-42	...	C10200	H55
44	...	Smls. tube	SB-75	...	C10200	H55
45	...	Smls. cond. tube	SB-111	...	C10200	H55

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-13	G24, T3, W7
2	...	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G24, T3, W7, W9
3	<1.000	23	42	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
4	≥1.000	23	38	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
5	...	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W7, W9
6	≤4.000	23	38	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
7	≤4.000	23	37	33	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
8	4.001-8.000	23	35	32	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
9	≤8.000	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W7, W9
10	...	23	38	35	NP	400 (Cl. 3 only)	400	400	NFA-12,13	T3, W4, W9
11	...	23	24	...	NP	400 (Cl. 3 only)	400	400	NFA-12,13	G13, T3, W7, W9
12	0.025-0.500	23	33	28	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W4
13	0.025-0.500	23	17	8	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W7
14	≤0.500	23	17	9	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W4
15	0.501-1.000	23	16	8	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W4
16	≤0.500	23	22	16	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W4
17	0.501-1.000	23	21	15	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W4
18	≤1.000	23	30	25	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W4
19	≤1.000	23	17	8	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W7
20	≤1.000	23	17	8	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W7
21	≤0.500	23	17	9	NP	350 (Cl. 3 only)	NP	NP	NFA-1	T3, W4
22	0.501-1.000	23	16	8	NP	350 (Cl. 3 only)	NP	NP	NFA-1	T3, W4
23	≤0.500	23	22	16	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W4
24	0.501-1.000	23	21	15	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W4
25	≤1.000	23	30	25	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W4
26	≤1.000	23	17	8	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W7
27	≤1.000	23	17	8	NP	350 (Cl. 3 only)	400	400	NFA-1	T3, W7
28	≤1.000	23	30	25	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W4
29	≤1.000	23	17	8	NP	400 (Cl. 3 only)	400	400	NFA-1	T3, W7
30	All	31	28	8	NP	300	400	400	NFC-1	T3
31	All	31	28	8	NP	300	400	400	NFC-1	G5, T3
32	All	31	30	9	400	300 (Cl. 3 only)	400	400	NFC-1	G1, T3
33	All	31	30	9	400	300 (Cl. 3 only)	400	400	NFC-1	G1, G5, T3
34	All	31	30	9	400	300	400	400	NFC-1	G1, T3
35	All	31	30	9	400	300	400	400	NFC-1	G1, G5, T3
36	...	31	30	10	NP	300 (Cl. 3 only)	400	400	NFC-1	G33, T3, W3
37	...	31	30	10	NP	300 (Cl. 3 only)	400	400	NFC-1	G33, T3, W3
38	...	31	30	10	NP	300 (Cl. 3 only)	400	400	NFC-1	G33, T3, W3
39	...	31	30	10	NP	300 (Cl. 3 only)	400	400	NFC-1	G33, T3, W3
40	...	31	30	10	NP	300 (Cl. 3 only)	400	400	NFC-1	G33, T3, W3
41	...	31	30	10	NP	300 (Cl. 3 only)	400	400	NFC-1	T3
42	...	31	30	10	NP	250 (Cl. 3 only)	400	400	NFC-1	G5, T2
43	2 < NPS ≤ 12	31	36	30	400	400	400	400	NFC-6	G1, G9, W3
44	All	31	36	30	400	400 (Cl. 3 only)	400	400	NFC-6	G1, G9, W3
45	...	31	36	30	NP	400	400	400	NFC-6	G9, W3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
2	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
3	12.0	12.0	12.0	11.7	8.4	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
4	10.9	10.9	10.9	10.6	7.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
5	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
6	10.9	10.9	10.9	10.6	7.9	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
7	10.6	10.6	10.6	10.5	7.7	6.3	4.5	...	...	...	...	...	...	...	...	...	...	...
8	10.0	10.0	10.0	9.9	7.4	6.1	4.5	...	...	...	...	...	...	...	...	...	...	...
9	6.9	6.9	6.9	6.8	5.5	4.6	3.5	...	...	...	...	...	...	...	...	...	...	...
10	10.9	10.9	10.9	10.6	7.2	5.6	4.0	...	...	...	...	...	...	...	...	...	...	...
11	6.9	6.9	6.9	6.8	5.0	4.2	3.2	...	...	...	...	...	...	...	...	...	...	...
12	9.4	9.4	9.4	8.3	5.5	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
13	4.9	4.9	4.9	4.9	3.9	3.0	2.0	...	...	...	...	...	...	...	...	...	...	...
14	4.9	4.9	4.9	4.9	4.2	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
15	4.6	4.6	4.6	4.6	4.0	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
16	6.3	6.3	6.1	5.8	4.6	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
17	6.0	6.0	5.9	5.6	4.3	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
18	8.6	8.6	8.6	7.5	5.0	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
19	4.9	4.9	4.9	4.9	3.9	3.0	2.0	...	...	...	...	...	...	...	...	...	...	...
20	4.9	4.9	4.9	4.9	3.9	3.0	2.0	...	...	...	...	...	...	...	...	...	...	...
21	4.9	4.9	4.9	4.9	4.2	3.4	...	...	...	...	...	...	...	...	...	...	...	...
22	4.6	4.6	4.6	4.6	4.0	3.4	...	...	...	...	...	...	...	...	...	...	...	...
23	6.3	6.3	6.1	5.8	4.6	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
24	6.0	6.0	5.9	5.6	4.4	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
25	8.6	8.6	8.6	7.5	5.0	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
26	4.9	4.9	4.9	4.9	3.9	3.0	2.0	...	...	...	...	...	...	...	...	...	...	...
27	4.9	4.9	4.9	4.9	3.9	3.0	2.0	...	...	...	...	...	...	...	...	...	...	...
28	8.6	8.6	8.6	7.5	5.0	3.4	2.0	...	...	...	...	...	...	...	...	...	...	...
29	4.9	4.9	4.9	4.9	3.9	3.0	2.0	...	...	...	...	...	...	...	...	...	...	...
30	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
31	5.3	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
32	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
33	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
34	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
35	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
36	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
37	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
38	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
39	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
40	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
41	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
42	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
43	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
44	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
45	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	...	Smls. U-bend tube	SB-395	...	C10200	H55
2	...	Smls. pipe	SB-42	...	C10200	H80
3	...	Smls. tube	SB-75	...	C10200	H80
4	...	Smls. cond. tube	SB-111	...	C10200	H80
5	...	Plate, sheet, strip	SB-152	...	C10400	H00
6	...	Plate, sheet, strip	SB-152	...	C10400	H01
7	...	Plate, sheet, strip	SB-152	...	C10400	H02
8	...	Plate, sheet, strip	SB-152	...	C10400	H03
9	...	Plate, sheet, strip	SB-152	...	C10400	H04
10	...	Plate, sheet, strip	SB-152	...	C10400	M20, 025
11	...	Plate, sheet, strip	SB-152	...	C10400	M20, 025
12	...	Plate, sheet, strip	SB-152	...	C10500	H00
13	...	Plate, sheet, strip	SB-152	...	C10500	H01
14	...	Plate, sheet, strip	SB-152	...	C10500	H02
15	...	Plate, sheet, strip	SB-152	...	C10500	H03
16	...	Plate, sheet, strip	SB-152	...	C10500	H04
17	...	Plate, sheet, strip	SB-152	...	C10500	M20, 025
18	...	Plate, sheet, strip	SB-152	...	C10500	M20, 025
19	...	Plate, sheet, strip	SB-152	...	C10700	H00
20	...	Plate, sheet, strip	SB-152	...	C10700	H01
21	...	Plate, sheet, strip	SB-152	...	C10700	H02
22	...	Plate, sheet, strip	SB-152	...	C10700	H03
23	...	Plate, sheet, strip	SB-152	...	C10700	H04
24	...	Plate, sheet, strip	SB-152	...	C10700	M20, 025
25	...	Plate, sheet, strip	SB-152	...	C10700	M20, 025
(23) 26	...	Bar	SB-187	...	C11000	H04
27	...	Bar, rod	SB-187	...	C11000	O60
28	...	Bar, rod	SB-187	...	C11000	O60
29	...	Plate, sheet, strip, bar	SB-152	...	C11000	H00
30	...	Plate, sheet, strip, bar	SB-152	...	C11000	H01
31	...	Plate, sheet, strip, bar	SB-152	...	C11000	H02
32	...	Plate, sheet, strip, bar	SB-152	...	C11000	H03
33	...	Plate, sheet, strip, bar	SB-152	...	C11000	H04
34	...	Plate, sheet, strip, bar	SB-152	...	C11000	M20, 025
35	...	Plate, sheet, strip, bar	SB-152	...	C11000	M20, 025
(23) 36	...	...	...	...	...	...
(23) 37	...	...	...	...	...	...
(23) 38	...	Smls. tube	SB-75	...	C12000	O50, O60
(23) 39	...	Smls. tube	SB-75	...	C12000	O50, O60
40	...	Smls. pipe	SB-42	...	C12000	O61
41	...	Smls. pipe	SB-42	...	C12000	O61
42	...	Smls. pipe	SB-42	...	C12000	H55
43	...	Smls. tube	SB-75	...	C12000	H55
44	...	Smls. cond. tube	SB-111	...	C12000	H55
45	...	Smls. U-bend tube	SB-395	...	C12000	H55

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	31	36	30	NP	400 (Cl. 3 only)	400	400	NFC-6	G9, W3
2	$\frac{1}{8} < NPS \leq 2$	31	45	40	400	300	400	400	NFC-6	G1, G6, G9, T4, W3
3	<4	31	45	40	400	350	400	400	NFC-6	G1, G6, G9, T4, W3
4	...	31	45	40	NP	300	400	400	NFC-6	G6, G9, T4, W3
5	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
6	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
7	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
8	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
9	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
10	...	31	30	10	NP	300	400	400	NFC-1	T3
11	...	31	30	10	NP	250	400	400	NFC-1	G5, T2
12	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
13	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
14	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
15	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
16	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
17	...	31	30	10	NP	300	400	400	NFC-1	T3
18	...	31	30	10	NP	250	400	400	NFC-1	G5, T2
19	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
20	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
21	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
22	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
23	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
24	...	31	30	10	NP	300	400	400	NFC-1	T3
25	...	31	30	10	NP	250	400	400	NFC-1	G5, T2
26	All	31	28	8	NP	300	400	400	NFC-1	G33, T3
27	All	31	28	8	NP	300	400	400	NFC-1	T3
28	All	31	28	8	NP	300	400	400	NFC-1	G5, T3
29	...	31	30	10	NP	NP	400	400	NFC-1	G33, T3, W3
30	...	31	30	10	NP	NP	400	400	NFC-1	G33, T3, W3
31	...	31	30	10	NP	NP	400	400	NFC-1	G33, T3, W3
32	...	31	30	10	NP	NP	400	400	NFC-1	G33, T3, W3
33	...	31	30	10	NP	NP	400	400	NFC-1	G33, T3, W3
34	...	31	30	10	NP	NP	400	400	NFC-1	T3
35	...	31	30	10	NP	NP	400	400	NFC-1	G5, T2
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	All	31	30	9	400	300 (Cl. 3 only)	400	400	NFC-1	G1, T3
39	All	31	30	9	400	300 (Cl. 3 only)	400	400	NFC-1	G1, G5, T3
40	All	31	30	9	400	300	400	400	NFC-1	G1, T3
41	All	31	30	9	400	300	400	400	NFC-1	G1, G5, T3
42	$2 < NPS \leq 12$	31	36	30	400	400	400	400	NFC-6	G1, G9, W3
43	All	31	36	30	400	400 (Cl. 3 only)	400	400	NFC-6	G1, G9, W3
44	...	31	36	30	NP	400	400	400	NFC-6	G9, W3
45	...	31	36	30	NP	400 (Cl. 3 only)	400	400	NFC-6	G9, W3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
2	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
3	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
4	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
5	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
6	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
7	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
8	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
9	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
10	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
11	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
12	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
13	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
14	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
15	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
16	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
17	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
18	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
19	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
20	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
21	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
22	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
23	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
24	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
25	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
26	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
27	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
28	5.3	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
29	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
30	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
31	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
32	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
33	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
34	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
35	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
39	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
40	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
41	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
42	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
43	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
44	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
45	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Smls. pipe	SB-42	...	C12000	H80
2	...	Smls. tube	SB-75	...	C12000	H80
3	...	Smls. cond. tube	SB-111	...	C12000	H80
(23) 4	...	Smls. tube	SB-75	...	C12200	O50
(23) 5	...	Smls. tube	SB-75	...	C12200	O50
(23) 6	...	Smls. tube	SB-75	...	C12200	O60
(23) 7	...	Smls. tube	SB-75	...	C12200	O60
8	...	Smls. pipe	SB-42	...	C12200	O61
9	...	Smls. pipe	SB-42	...	C12200	O61
10	...	Finned tube	SB-359	...	C12200	O61
11	...	Finned tube	SB-359	...	C12200	O61
12	...	Wld. cond. tube	SB-543	...	C12200	W061
13	...	Wld. cond. tube	SB-543	...	C12200	W061
14	...	Plate, sheet, strip	SB-152	...	C12200	H00
15	...	Plate, sheet, strip	SB-152	...	C12200	H01
16	...	Plate, sheet, strip	SB-152	...	C12200	H02
17	...	Plate, sheet, strip	SB-152	...	C12200	H03
18	...	Plate, sheet, strip	SB-152	...	C12200	H04
19	...	Plate, sheet, strip	SB-152	...	C12200	M20, O25
20	...	Plate, sheet, strip	SB-152	...	C12200	M20, O25
21	...	Wld. cond. tube	SB-543	...	C12200	WC55
22	...	Smls. pipe	SB-42	...	C12200	H55
23	...	Smls. tube	SB-75	...	C12200	H55
24	...	Smls. cond. tube	SB-111	...	C12200	H55
25	...	Finned tube	SB-359	...	C12200	H55
26	...	Smls. U-bend tube	SB-395	...	C12200	H55
27	...	Smls. pipe	SB-42	...	C12200	H80
28	...	Smls. cond. tube	SB-75	...	C12200	H80
29	...	Smls. tube	SB-111	...	C12200	H80
30	...	Plate, sheet, strip, bar	SB-152	...	C12300	H00
31	...	Plate, sheet, strip, bar	SB-152	...	C12300	H01
32	...	Plate, sheet, strip, bar	SB-152	...	C12300	H02
33	...	Plate, sheet, strip, bar	SB-152	...	C12300	H03
34	...	Plate, sheet, strip, bar	SB-152	...	C12300	H04
35	...	Plate, sheet, strip, bar	SB-152	...	C12300	M20, O25
36	...	Plate, sheet, strip, bar	SB-152	...	C12300	M20, O25
37	...	Plate, sheet, strip	SB-152	...	C14200	M20, O25
38	...	Plate, sheet, strip	SB-152	...	C14200	M20, O25
39	...	Smls. cond. tube	SB-111	...	C14200	H55
40	...	Smls. U-bend tube	SB-395	...	C14200	H55
41	...	Smls. cond. tube	SB-111	...	C14200	H80
42	...	Smls. cond. tube	SB-111	...	C19200	O61
(23) 43	...	Smls. cond. tube	SB-111	...	C19200	O61
44	...	Smls. U-bend tube	SB-395	...	C19200	O61
(23) 45	...	Smls. U-bend tube	SB-395	...	C19200	O61

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	$\frac{1}{8} < \text{NPS} \leq 2$	31	45	40	400	300	400	400	NFC-6	G1, G6, G9, T4, W3
2	<4	31	45	40	400	350 (Cl. 3 only)	400	400	NFC-6	G1, G6, G9, T4, W3
3	...	31	45	40	NP	300	400	400	NFC-6	G6, G9, T4, W3
4	All	31	30	9	400	300	400	400	NFC-7	G1, T3
5	All	31	30	9	400	300	400	400	NFC-7	G1, G5, T3
6	All	31	30	9	400	300	400	400	NFC-1	G1, T3
7	All	31	30	9	400	300	400	400	NFC-1	G1, G5, T3
8	All	31	30	9	400	300	400	400	NFC-1	G1, T3
9	All	31	30	9	400	300	400	400	NFC-1	G1, G5, T3
10	...	31	30	9	NP	300 (Cl. 3 only)	400	NP	NFC-1	G1, T3
11	...	31	30	9	NP	300 (Cl. 3 only)	400	NP	NFC-1	G1, G5, T3
12	...	31	30	9	NP	300 (Cl. 3 only)	400	400	NFC-1	G14, T3, W11
13	...	31	30	9	NP	300 (Cl. 3 only)	400	400	NFC-1	G5, G14, T3, W11
14	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
15	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
16	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
17	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
18	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
19	...	31	30	10	NP	300	400	400	NFC-1	T3
20	...	31	30	10	NP	250	400	400	NFC-1	G5, T2
21	...	31	32	15	NP	300 (Cl. 3 only)	400	400	NFC-1	G14, T4, W10
22	$2 < \text{NPS} \leq 12$	31	36	30	400	400	400	400	NFC-6	G1, G9, W3
23	All	31	36	30	400	400 (Cl. 3 only)	400	400	NFC-6	G1, G9, W3
24	...	31	36	30	NP	400	400	400	NFC-6	G9, W3
25	...	31	36	30	NP	300 (Cl. 3 only)	400	NP	NFC-6	G1, G9, W3
26	...	31	36	30	NP	400 (Cl. 3 only)	400	400	NFC-6	G9, W3
27	$\frac{1}{8} < \text{NPS} \leq 2$	31	45	40	400	300	400	400	NFC-6	G1, G6, G9, T4, W3
28	<4	31	45	40	400	350 (Cl. 3 only)	400	400	NFC-6	G1, G6, G9, T4, W3
29	...	31	45	40	NP	300	400	400	NFC-6	G6, G9, T4, W3
30	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
31	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
32	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
33	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
34	...	31	30	10	NP	300	400	400	NFC-1	G33, T3, W3
35	...	31	30	10	NP	300	400	400	NFC-1	T3
36	...	31	30	10	NP	250	400	400	NFC-1	G5, T2
37	...	31	30	10	NP	300 (Cl. 3 only)	NP	NP	NFC-1	...
38	...	31	30	10	NP	250 (Cl. 3 only)	NP	NP	NFC-1	G5
39	...	31	36	30	NP	400	400	400	NFC-6	G9, W3
40	...	31	36	30	NP	400 (Cl. 3 only)	400	400	NFC-6	G9, W3
41	...	31	45	40	NP	300	400	400	NFC-6	G6, G9, T4, W3
42	...	31	38	12	NP	NP	300	300	NFC-1	...
43	...	31	38	12	NP	NP	300	300	NFC-1	G5, T2
44	...	31	38	12	NP	NP	300	300	NFC-1	...
45	...	31	38	12	NP	NP	300	300	NFC-1	G5, T2

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
2	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
3	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
4	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
5	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
6	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
7	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
8	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
9	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
10	6.0	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
11	6.0	6.0	6.0	6.0	6.0	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
12	5.7	5.0	5.0	5.0	5.0	3.8	2.5	...	...	...	...	...	...	...	...	...	...	...
13	5.7	5.7	5.7	5.7	5.4	3.8	2.5	...	...	...	...	...	...	...	...	...	...	...
14	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
15	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
16	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
17	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
18	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
19	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
20	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
21	7.8	7.8	7.8	7.8	7.5	7.3	2.6	...	...	...	...	...	...	...	...	...	...	...
22	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
23	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
24	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
25	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
26	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
27	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
28	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
29	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
30	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
31	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
32	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
33	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
34	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
35	6.7	5.9	5.9	5.9	5.8	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
36	6.7	6.7	6.7	6.7	6.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...	...
37	6.7	5.9	5.9	5.9	5.8	...	...	...	...	...	...	...	...	...	...	...	...	...
38	6.7	6.7	6.7	6.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
40	10.3	10.3	10.3	10.3	10.0	9.7	9.4	...	...	...	...	...	...	...	...	...	...	...
41	12.9	12.9	12.9	12.9	12.5	11.8	4.3	...	...	...	...	...	...	...	...	...	...	...
42	8.0	7.1	6.7	6.4	6.2	...	...	...	...	...	...	...	...	...	...	...	...	...
43	8.0	8.0	8.0	8.0	6.3	...	...	...	...	...	...	...	...	...	...	...	...	...
44	8.0	7.1	6.7	6.4	6.2	...	...	...	...	...	...	...	...	...	...	...	...	...
45	8.0	8.0	8.0	8.0	6.3	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	...	Wld. cond. tube	SB-543	...	C19400	W061
(23) 2	...	Wld. cond. tube	SB-543	...	C19400	W061
(23) 3	...	Wld. cond. tube	SB-543	...	C19400	WC55
4	...	Smls. pipe	SB-43	...	C23000	H58
5	...	Smls. tube	SB-135	...	C23000	O50
6	...	Smls. red brass tube	SB-135	...	C23000	O60
7	...	Smls. pipe	SB-43	...	C23000	O61
8	...	Smls. cond. tube	SB-111	...	C23000	O61
9	...	Smls. tube	SB-395	...	C23000	O61
10	...	Wld. cond. tube	SB-543	...	C23000	W061
11	...	Wld. cond. tube	SB-543	...	C23000	WC55
12	...	Smls. tube	SB-111	...	C23000	O61
13	...	Plate	SB-171	...	C36500	M10, M20
14	...	Plate	SB-171	...	C36500	O20, O25
15	...	Plate	SB-171	...	C36500	M10, M20
16	...	Plate	SB-171	...	C36500	O20, O25
17	...	Plate	SB-171	...	C36500	M10, M20
18	...	Plate	SB-171	...	C36500	O20, O25
(23) 19	...	Forgings	SB-283	...	C37700	M10, M11, O20
(23) 20	...	Forgings	SB-283	...	C37700	M10, M11, O20
(23) 21	...	Forgings	SB-283	...	C37700	M10, M11, O20
(23) 22	...	Forgings	SB-283	...	C37700	M10, M11, O20
23	...	Plate	SB-171	...	C44300	M10, M20
24	...	Plate	SB-171	...	C44300	O20, O25
25	...	Smls. cond. tube	SB-111	...	C44300	O61
26	...	Finned tube	SB-359	...	C44300	O61
27	...	Smls. U-bend tube	SB-395	...	C44300	O61
28	...	Wld. cond. tube	SB-543	...	C44300	W061
29	...	Plate	SB-171	...	C44400	M10, M20
30	...	Plate	SB-171	...	C44400	O20, O25
31	...	Smls. cond. tube	SB-111	...	C44400	O61
32	...	Finned tube	SB-359	...	C44400	O61
33	...	Smls. U-bend tube	SB-395	...	C44400	O61
34	...	Wld. cond. tube	SB-543	...	C44400	W061
35	...	Plate	SB-171	...	C44500	M10, M20
36	...	Plate	SB-171	...	C44500	O20, O25
37	...	Smls. cond. tube	SB-111	...	C44500	O61
38	...	Finned tube	SB-359	...	C44500	O61
39	...	Smls. U-bend tube	SB-395	...	C44500	O61
40	...	Wld. cond. tube	SB-543	...	C44500	W061
41	...	Plate	SB-171	...	C46400	M10, M20
42	...	Plate	SB-171	...	C46400	O20, O25
43	...	Plate	SB-171	...	C46400	M10, M20
44	...	Plate	SB-171	...	C46400	O20, O25
45	...	Plate	SB-171	...	C46500	M10, M20

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	31	45	15	NP	NP	400	400	NFC-5	G14, T4, W11
2	...	31	45	15	NP	NP	400	400	NFC-5	G5, G14, T3, W11
3	...	31	45	22	NP	300 (Cl. 3 only)	400	400	NFC-5	G14, T3, W10
4	...	32	40	12	450	300 (Cl. 3 only)	450	450	NFC-1	G1, G33, T3, W3
5	...	32	40	12	NP	300 (Cl. 3 only)	NP	NP	NFC-1	...
6	...	32	40	12	NP	300 (Cl. 3 only)	450	450	NFC-1	T3
7	...	32	40	12	450	300 (Cl. 3 only)	450	450	NFC-1	G1, T3
8	...	32	40	12	NP	300 (Cl. 3 only)	450	450	NFC-1	T3
9	...	32	40	12	NP	300 (Cl. 3 only)	450	450	NFC-1	T3
10	...	32	40	12	NP	300 (Cl. 3 only)	450	450	NFC-1	G14, T3, W11
11	...	32	42	20	NP	300 (Cl. 3 only)	450	450	NFC-2	G14, G33, T3, W10
12	...	32	50	20	400	350 (Cl. 3 only)	400	400	NFC-3	G1, G6, T3
13	$3.5 < t \leq 5$	32	40	12	NP	350 (Cl. 3 only)	400	400	NFC-2	G7, T4
14	$3.5 < t \leq 5$	32	40	12	NP	350 (Cl. 3 only)	400	400	NFC-2	G7, T4
15	$2 < t \leq 3.5$	32	45	15	NP	350 (Cl. 3 only)	400	400	NFC-2	T4
16	$2 < t \leq 3.5$	32	45	15	NP	350 (Cl. 3 only)	400	400	NFC-2	T4
17	≤ 2	32	50	20	NP	350 (Cl. 3 only)	400	400	NFC-2	T3
18	≤ 2	32	50	20	NP	350 (Cl. 3 only)	400	400	NFC-2	T3
19	$> 1\frac{1}{2}$	...	46	15	NP	NP	400	400	NFC-2	G17, T2, W14
20	$> 1\frac{1}{2}$	...	46	15	NP	NP	400	400	NFC-2	G5, G17, T2, W14
21	$\leq 1\frac{1}{2}$	...	50	18	NP	NP	400	400	NFC-2	G17, T1, W14
22	$\leq 1\frac{1}{2}$	...	50	18	NP	NP	400	400	NFC-2	G5, G17, T1, W14
23	≤ 4	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
24	≤ 4	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
25	...	32	45	15	450	350 (Cl. 3 only)	450	450	NFC-2	G1, G6, T4
26	...	32	45	15	NP	350 (Cl. 3 only)	450	NP	NFC-2	G1, G6, T4
27	...	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
28	...	32	45	15	NP	NP	450	450	NFC-2	G7, G14, T4, W11
29	≤ 4	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
30	≤ 4	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
31	...	32	45	15	450	350 (Cl. 3 only)	450	450	NFC-2	G1, G6, T4
32	...	32	45	15	NP	350 (Cl. 3 only)	450	NP	NFC-2	G1, G6, T4
33	...	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
34	...	32	45	15	NP	NP	450	450	NFC-2	G7, G14, T4, W11
35	≤ 4	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
36	≤ 4	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
37	...	32	45	15	450	350 (Cl. 3 only)	450	450	NFC-2	G1, G6, T4
38	...	32	45	15	NP	350 (Cl. 3 only)	450	NP	NFC-2	G1, G6, T4
39	...	32	45	15	NP	350 (Cl. 3 only)	450	450	NFC-2	T4
40	...	32	45	15	NP	NP	450	450	NFC-2	G7, G14, T4, W11
41	$3 < t \leq 5$	32	50	18	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
42	$3 < t \leq 5$	32	50	18	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
43	≤ 3	32	50	20	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
44	≤ 3	32	50	20	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
45	$3 < t \leq 5$	32	50	18	NP	300 (Cl. 3 only)	400	400	NFC-2	T3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	8.5	8.4	8.3	8.1	7.8	7.6	6.0	...	...	...	...	...	...	...	...	...	...	...
2	8.5	8.5	8.5	8.5	8.5	7.7	6.0	...	...	...	...	...	...	...	...	...	...	...
3	10.9	10.9	10.9	10.6	10.1	7.7	6.0	...	...	...	...	...	...	...	...	...	...	...
4	8.0	8.0	8.0	8.0	8.0	7.0	5.0	2.0	...	...	...	...	...	...	...	...	...	...
5	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...	...	...	...	...	...	...	...
6	8.0	8.0	8.0	8.0	8.0	7.0	5.0	2.0	...	...	...	...	...	...	...	...	...	...
7	8.0	8.0	8.0	8.0	8.0	7.0	5.0	2.0	...	...	...	...	...	...	...	...	...	...
8	8.0	8.0	8.0	8.0	8.0	7.0	5.0	2.0	...	...	...	...	...	...	...	...	...	...
9	8.0	8.0	8.0	8.0	8.0	7.0	5.0	2.0	...	...	...	...	...	...	...	...	...	...
10	6.8	6.8	6.8	6.8	6.8	6.0	4.3	1.7	...	...	...	...	...	...	...	...	...	...
11	6.8	6.8	6.8	6.8	6.8	6.0	4.3	1.7	...	...	...	...	...	...	...	...	...	...
12	13.3	13.3	13.3	13.3	13.3	10.8	5.3	...	...	...	...	...	...	...	...	...	...	...
13	8.0	8.0	8.0	8.0	8.0	8.0	5.3	...	...	...	...	...	...	...	...	...	...	...
14	8.0	8.0	8.0	8.0	8.0	8.0	5.3	...	...	...	...	...	...	...	...	...	...	...
15	10.0	10.0	10.0	10.0	10.0	10.0	5.3	...	...	...	...	...	...	...	...	...	...	...
16	10.0	10.0	10.0	10.0	10.0	10.0	5.3	...	...	...	...	...	...	...	...	...	...	...
17	13.3	13.3	13.3	13.3	13.3	10.8	5.3	...	...	...	...	...	...	...	...	...	...	...
18	13.3	13.3	13.3	13.3	13.3	10.8	5.3	...	...	...	...	...	...	...	...	...	...	...
19	10.0	8.3	8.3	8.3	5.3	3.1	1.8	...	...	...	...	...	...	...	...	...	...	...
20	10.0	10.0	10.0	8.3	5.3	3.1	1.8	...	...	...	...	...	...	...	...	...	...	...
21	12.0	10.0	10.0	8.6	5.3	3.1	1.8	...	...	...	...	...	...	...	...	...	...	...
22	12.0	12.0	12.0	8.6	5.3	3.1	1.8	...	...	...	...	...	...	...	...	...	...	...
23	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
24	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
25	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
26	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
27	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
28	8.5	8.5	8.5	8.5	8.5	8.5	4.5	1.7	...	...	...	...	...	...	...	...	...	...
29	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
30	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
31	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
32	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
33	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
34	8.5	8.5	8.5	8.5	8.5	8.5	4.5	1.7	...	...	...	...	...	...	...	...	...	...
35	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
36	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
37	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
38	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
39	10.0	10.0	10.0	10.0	10.0	10.0	5.3	2.0	...	...	...	...	...	...	...	...	...	...
40	8.5	8.5	8.5	8.5	8.5	8.5	4.5	1.7	...	...	...	...	...	...	...	...	...	...
41	12.0	12.0	12.0	12.0	12.0	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
42	12.0	12.0	12.0	12.0	12.0	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
43	13.3	13.3	13.3	13.3	13.3	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
44	13.3	13.3	13.3	13.3	13.3	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
45	12.0	12.0	12.0	12.0	12.0	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	...	Plate	SB-171	...	C46500	O20, O25
2	...	Plate	SB-171	...	C46500	M10, M20
3	...	Plate	SB-171	...	C46500	O20, O25
4	...	Smls. cond. tube	SB-111	...	C60800	O61
5	...	Smls. cond. tube	SB-111	...	C60800	O61
6	...	Smls. U-bend tube	SB-395	...	C60800	O61
7	...	Smls. U-bend tube	SB-395	...	C60800	O61
8	...	Plate	SB-171	...	C61400	M10, M20
9	...	Plate	SB-171	...	C61400	O20, O25
10	...	Plate, sheet	SB-169	...	C61400	O25 or O60
11	...	Plate	SB-171	...	C61400	M10, M20
12	...	Plate	SB-171	...	C61400	O20, O25
13	...	Plate, sheet	SB-169	...	C61400	O25 or O60
14	...	Plate, sheet	SB-169	...	C61400	O25 or O60
15	...	Plate	SB-171	...	C63000	M10, M20
16	...	Plate	SB-171	...	C63000	O20, O25
17	...	Plate	SB-171	...	C63000	M10, M20
18	...	Plate	SB-171	...	C63000	O20, O25
19	...	Plate	SB-171	...	C63000	M10, M20
20	...	Plate	SB-171	...	C63000	O20, O25
(23) 21	...	...	...	...	...	...
(23) 22	...	...	...	...	...	...
(23) 23	...	Forgings	SB-283	...	C64200	M10, M11, O20
(23) 24	...	Forgings	SB-283	...	C64200	M10, M11, O20
(23) 25	...	...	...	...	...	...
(23) 26	...	...	...	...	...	...
(23) 27	...	Forgings	SB-283	...	C64200	M10, M11, O20
(23) 28	...	Forgings	SB-283	...	C64200	M10, M11, O20
29	...	Bar, rod	SB-98	...	C65100	O60
(23) 30	...	Bar, rod	SB-98	...	C65100	O60
31	...	Bar, rod	SB-98	...	C65100	H02
(23) 32	...	Bar, rod	SB-98	...	C65100	H02
33	...	Smls. pipe & tube	SB-315	...	C65500	O61
(23) 34	...	Smls. pipe & tube	SB-315	...	C65500	O61
35	...	Plate, sheet	SB-96	...	C65500	O61
(23) 36	...	Plate, sheet	SB-96	...	C65500	O61
37	...	Bar, rod	SB-98	...	C65500	O60
(23) 38	...	Bar, rod	SB-98	...	C65500	O60
39	...	Bar, rod	SB-98	...	C65500	H02
40	...	Bar, rod	SB-98	...	C66100	O60
(23) 41	...	Bar, rod	SB-98	...	C66100	O60
42	...	Bar, rod	SB-98	...	C66100	H02
(23) 43	...	Smls. cond. tube	SB-111	...	C68700	O61
(23) 44	...	Smls. cond. tube	SB-111	...	C68700	O61
(23) 45	...	Smls. U-bend tube	SB-395	...	C68700	O61

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	$3 < t \leq 5$	32	50	18	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
2	≤ 3	32	50	20	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
3	≤ 3	32	50	20	NP	300 (Cl. 3 only)	400	400	NFC-2	T3
4	...	35	50	19	NP	300 (Cl. 3 only)	500	500	NFC-2	G6, T3
5	...	35	50	19	NP	300 (Cl. 3 only)	500	500	NFC-2	G5, G6, T3
6	...	35	50	19	NP	300 (Cl. 3 only)	500	500	NFC-2	T3
7	...	35	50	19	NP	300 (Cl. 3 only)	500	500	NFC-2	G5, T3
8	$2 < t \leq 5$	35	65	28	NP	500 (Cl. 3 only)	500	500	NFC-8	...
9	$2 < t \leq 5$	35	65	28	NP	500 (Cl. 3 only)	500	500	NFC-8	...
10	$2 < t \leq 5$	35	65	28	NP	500 (Cl. 3 only)	500	500	NFC-8	...
11	≤ 2	35	70	30	NP	500 (Cl. 3 only)	500	500	NFC-8	...
12	≤ 2	35	70	30	NP	500 (Cl. 3 only)	500	500	NFC-8	...
13	$\frac{1}{2} < t \leq 2$	35	70	30	NP	500 (Cl. 3 only)	500	500	NFC-8	...
14	$\leq \frac{1}{2}$	35	72	32	NP	450 (Cl. 3 only)	500	500	NFC-8	...
15	$3.5 < t \leq 5$	35	80	30	NP	500 (Cl. 3 only)	700	650	NFC-8	T6
16	$3.5 < t \leq 5$	35	80	30	NP	500 (Cl. 3 only)	700	650	NFC-8	T6
17	$2 < t \leq 3.5$	35	85	33	NP	500 (Cl. 3 only)	700	650	NFC-8	T6
18	$2 < t \leq 3.5$	35	85	33	NP	500 (Cl. 3 only)	700	650	NFC-8	T6
19	≤ 2	35	90	36	NP	500 (Cl. 3 only)	700	650	NFC-8	T6
20	≤ 2	35	90	36	NP	500 (Cl. 3 only)	700	650	NFC-8	T6
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	$> 1\frac{1}{2}$	...	68	23	NP	NP	500	500	NFC-3	G10, T4, W14
24	$> 1\frac{1}{2}$	...	68	23	NP	NP	500	500	NFC-3	G5, G10, T4, W14
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	$\leq 1\frac{1}{2}$	...	70	25	NP	NP	500	500	NFC-3	G10, T4, W14
28	$\leq 1\frac{1}{2}$	...	70	25	NP	NP	500	500	NFC-3	G5, G10, T4, W14
29	All	33	40	12	NP	300	350	350	NFC-1	G17
30	All	33	40	12	NP	300	350	350	NFC-1	G5, G17
31	≤ 2	33	55	20	NP	300	350	350	NFC-2	G17, W3
32	≤ 2	33	55	20	NP	300	350	350	NFC-2	G5, G17, W3
33	...	33	50	15	NP	300 (Cl. 3 only)	400	400	NFC-2	G17, T4
34	...	33	50	15	NP	300 (Cl. 3 only)	400	400	NFC-2	G5, G17, T4
35	≤ 2	33	50	18	NP	300 (Cl. 3 only)	350	350	NFC-2	G17, T3
36	≤ 2	33	50	18	NP	300 (Cl. 3 only)	350	350	NFC-2	G5, G17, T3
37	All	33	52	15	NP	300	350	350	NFC-2	G17
38	All	33	52	15	NP	300	350	350	NFC-2	G5, G17
39	≤ 2	33	70	38	NP	300	350	350	NFC-2	G17, W3
40	All	33	52	15	NP	300	350	350	NFC-2	G17
41	All	33	52	15	NP	300	350	350	NFC-2	G5, G17
42	≤ 2	33	70	38	NP	300	350	350	NFC-2	G17, W3
43	...	32	50	18	NP	300 (Cl. 3 only)	450	450	NFC-2	T3
44	...	32	50	18	NP	300 (Cl. 3 only)	450	450	NFC-2	G5, T3
45	...	32	50	18	NP	300 (Cl. 3 only)	450	450	NFC-2	T3

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	12.0	12.0	12.0	12.0	12.0	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
2	13.3	13.3	13.3	13.3	13.3	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
3	13.3	13.3	13.3	13.3	13.3	6.4	2.7	...	...	...	...	...	...	...	...	...	...	...
4	12.7	12.2	12.2	12.2	12.0	10.0	6.0	4.0	2.0	...	...	...	...	...	...	...	...	...
5	12.7	12.7	12.7	12.7	12.7	10.0	6.0	4.0	2.0	...	...	...	...	...	...	...	...	...
6	12.7	12.2	12.2	12.2	12.0	10.0	6.0	4.0	2.0	...	...	...	...	...	...	...	...	...
7	12.7	12.7	12.7	12.7	12.7	10.0	6.0	4.0	2.0	...	...	...	...	...	...	...	...	...
8	18.6	18.6	18.5	18.3	18.2	18.1	17.9	17.5	17.0	...	...	...	...	...	...	...	...	...
9	18.6	18.6	18.5	18.3	18.2	18.1	17.9	17.5	17.0	...	...	...	...	...	...	...	...	...
10	18.6	18.6	18.5	18.3	18.2	18.1	17.9	17.5	17.0	...	...	...	...	...	...	...	...	...
11	20.0	19.9	19.8	19.7	19.5	19.4	19.2	18.9	18.3	...	...	...	...	...	...	...	...	...
12	20.0	19.9	19.8	19.7	19.5	19.4	19.2	18.9	18.3	...	...	...	...	...	...	...	...	...
13	20.0	19.9	19.8	19.7	19.5	19.4	19.2	18.9	18.3	...	...	...	...	...	...	...	...	...
14	20.6	20.6	20.6	20.6	20.6	20.6	20.2	19.4	18.8	...	...	...	...	...	...	...	...	...
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.7	16.0	12.0	8.6	6.0	...	...	...	...	...
16	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.7	16.0	12.0	8.6	6.0	...	...	...	...	...
17	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.9	21.7	16.0	12.0	8.6	6.0	...	...	...	...	...
18	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.9	21.7	16.0	12.0	8.6	6.0	...	...	...	...	...
19	24.0	24.0	24.0	24.0	24.0	24.0	24.0	23.9	23.6	16.0	12.0	8.6	6.0	...	...	...	...	...
20	24.0	24.0	24.0	24.0	24.0	24.0	24.0	23.9	23.6	16.0	12.0	8.6	6.0	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	15.3	14.4	14.2	14.1	14.1	14.1	11.0	7.5	5.2	...	...	...	...	...	...	...	...	...
24	15.3	15.3	15.3	15.3	15.3	15.3	11.0	7.5	5.2	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	16.7	16.7	15.6	15.4	15.4	15.4	11.0	7.5	5.2	...	...	...	...	...	...	...	...	...
28	16.7	16.7	16.7	16.7	16.7	16.7	11.0	7.5	5.2	...	...	...	...	...	...	...	...	...
29	8.0	7.9	7.9	7.8	7.8	7.7	...	...	...	...	...	...	...	...	...	...	...	...
30	8.0	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...	...	...	...	...	...	...
31	13.3	13.3	13.2	12.9	12.5	12.0	...	...	...	...	...	...	...	...	...	...	...	...
32	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...	...	...	...	...	...	...	...
33	10.0	10.0	9.9	9.9	9.9	9.8	6.8	...	...	...	...	...	...	...	...	...	...	...
34	10.0	10.0	10.0	10.0	10.0	10.0	6.8	...	...	...	...	...	...	...	...	...	...	...
35	12.0	12.0	11.9	11.9	11.9	10.7	...	...	...	...	...	...	...	...	...	...	...	...
36	12.0	12.0	12.0	12.0	12.0	10.7	...	...	...	...	...	...	...	...	...	...	...	...
37	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...	...
38	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...
39	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	...	...	...	...	...	...	...
40	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...	...
41	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...
42	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	...	...	...	...	...	...	...
43	12.0	11.9	11.8	11.7	11.6	6.5	3.3	1.8	...	...	...	...	...	...	...	...	...	...
44	12.0	12.0	12.0	12.0	12.0	6.5	3.3	1.8	...	...	...	...	...	...	...	...	...	...
45	12.0	11.9	11.8	11.7	11.6	6.5	3.3	1.8	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
(23) 1	...	Smls. U-bend tube	SB-395	...	C68700	O61
2	...	Wld. cond. tube	SB-543	...	C68700	W061
(23) 3	...	Wld. cond. tube	SB-543	...	C68700	W061
4	...	Smls. cond. tube	SB-111	...	C70400	O61
5	...	Wld. tube	SB-543	...	C70400	W061
6	...	Smls. cond. tube	SB-111	...	C70400	H55
7	...	Smls. pipe & tube	SB-466	...	C70600	O60
8	...	Smls. pipe & tube	SB-466	...	C70600	O60
9	...	Wld. pipe	SB-467	...	C70600	W061
10	...	Wld. pipe	SB-467	...	C70600	W061
11	...	Bar, rod	SB-151	...	C70600	O60
12	...	Bar, rod	SB-151	...	C70600	O60
13	...	Plate	SB-171	...	C70600	M10, M20
14	...	Plate	SB-171	...	C70600	M10, M20
15	...	Plate, sheet	SB-171	...	C70600	M10, M20
16	...	Plate, sheet	SB-171	...	C70600	M10, M20
17	...	Plate	SB-171	...	C70600	M10, M20
18	...	Plate	SB-171	...	C70600	M10, M20
19	...	Plate	SB-171	...	C70600	O20, O25
20	...	Plate	SB-171	...	C70600	O20, O25
21	...	Plate, sheet	SB-171	...	C70600	O20, O25
22	...	Plate, sheet	SB-171	...	C70600	O20, O25
23	...	Plate	SB-171	...	C70600	O20, O25
24	...	Plate	SB-171	...	C70600	O20, O25
25	...	Smls. cond. tube	SB-111	...	C70600	O61
26	...	Smls. cond. tube	SB-111	...	C70600	O61
27	...	Smls. cond. tube	SB-111	...	C70600	O61
28	...	Smls. cond. tube	SB-111	...	C70600	O61
(23) 29	...	Finned tube	SB-359	...	C70600	O61
(23) 30	...	Finned tube	SB-359	...	C70600	O61
31	...	Smls. U-bend tube	SB-395	...	C70600	O61
32	...	Smls. U-bend tube	SB-395	...	C70600	O61
33	...	Wld. pipe	SB-467	...	C70600	W061
34	...	Wld. pipe	SB-467	...	C70600	W061
35	...	Wld. tube	SB-543	...	C70600	W061
36	...	Wld. tube	SB-543	...	C70600	W061
37	...	Finned wld. tube	SB-956	...	C70600	W061
38	...	Finned wld. tube	SB-956	...	C70600	W061
39	...	Wld. pipe	SB-467	...	C70600	WM50
40	...	Smls. tube	SB-111	...	C70600	H55
(23) 41	...	Smls. pipe & tube	SB-466	...	C70600	H55
42	...	Wld. tube	SB-543	...	C70600	WC55
43	...	Finned wld. tube	SB-956	...	C70600	WC55
44	...	Wld. pipe	SB-467	...	C70600	Wld. fr. cold rld. strip
45	...	Smls. pipe & tube	SB-466	...	C70620	O60

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	32	50	18	NP	300 (Cl. 3 only)	450	450	NFC-2	G5, T3
2	...	32	50	18	NP	NP	450	450	NFC-2	G14, T3, W11
3	...	32	50	18	NP	NP	450	450	NFC-2	G5, G14, T3, W11
4	...	34	38	12	NP	150 (Cl. 3 only)	150	150	NFC-2	...
5	...	34	38	12	NP	NP	150	150	NFC-2	G14, W11
6	...	34	40	30	NP	150 (Cl. 3 only)	150	150	NFC-2	G7, W3
7	...	34	38	13	NP	400	600	600	NFC-3	T6
8	...	34	38	13	NP	400	600	600	NFC-3	G5, T5
9	>4 ¹ / ₂	34	38	13	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G34, T6, W11
10	>4 ¹ / ₂	34	38	13	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, G14, G34, T5, W11
11	All	34	38	15	NP	200	NP	NP	NFC-3	...
12	All	34	38	15	NP	200	NP	NP	NFC-3	G5
13	≤5	34	40	15	NP	400	NP	NP	NFC-3	...
14	≤5	34	40	15	NP	400	NP	NP	NFC-3	G5
15	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	...
16	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	G5
17	≤5	34	40	15	NP	NP	600	600	NFC-3	T5
18	≤5	34	40	15	NP	NP	600	600	NFC-3	G5, T5
19	≤5	34	40	15	NP	400	NP	NP	NFC-3	...
20	≤5	34	40	15	NP	400	NP	NP	NFC-3	G5
21	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	...
22	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	G5
23	≤5	34	40	15	NP	NP	600	600	NFC-3	T5
24	≤5	34	40	15	NP	NP	600	600	NFC-3	G5, T5
25	...	34	40	15	600	400	NP	NP	NFC-3	G1, T5
26	...	34	40	15	600	400	NP	NP	NFC-3	G1, G5, T5
27	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	T5
28	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, T5
29	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G1, T5
30	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G1, G5, T5
31	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	T5
32	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, T5
33	≤4 ¹ / ₂	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G34, T5, W11
34	≤4 ¹ / ₂	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, G14, G34, T5, W11
35	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G34, T5, W11
36	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, G14, G34, T5, W11
37	...	34	40	15	NP	NP	600	NP	NFC-3	G14, G34, T5, W11
38	...	34	40	15	NP	NP	600	NP	NFC-3	G5, G14, G34, T5, W11
39	≤4 ¹ / ₂	34	45	30	NP	NP	600	600	NFC-3	G14, G34, T5, W11
40	...	34	45	35	NP	450 (Cl. 3 only)	600	600	NFC-3	G33, T5, W3
41	...	34	45	35	NP	NP	600	600	NFC-3	G33, T5, W3
42	...	34	45	35	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G33, G34, T5, W10
43	...	34	45	35	NP	NP	600	NP	NFC-3	G14, G33, G34, T5, W10
44	≤4 ¹ / ₂	34	54	45	NP	NP	600	600	NFC-3	G14, G34, T5, W11
45	...	34	38	13	NP	400	600	600	NFC-3	T6

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	12.0	12.0	12.0	12.0	12.0	6.5	3.3	1.8	...	...	...	...	...	...	...	...	...	...
2	10.2	10.1	10.0	9.9	9.9	5.5	2.7	1.4	...	...	...	...	...	...	...	...	...	...
3	10.2	10.2	10.2	10.2	10.2	5.5	2.7	1.4	...	...	...	...	...	...	...	...	...	...
4	8.0	8.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	6.8	6.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	11.4	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	8.7	8.4	8.2	8.0	7.8	7.7	7.5	7.4	7.3	7.0	6.0	...	...	...	...	...	...	...
8	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.0	7.0	6.0	...	...	...	...	...	...	...
9	7.4	7.2	7.0	6.8	6.7	6.5	6.4	6.3	6.2	5.7	4.3	...	...	...	...	...	...	...
10	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	6.3	5.7	4.3	...	...	...	...	...	...	...
11	10.0	9.7	9.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	10.0	9.7	9.5	9.3	9.0	8.8	8.7	...	...	...	...	...	...	...	...	...	...	...
14	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
15	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...	...	...	...
16	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...
17	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
18	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
19	10.0	9.7	9.5	9.3	9.0	8.8	8.7	...	...	...	...	...	...	...	...	...	...	...
20	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
21	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...	...	...	...
22	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...
23	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
24	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
25	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
26	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
27	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
28	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
29	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
30	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
31	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
32	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
33	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
34	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.3	5.7	4.3	...	...	...	...	...	...	...
35	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
36	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.3	5.7	4.3	...	...	...	...	...	...	...
37	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
38	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.3	5.7	4.3	...	...	...	...	...	...	...
39	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
40	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
41	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
42	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
43	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
44	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
45	8.7	8.4	8.2	8.0	7.8	7.7	7.5	7.4	7.3	7.0	6.0	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	...	Smls. pipe & tube	SB-466	...	C70620	O60
2	...	Wld. pipe	SB-467	...	C70620	W061
3	...	Wld. pipe	SB-467	...	C70620	W061
4	...	Bar, rod	SB-151	...	C70620	O60
5	...	Bar, rod	SB-151	...	C70620	O60
6	...	Forgings	SB-283	...	C70620	M10
7	...	Forgings	SB-283	...	C70620	M10
8	...	Plate	SB-171	...	C70620	M10, M20
9	...	Plate	SB-171	...	C70620	M10, M20
10	...	Plate, sheet	SB-171	...	C70620	M10, M20
11	...	Plate, sheet	SB-171	...	C70620	M10, M20
12	...	Plate	SB-171	...	C70620	M10, M20
13	...	Plate	SB-171	...	C70620	M10, M20
14	...	Forgings	SB-283	...	C70620	O20
15	...	Forgings	SB-283	...	C70620	O20
16	...	Plate	SB-171	...	C70620	O20, O25
17	...	Plate	SB-171	...	C70620	O20, O25
18	...	Plate, sheet	SB-171	...	C70620	O20, O25
19	...	Plate, sheet	SB-171	...	C70620	O20, O25
20	...	Plate	SB-171	...	C70620	O20, O25
21	...	Plate	SB-171	...	C70620	O20, O25
22	...	Smls. cond. tube	SB-111	...	C70620	O61
23	...	Smls. cond. tube	SB-111	...	C70620	O61
24	...	Smls. cond. tube	SB-111	...	C70620	O61
25	...	Smls. cond. tube	SB-111	...	C70620	O61
(23) 26	...	Finned tube	SB-359	...	C70620	O61
(23) 27	...	Finned tube	SB-359	...	C70620	O61
28	...	Smls. U-bend tube	SB-395	...	C70620	O61
29	...	Smls. U-bend tube	SB-395	...	C70620	O61
30	...	Wld. pipe	SB-467	...	C70620	W061
31	...	Wld. pipe	SB-467	...	C70620	W061
32	...	Wld. tube	SB-543	...	C70620	W061
33	...	Wld. tube	SB-543	...	C70620	W061
34	...	Finned wld. tube	SB-956	...	C70620	W061
35	...	Finned wld. tube	SB-956	...	C70620	W061
36	...	Forgings	SB-283	...	C70620	M10
37	...	Forgings	SB-283	...	C70620	M10
38	...	Wld. pipe	SB-467	...	C70620	WM50
39	...	Smls. tube	SB-111	...	C70620	H55
(23) 40	...	Smls. pipe & tube	SB-466	...	C70620	H55
41	...	Wld. tube	SB-543	...	C70620	WC55
42	...	Finned wld. tube	SB-956	...	C70620	WC55
43	...	Wld. pipe	SB-467	...	C70620	Wld. fr. cold rld. strip
(23) 44	...	Smls. tube	SB-466	...	C71000	O60
(23) 45	...	Smls. tube	SB-466	...	C71000	O60

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	34	38	13	NP	400	600	600	NFC-3	G5, T5
2	>4 ¹ / ₂	34	38	13	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G34, T6, W11
3	>4 ¹ / ₂	34	38	13	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, G14, G34, T5, W11
4	All	34	38	15	NP	200	NP	NP	NFC-3	...
5	All	34	38	15	NP	200	NP	NP	NFC-3	G5
6	>6	34	40	15	NP	NP	600	600	NFC-3	T5
7	>6	34	40	15	NP	NP	600	600	NFC-3	G5, T5
8	≤5	34	40	15	NP	400	NP	NP	NFC-3	...
9	≤5	34	40	15	NP	400	NP	NP	NFC-3	G5
10	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	...
11	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	G5
12	≤5	34	40	15	NP	NP	600	600	NFC-3	T5
13	≤5	34	40	15	NP	NP	600	600	NFC-3	G5, T5
14	...	34	40	15	NP	NP	600	600	NFC-3	T5
15	...	34	40	15	NP	NP	600	600	NFC-3	G5, T5
16	≤5	34	40	15	NP	400	NP	NP	NFC-3	...
17	≤5	34	40	15	NP	400	NP	NP	NFC-3	G5
18	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	...
19	≤5	34	40	15	NP	450 (Cl. 3 only)	NP	NP	NFC-3	G5
20	≤5	34	40	15	NP	NP	600	600	NFC-3	T5
21	≤5	34	40	15	NP	NP	600	600	NFC-3	G5, T5
22	...	34	40	15	600	400	NP	NP	NFC-3	G1, T5
23	...	34	40	15	600	400	NP	NP	NFC-3	G1, G5, T5
24	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	T5
25	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, T5
26	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G1, T5
27	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G1, G5, T5
28	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	T5
29	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, T5
30	≤4 ¹ / ₂	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G34, T5, W11
31	≤4 ¹ / ₂	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, G14, G34, T5, W11
32	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G34, T5, W11
33	...	34	40	15	NP	450 (Cl. 3 only)	600	600	NFC-3	G5, G14, G34, T5, W11
34	...	34	40	15	NP	NP	600	NP	NFC-3	G14, G34, T5, W11
35	...	34	40	15	NP	NP	600	NP	NFC-3	G5, G14, G34, T5, W11
36	≤6	34	45	18	NP	NP	600	600	NFC-3	G34, T5
37	≤6	34	45	18	NP	NP	600	600	NFC-3	G5, G34, T5
38	≤4 ¹ / ₂	34	45	30	NP	NP	600	600	NFC-3	G14, G34, T5, W11
39	...	34	45	35	NP	450 (Cl. 3 only)	600	600	NFC-3	G33, T5, W3
40	...	34	45	35	NP	NP	600	600	NFC-3	G33, T5, W3
41	...	34	45	35	NP	450 (Cl. 3 only)	600	600	NFC-3	G14, G33, G34, T5, W10
42	...	34	45	35	NP	NP	600	NP	NFC-3	G14, G33, G34, T5, W10
43	≤4 ¹ / ₂	34	54	45	NP	NP	600	600	NFC-3	G14, G34, T5, W11
44	...	34	45	16	NP	700 (Cl. 3 only)	700	650	NFC-3	T7
45	...	34	45	16	NP	700 (Cl. 3 only)	700	650	NFC-3	G5, T7

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.0	7.0	6.0	...	...	...	...	...	...	...
2	7.4	7.2	7.0	6.8	6.7	6.5	6.4	6.3	6.2	5.7	4.3	...	...	...	...	...	...	...
3	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	6.3	5.7	4.3	...	...	...	...	...	...	...
4	10.0	9.7	9.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
7	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
8	10.0	9.7	9.5	9.3	9.0	8.8	8.7	...	...	...	...	...	...	...	...	...	...	...
9	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
10	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...	...	...	...
11	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...
12	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
13	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
14	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
15	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
16	10.0	9.7	9.5	9.3	9.0	8.8	8.7	...	...	...	...	...	...	...	...	...	...	...
17	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
18	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...	...	...	...
19	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...
20	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
21	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
22	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
23	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
24	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
25	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
26	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
27	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
28	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
29	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...	...
30	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
31	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.3	5.7	4.3	...	...	...	...	...	...	...
32	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
33	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.3	5.7	4.3	...	...	...	...	...	...	...
34	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
35	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.3	5.7	4.3	...	...	...	...	...	...	...
36	12.0	11.7	11.4	11.1	10.9	10.6	10.4	10.2	8.0	7.0	6.0	...	...	...	...	...	...	...
37	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.8	8.0	7.0	6.0	...	...	...	...	...	...	...
38	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
39	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
40	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.0	7.0	6.0	...	...	...	...	...	...	...
41	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
42	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
43	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2	6.3	5.7	4.3	...	...	...	...	...	...	...
44	10.7	10.4	10.2	10.0	9.7	9.4	9.2	8.9	8.7	8.5	8.4	7.7	7.0	...	...	...	...	...
45	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	8.4	7.7	7.0	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
(23) 1	...	Smls. cond. tube	SB-111	...	C71000	O61
(23) 2	...	Smls. cond. tube	SB-111	...	C71000	O61
(23) 3	...	Finned tube	SB-359	...	C71000	O61
(23) 4	...	Finned tube	SB-359	...	C71000	O61
(23) 5	...	Smls. tube	SB-395	...	C71000	O61
(23) 6	...	Smls. tube	SB-395	...	C71000	O61
7	...	Wld. pipe	SB-467	...	C71500	W061
8	...	Wld. pipe	SB-467	...	C71500	W061
9	...	Plate, sheet	SB-171	...	C71500	M10, M20
10	...	Plate, sheet	SB-171	...	C71500	M10, M20
11	...	Plate, sheet	SB-171	...	C71500	O20, O25
12	...	Plate, sheet	SB-171	...	C71500	O20, O25
13	...	Plate, sheet	SB-171	...	C71500	M10, M20
14	...	Plate, sheet	SB-171	...	C71500	M10, M20
15	...	Plate, sheet	SB-171	...	C71500	O20, O25
16	...	Plate, sheet	SB-171	...	C71500	O20, O25
17	...	Wld. pipe	SB-467	...	C71500	W061
18	...	Wld. pipe	SB-467	...	C71500	W061
19	...	Smls. pipe & tube	SB-466	...	C71500	O60
20	...	Smls. pipe & tube	SB-466	...	C71500	O60
21	...	Smls. cond. tube	SB-111	...	C71500	O61
22	...	Smls. cond. tube	SB-111	...	C71500	O61
23	...	Finned tube	SB-359	...	C71500	O61
24	...	Finned tube	SB-359	...	C71500	O61
25	...	Smls. U-bend tube	SB-395	...	C71500	O61
26	...	Smls. U-bend tube	SB-395	...	C71500	O61
27	...	Wld. cond. tube	SB-543	...	C71500	W061
28	...	Wld. cond. tube	SB-543	...	C71500	W061
29	...	Finned wld. cond. tube	SB-956	...	C71500	W061
30	...	Finned wld. cond. tube	SB-956	...	C71500	W061
(23) 31	...	Smls. cond. tube	SB-111	...	C71500	HR50
(23) 32	...	Smls. U-bend tube	SB-395	...	C71500	HR50
33	...	Wld. pipe	SB-467	...	C71520	W061
34	...	Wld. pipe	SB-467	...	C71520	W061
35	...	Forgings	SB-283	...	C71520	M10
36	...	Forgings	SB-283	...	C71520	M10
37	...	Plate, sheet	SB-171	...	C71520	M10, M20
38	...	Plate, sheet	SB-171	...	C71520	M10, M20
39	...	Forgings	SB-283	...	C71520	O20
40	...	Forgings	SB-283	...	C71520	O20
41	...	Plate, sheet	SB-171	...	C71520	O20, O25
42	...	Plate, sheet	SB-171	...	C71520	O20, O25
43	...	Forgings	SB-283	...	C71520	M10
44	...	Forgings	SB-283	...	C71520	M10
45	...	Plate, sheet	SB-171	...	C71520	M10, M20

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	34	45	16	700	700 (Cl. 3 only)	700	650	NFC-3	T7
2	...	34	45	16	700	700 (Cl. 3 only)	700	650	NFC-3	G5, T7
3	...	34	45	16	NP	700 (Cl. 3 only)	700	NP	NFC-3	T7
4	...	34	45	16	NP	700 (Cl. 3 only)	700	NP	NFC-3	G5, T7
5	...	34	45	16	NP	700 (Cl. 3 only)	700	650	NFC-3	T7
6	...	34	45	16	NP	700 (Cl. 3 only)	700	650	NFC-3	G5, T7
7	$>4\frac{1}{2}$	34	45	15	NP	600 (Cl. 3 only)	NP	NP	NFC-3	G14, W11
8	$>4\frac{1}{2}$	34	45	15	NP	600 (Cl. 3 only)	NP	NP	NFC-3	G5, G14, W11
9	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	...
10	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	G5
11	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	...
12	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	G5
13	≤ 2.5	34	50	20	NP	700	700	650	NFC-4	...
14	≤ 2.5	34	50	20	NP	700	700	650	NFC-4	G5
15	≤ 2.5	34	50	20	NP	700	700	650	NFC-4	...
16	≤ 2.5	34	50	20	NP	700	700	650	NFC-4	G5
17	$\leq 4\frac{1}{2}$	34	50	20	NP	600 (Cl. 3 only)	NP	NP	NFC-4	G14
18	$\leq 4\frac{1}{2}$	34	50	20	NP	600 (Cl. 3 only)	NP	NP	NFC-4	G5, G14
19	...	34	52	18	NP	700	700	650	NFC-4	...
20	...	34	52	18	NP	700	700	650	NFC-4	G5
21	...	34	52	18	700	700	700	650	NFC-4	G1
22	...	34	52	18	700	700	700	650	NFC-4	G1, G5
23	...	34	52	18	NP	700 (Cl. 3 only)	700	NP	NFC-4	G1
24	...	34	52	18	NP	700 (Cl. 3 only)	700	NP	NFC-4	G1, G5
25	...	34	52	18	NP	700 (Cl. 3 only)	700	650	NFC-4	...
26	...	34	52	18	NP	700 (Cl. 3 only)	700	650	NFC-4	G5
27	...	34	52	18	NP	600 (Cl. 3 only)	600	600	NFC-4	G14, W11
28	...	34	52	18	NP	600 (Cl. 3 only)	600	600	NFC-4	G5, G14, W11
29	...	34	52	18	NP	NP	600	NP	NFC-4	G14, W11
30	...	34	52	18	NP	NP	600	NP	NFC-4	G5, G14, W11
31	...	34	72	50	NP	700	800	650	NFC-4	T9, W3
32	...	34	72	50	NP	700	800	650	NFC-8	T9, W3
33	$>4\frac{1}{2}$	34	45	15	NP	600 (Cl. 3 only)	NP	NP	NFC-3	G14, W11
34	$>4\frac{1}{2}$	34	45	15	NP	600 (Cl. 3 only)	NP	NP	NFC-3	G5, G14, W11
35	>6	34	45	18	NP	NP	700	650	NFC-4	...
36	>6	34	45	18	NP	NP	700	650	NFC-4	G5
37	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	...
38	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	G5
39	...	34	45	18	NP	NP	700	650	NFC-4	...
40	...	34	45	18	NP	NP	700	650	NFC-4	G5
41	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	...
42	$2.5 < t \leq 5$	34	45	18	NP	700	700	650	NFC-4	G5
43	≤ 6	34	50	20	NP	NP	700	650	NFC-4	...
44	≤ 6	34	50	20	NP	NP	700	650	NFC-4	G5
45	≤ 2.5	34	50	20	NP	700	700	650	NFC-4	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	10.7	10.4	10.2	10.0	9.7	9.4	9.2	8.9	8.7	8.5	8.4	7.7	7.0	...	...	...	...	...
2	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	8.4	7.7	7.0	...	...	...	...	...
3	10.7	10.4	10.2	10.0	9.7	9.4	9.2	8.9	8.7	8.5	8.4	7.7	7.0	...	...	...	...	...
4	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	8.4	7.7	7.0	...	...	...	...	...
5	10.7	10.4	10.2	10.0	9.7	9.4	9.2	8.9	8.7	8.5	8.4	7.7	7.0	...	...	...	...	...
6	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	8.4	7.7	7.0	...	...	...	...	...
7	8.5	8.2	8.0	7.8	7.6	7.5	7.3	7.2	7.0	6.9	6.8	...	...	...	...	...	...	...
8	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	...	...	...	...	...	...	...
9	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
10	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
11	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
12	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
13	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	10.4	...	...	...	...	...
14	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...
15	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	10.4	...	...	...	...	...
16	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...
17	11.3	10.9	10.7	10.4	10.2	10.0	9.7	9.6	9.4	9.2	9.1	...	...	...	...	...	...	...
18	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	...	...	...	...	...	...	...
19	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
20	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
21	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
22	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
23	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
24	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
25	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
26	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
27	10.2	9.8	9.6	9.4	9.2	9.0	8.8	8.6	8.4	8.3	8.2	...	...	...	...	...	...	...
28	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	...	...	...	...	...	...	...
29	10.2	9.8	9.6	9.4	9.2	9.0	8.8	8.6	8.4	8.3	8.2	...	...	...	...	...	...	...
30	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	...	...	...	...	...	...	...
31	20.6	20.6	20.6	20.6	20.6	20.3	20.0	19.7	19.4	19.2	18.9	18.7	18.4	18.0	8.5	...	...	...
32	20.6	20.6	20.6	20.6	20.6	20.3	20.0	19.7	19.4	19.2	18.9	18.7	18.4	18.0	8.5	...	...	...
33	8.5	8.2	8.0	7.8	7.6	7.5	7.3	7.2	7.0	6.9	6.8	...	...	...	...	...	...	...
34	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	...	...	...	...	...	...	...
35	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
36	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
37	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
38	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
39	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
40	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
41	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
42	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
43	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	10.4	...	...	...	...	...
44	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...
45	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	10.4	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	...	Plate, sheet	SB-171	...	C71520	M10, M20
2	...	Plate, sheet	SB-171	...	C71520	O20, O25
3	...	Plate, sheet	SB-171	...	C71520	O20, O25
4	...	Wld. pipe	SB-467	...	C71520	W061
5	...	Wld. pipe	SB-467	...	C71520	W061
6	...	Smls. pipe & tube	SB-466	...	C71520	O60
7	...	Smls. pipe & tube	SB-466	...	C71520	O60
8	...	Smls. cond. tube	SB-111	...	C71520	O61
9	...	Smls. cond. tube	SB-111	...	C71520	O61
10	...	Finned tube	SB-359	...	C71520	O61
11	...	Finned tube	SB-359	...	C71520	O61
12	...	Smls. U-bend tube	SB-395	...	C71520	O61
13	...	Smls. U-bend tube	SB-395	...	C71520	O61
14	...	Wld. cond. tube	SB-543	...	C71520	W061
15	...	Wld. cond. tube	SB-543	...	C71520	W061
16	...	Finned wld. cond. tube	SB-956	...	C71520	W061
17	...	Finned wld. cond. tube	SB-956	...	C71520	W061
(23) 18	...	Smls. cond. tube	SB-111	...	C71520	HR50
(23) 19	...	Smls. U-bend tube	SB-395	...	C71520	HR50
20	...	Smls. cond. tube	SB-111	...	C72200	O61
21	...	Castings	SB-62	...	C83600	M01
22	...	Castings	SB-62	...	C83600	M01
23	...	Castings	SB-61	...	C92200	M01
(23) 24	...	Castings	SB-61	...	C92200	M01
25	...	Castings	SB-584	...	C92200	M01
(23) 26	...	Castings	SB-584	...	C92200	M01
27	...	Castings	SB-584	...	C93700	M01
28	...	Castings	SB-584	...	C93700	M01
29	...	Castings	SB-148	...	C95200	M01
30	...	Castings	SB-271	...	C95200	M02
31	...	Castings	SB-505	...	C95200	M07
32	...	Castings	SB-148	...	C95400	M01
33	...	Castings	SB-271	...	C95400	M02
(23) 34	...	Castings	SB-148	...	C95800	M01
(23) 35	...	Castings	SB-148	...	C95820	M01
36	...	Castings	SB-369	...	C96200	M01
37	...	Castings	SB-584	...	C97600	M01
38	...	Castings	SB-584	...	C97600	M01
39	99Ni	Smls. pipe & tube	SB-161	...	N02200	Annealed
40	99Ni	Smls. & wld. fittings	SB-366	...	N02200	Annealed
41	99Ni	Bar, rod	SB-160	...	N02200	Annealed
42	99Ni	Smls. pipe & tube	SB-161	...	N02200	Annealed
43	99Ni	Plate, sheet, strip	SB-162	...	N02200	Annealed
44	99Ni	Smls. tube	SB-163	...	N02200	Annealed
45	99Ni	Plate, sheet, strip	SB-162	...	N02200	As rolled

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	≤2.5	34	50	20	NP	700	700	650	NFC-4	G5
2	≤2.5	34	50	20	NP	700	700	650	NFC-4	...
3	≤2.5	34	50	20	NP	700	700	650	NFC-4	G5
4	≤4 ¹ / ₂	34	50	20	NP	600 (Cl. 3 only)	NP	NP	NFC-4	G14
5	≤4 ¹ / ₂	34	50	20	NP	600 (Cl. 3 only)	NP	NP	NFC-4	G5, G14
6	...	34	52	18	NP	700	700	650	NFC-4	...
7	...	34	52	18	NP	700	700	650	NFC-4	G5
8	...	34	52	18	700	700	700	650	NFC-4	G1
9	...	34	52	18	700	700	700	650	NFC-4	G1, G5
10	...	34	52	18	NP	700 (Cl. 3 only)	700	NP	NFC-4	G1
11	...	34	52	18	NP	700 (Cl. 3 only)	700	NP	NFC-4	G1, G5
12	...	34	52	18	NP	700 (Cl. 3 only)	700	650	NFC-4	...
13	...	34	52	18	NP	700 (Cl. 3 only)	700	650	NFC-4	G5
14	...	34	52	18	NP	600 (Cl. 3 only)	600	600	NFC-4	G14, W11
15	...	34	52	18	NP	600 (Cl. 3 only)	600	600	NFC-4	G5, G14, W11
16	...	34	52	18	NP	NP	600	NP	NFC-4	G14, W11
17	...	34	52	18	NP	NP	600	NP	NFC-4	G5, G14, W11
18	...	34	72	50	NP	700	800	650	NFC-4	T9, W3
19	...	34	72	50	NP	700	800	650	NFC-8	T9, W3
20	...	34	45	16	NP	NP	150	150	NFC-3	...
21	...	...	30	14	450	450 (Cl. 3 only)	450	450	NFC-1	G1, G3, G15, W10, W14
22	...	...	30	14	450	450 (Cl. 3 only)	450	450	NFC-1	G1, G3, G5, G15, T19, W10, W14
23	...	...	34	16	550	500 (Cl. 3 only)	550	550	NFN-1	G1, G3, G15, T5, W14
24	...	...	34	16	550	500 (Cl. 3 only)	550	550	NFN-1	G1, G3, G5, G15, T5, W8
25	...	...	34	16	NP	500 (Cl. 3 only)	550	550	NFN-1	G15, T5
26	...	...	34	16	NP	500 (Cl. 3 only)	550	550	NFN-1	G5, G15, T5
27	...	...	30	12	NP	400 (SPT)	400	400	NFC-1	G15, W8
28	...	...	30	12	NP	400 (SPT)	400	400	NFC-1	G5, G15, W8
29	...	35	65	25	550	500 (Cl. 3 only)	600	600	NFC-4	G15, T6
30	...	35	65	25	NP	500 (Cl. 3 only)	600	600	NFC-4	G15, T6
31	...	35	68	26	NP	500 (Cl. 3 only)	NP	NP	NFC-4	G15
32	...	35	75	30	550	400 (Cl. 3 only)	600	600	NFC-4	G15, T19
33	...	35	75	30	NP	400 (Cl. 3 only)	NP	NP	NFC-4	G15
34	...	35	85	35	NP	400 (Cl. 3 only)	NP	400	NFC-4	G15
35	...	35	94	39	NP	NP	400	400	NFC-4	G15
36	...	34	45	25	NP	200 (Cl. 3 only)	NP	NP	NFC-4	G15
37	...	...	40	17	NP	NP	300	300	NFC-1	G15, W8
38	...	...	40	17	NP	NP	300	300	NFC-1	G5, G15, W8
39	>5 O.D.	41	55	12	NP	600 (Cl. 3 only)	600	600	NFN-2	...
40	...	41	55	12	NP	NP	600	600	NFN-2	W12
41	...	41	55	15	NP	600 (Cl. 3 only)	600	600	NFN-2	...
42	≤5 O.D.	41	55	15	NP	600 (Cl. 3 only)	600	600	NFN-2	...
43	...	41	55	15	NP	600 (Cl. 3 only)	600	600	NFN-2	...
44	...	41	55	15	NP	600 (Cl. 3 only)	600	600	NFN-2	...
45	...	41	55	20	NP	600 (Cl. 3 only)	600	600	NFN-2	G20

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...
2	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	10.4	...	...	...	...	...
3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...
4	11.3	10.9	10.7	10.4	10.2	10.0	9.7	9.6	9.4	9.2	9.1	...	...	...	...	...	...	...
5	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	...	...	...	...	...	...	...
6	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
7	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
8	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
9	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
10	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
11	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
12	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	9.4	...	...	...	...	...
13	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...
14	10.2	9.8	9.6	9.4	9.2	9.0	8.8	8.6	8.4	8.3	8.2	...	...	...	...	...	...	...
15	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	...	...	...	...	...	...	...
16	10.2	9.8	9.6	9.4	9.2	9.0	8.8	8.6	8.4	8.3	8.2	...	...	...	...	...	...	...
17	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	...	...	...	...	...	...	...
18	20.6	20.6	20.6	20.6	20.6	20.3	20.0	19.7	19.4	19.2	18.9	18.7	18.4	18.0	8.5	...	...	...
19	20.6	20.6	20.6	20.6	20.6	20.3	20.0	19.7	19.4	19.2	18.9	18.7	18.4	18.0	8.5	...	...	...
20	10.7	10.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	8.6	8.6	8.4	8.1	7.8	7.6	7.3	7.0	...	...	...	...	...	...	...	...	...	...
22	8.6	8.6	8.6	8.5	8.4	8.2	8.1	7.5	...	...	...	...	...	...	...	...	...	...
23	9.7	9.7	9.6	9.2	9.0	8.9	8.8	8.7	7.4	5.0	...	...	...	...	...	...	...	...
24	9.7	9.7	9.7	9.7	9.7	9.7	9.5	9.1	7.4	5.0	...	...	...	...	...	...	...	...
25	9.7	9.7	9.6	9.2	9.0	8.9	8.8	8.7	7.4	5.0	...	...	...	...	...	...	...	...
26	9.7	9.7	9.7	9.7	9.7	9.7	9.5	9.1	7.4	5.0	...	...	...	...	...	...	...	...
27	8.0	7.4	7.1	7.0	6.8	6.7	...	...	...	...	...	...	...	...	...	...	...	...
28	8.0	8.0	8.0	8.0	7.9	7.7	7.4	...	...	...	...	...	...	...	...	...	...	...
29	16.7	15.7	15.2	14.8	14.5	14.3	14.2	14.2	14.2	11.7	7.4	...	...	...	...	...	...	...
30	16.7	15.7	15.2	14.8	14.5	14.3	14.2	14.2	14.2	11.7	7.4	...	...	...	...	...	...	...
31	17.3	16.3	15.8	15.4	15.1	14.9	14.8	14.7	14.7	...	...	...	...	...	...	...	...	...
32	20.0	19.6	19.5	19.4	19.3	19.3	19.3	16.0	13.9	11.0	8.5	...	...	...	...	...	...	...
33	20.0	19.6	19.5	19.4	19.3	19.3	19.3	...	...	...	...	...	...	...	...	...	...	...
34	23.3	23.0	22.9	22.8	22.7	22.4	21.9	...	...	...	...	...	...	...	...	...	...	...
35	26.0	25.6	25.5	25.4	25.3	24.8	24.3	...	...	...	...	...	...	...	...	...	...	...
36	12.9	12.9	12.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	11.3	10.2	9.6	9.1	8.7	...	...	...	...	...	...	...	...	...	...	...	...	...
38	11.3	11.3	11.3	11.1	11.0	...	...	...	...	...	...	...	...	...	...	...	...	...
39	8.0	...	8.0	...	8.0	...	8.0	...	8.0	...	8.0	...	...	...	...	...	...	...
40	8.0	...	8.0	...	8.0	...	8.0	...	8.0	...	8.0	...	...	...	...	...	...	...
41	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...	...	...	...
42	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...	...	...	...
43	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...	...	...	...
44	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...	...	...	...
45	13.3	...	13.3	...	13.3	...	13.3	...	12.6	...	11.5	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	99Ni	Bar, rod	SB-160	...	N02200	Hot rolled
2	99Ni	Smls. pipe & tube	SB-161	...	N02200	Stress rel.
3	99Ni	Smls. tube	SB-163	...	N02200	Stress rel.
4	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed
(23) 5	99Ni-Low C	Smls. & wld. fittings	SB-366	...	N02201	Annealed
6	99Ni-Low C	Bar, rod	SB-160	...	N02201	Hot rolled/ann.
7	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed
8	99Ni-Low C	Smls. tube	SB-163	...	N02201	Annealed
9	99Ni-Low C	Plate, sheet, strip	SB-162	...	N02201	Hot rolled/ann.
10	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Stress rel.
11	99Ni-Low C	Smls. pipe & tube	SB-163	...	N02201	Stress rel.
(23) 12	67Ni-30Cu	Bar, rod	SB-164	...	N04400	HW or CW ann.
13	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed
14	67Ni-30Cu	Forgings	SB-564	...	N04400	Annealed
15	67Ni-30Cu	Plate	SB-127	...	N04400	Annealed
16	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Annealed
17	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed
(23) 18	67Ni-30Cu	Smls. & wld. fittings	SB-366	...	N04400	Annealed
(23) 19	67Ni-30Cu	Hexagons, rings, discs	SB-164	...	N04400	Hot worked
20	67Ni-30Cu	Plate	SB-127	...	N04400	As rolled
(23) 21	67Ni-30Cu	Rounds, squares, rectangles	SB-164	...	N04400	Hot worked
(23) 22	67Ni-30Cu	Rounds, squares, rectangles	SB-164	...	N04400	Hot worked
(23) 23	67Ni-30Cu	Hexagon	SB-164	...	N04400	Hot worked
24	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Stress rel.
25	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Stress rel.
26	67Ni-30Cu-S	Bar	SB-164	...	N04405	Annealed
27	67Ni-30Cu-S	Bar	SB-164	...	N04405	Hot worked
28	47Ni-22Cr-9Mo-18Fe	Plate, sheet, strip	SB-435	...	N06002	Annealed
29	47Ni-22Cr-9Mo-18Fe	Plate, sheet, strip	SB-435	...	N06002	Annealed
30	47Ni-22Cr-9Mo-18Fe	Rod	SB-572	...	N06002	Annealed
31	47Ni-22Cr-9Mo-18Fe	Rod	SB-572	...	N06002	Annealed
(23) 32	47Ni-22Cr-9Mo-18Fe	Smls. & wld. fittings	SB-366	...	N06002	Annealed
33	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.
34	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.
35	47Ni-22Cr-9Mo-18Fe	Smls. pipe & tube	SB-622	...	N06002	Solution ann.
36	47Ni-22Cr-9Mo-18Fe	Smls. pipe & tube	SB-622	...	N06002	Solution ann.
37	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.
38	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.
39	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
40	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
41	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
42	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
43	47Ni-22Cr-19Fe-6Mo	Smls. & wld. fittings	SB-366	...	N06007	Annealed
44	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
45	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	41	60	15	NP	600 (Cl. 3 only)	600	600	NFN-2	...
2	...	41	65	40	NP	600 (Cl. 3 only)	600	600	NFN-25	G29
3	...	41	65	40	NP	600 (Cl. 3 only)	600	600	NFN-25	G29
4	>5 O.D.	41	50	10	NP	800 (Cl. 3 only)	1200	650	NFN-1	T10
5	...	41	50	10	800 (Cl. 3 only)	NP	1150	650	NFN-1	T10, W5, W12
6	...	41	50	10	NP	800 (Cl. 3 only)	1200	650	NFN-1	T10
7	≤5 O.D.	41	50	12	NP	800 (Cl. 3 only)	1200	650	NFN-1	T9
8	...	41	50	12	NP	800 (Cl. 3 only)	1200	650	NFN-1	T9
9	...	41	50	12	NP	800 (Cl. 3 only)	1200	650	NFN-1	T9
10	...	41	60	30	NP	600 (Cl. 3 only)	600	600	NFN-1	...
11	...	41	60	30	NP	800 (Cl. 3 only)	900	650	NFN-1	...
12	All	42	70	25	NP	800	900	650	NFN-3	T10
13	>5 O.D.	42	70	25	NP	800	900	650	NFN-3	T10
14	...	42	70	25	NP	800	900	650	NFN-3	T10
15	...	42	70	28	NP	800	900	650	NFN-3	T10
16	≤3	42	70	28	NP	800	900	650	NFN-3	T10
17	≤5 O.D.	42	70	28	NP	800	900	650	NFN-3	T10
18	...	42	70	28	NP	800	900	650	NFN-3	T10, W5, W12
19	$2\frac{1}{8} < t \leq 4$	42	75	30	NP	800	900	650	NFN-3	T9
20	...	42	75	40	NP	800	900	650	NFN-3	G12, G20, T9
21	$12 < t \leq 14$	42	75	40	NP	NP	900	650	NFN-3	T9
22	≤12	42	80	40	NP	800 (Cl. 3 only)	900	650	NFN-3	T9
23	≤ $2\frac{1}{8}$	42	80	40	NP	800 (Cl. 3 only)	900	650	NFC-3	T9
24	...	42	85	55	NP	800	800	650	NFN-3	G11, T8
25	...	42	85	55	NP	800	500	500	NFN-3	G5, G21, T8
26	...	42	70	25	NP	800	900	650	NFN-3	T10
27	...	42	75	35	NP	800	900	650	NFN-3	T10
28	...	43	95	35	NP	800	1650	650	NFN-15	G4, G5, T15
29	...	43	95	35	NP	NP	1650	650	NFN-15	G4, T16
30	...	43	95	35	NP	800	1650	650	NFN-15	G4, G5, G13, T15
31	...	43	95	35	NP	NP	1650	650	NFN-15	G4, G13, T16
32	...	43	100	40	NP	800	1650	650	NFN-15	G4, G5, T15, W5, W12
33	...	43	100	40	NP	800	1650	650	NFN-15	G4, G5, G14, T14, W5
34	...	43	100	40	NP	NP	1650	650	NFN-15	G4, G14, T16
35	...	43	100	40	NP	800	1650	650	NFN-15	G4, G5, T14
36	...	43	100	40	NP	NP	1650	650	NFN-15	G4, T16
37	...	43	100	40	NP	800	1650	650	NFN-15	G4, G5, G14, T14, W5
38	...	43	100	40	NP	NP	1650	650	NFN-15	G4, G14, T16
39	> $\frac{3}{4}$	45	85	30	NP	NP	1000	650	NFN-11	...
40	> $\frac{3}{4}$	45	85	30	NP	NP	1000	650	NFN-11	G5
41	> $\frac{3}{4}$	45	85	30	NP	NP	1000	650	NFN-11	...
42	> $\frac{3}{4}$	45	85	30	NP	NP	1000	650	NFN-11	G5
43	...	45	90	35	NP	NP	1000	650	NFN-11	G5, W12
44	≤ $\frac{3}{4}$	45	90	35	NP	NP	1000	650	NFN-11	...
45	≤ $\frac{3}{4}$	45	90	35	NP	NP	1000	650	NFN-11	G5

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...	...	...	...
2	18.6	...	18.6	...	18.6	...	18.6	...	18.3	...	17.7	...	...	...	...	...	...	...
3	18.6	...	18.6	...	18.6	...	18.6	...	18.3	...	17.7	...	...	...	...	...	...	...
4	6.7	...	6.4	...	6.3	...	6.2	...	6.2	...	6.2	6.2	6.2	6.1	6.0	5.8	4.5	3.7
5	6.7	...	6.4	...	6.3	...	6.2	...	6.2	...	6.2	6.2	6.2	6.1	6.0	5.8	4.5	3.7
6	6.7	...	6.4	...	6.3	...	6.2	...	6.2	...	6.2	6.2	6.2	6.1	6.0	5.8	4.5	3.7
7	8.0	...	7.7	...	7.5	...	7.5	...	7.5	...	7.5	7.5	7.4	7.4	7.2	5.8	4.5	3.7
8	8.0	...	7.7	...	7.5	...	7.5	...	7.5	...	7.5	7.5	7.4	7.4	7.2	5.8	4.5	3.7
9	8.0	...	7.7	...	7.5	...	7.5	...	7.5	...	7.5	7.5	7.4	7.4	7.2	5.8	4.5	3.7
10	17.1	...	17.1	...	17.0	...	17.0	...	16.8	...	16.3	...	...	...	...	...	...	...
11	17.1	...	17.1	...	17.0	...	17.0	...	16.8	...	16.3	14.0	13.4	12.8	12.1	11.7	11.1	...
12	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.0	12.9	12.7	11.0	8.0	...
13	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.0	12.9	12.7	11.0	8.0	...
14	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.0	12.9	12.7	11.0	8.0	...
15	18.7	...	16.4	...	15.2	...	14.7	...	14.7	...	14.7	14.7	14.6	14.5	14.3	11.0	8.0	...
16	18.7	...	16.4	...	15.2	...	14.7	...	14.7	...	14.7	14.7	14.6	14.5	14.3	11.0	8.0	...
17	18.7	...	16.4	...	15.2	...	14.7	...	14.7	...	14.7	14.7	14.6	14.5	14.3	11.0	8.0	...
18	18.7	...	16.4	...	15.2	...	14.7	...	14.7	...	14.7	14.7	14.6	14.5	14.3	11.0	8.0	...
19	20.0	...	19.4	...	18.6	...	17.9	...	17.6	...	17.3	17.2	17.0	16.8	14.5	8.5	4.0	...
20	21.4	...	21.4	...	21.4	...	21.4	...	21.4	...	21.4	21.4	20.7	18.5	14.5	8.5	4.0	...
21	21.4	...	21.4	...	21.4	...	21.4	...	21.4	...	21.4	21.4	20.7	18.5	14.5	8.5	4.0	...
22	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.8	22.0	18.5	14.5	8.5	4.0	...
23	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.8	22.0	18.5	14.5	8.5	4.0	...
24	24.3	...	24.3	...	24.3	...	24.3	...	24.3	...	23.9	23.5	22.8	18.0	12.7	...	...	...
25	24.3	...	24.3	...	24.3	...	24.3	...	24.3	...	23.9	23.5	22.8	18.0	12.7	...	...	...
26	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.0	12.9	12.7	11.0	8.0	...
27	21.4	...	21.4	...	21.4	...	20.9	...	20.5	...	20.2	20.1	19.8	18.5	14.5	8.5	4.0	...
28	23.3	...	23.3	...	23.3	...	23.3	...	22.3	...	21.2	20.7	20.3	20.1	19.9	19.7	19.6	19.5
29	23.3	...	21.0	...	19.2	...	17.7	...	16.5	...	15.7	15.3	15.1	14.9	14.7	14.6	14.5	14.4
30	23.3	...	23.3	...	23.3	...	23.3	...	22.3	...	21.2	20.7	20.3	20.1	19.9	19.7	19.6	19.5
31	23.3	...	21.0	...	19.2	...	17.7	...	16.5	...	15.7	15.3	15.1	14.9	14.7	14.6	14.5	14.4
32	26.7	...	26.7	...	26.7	...	26.7	...	25.5	...	24.2	...	23.3	...	22.7	...	22.4	...
33	22.7	...	22.7	...	22.7	...	22.7	...	21.7	...	20.5	20.1	19.8	19.5	19.3	19.1	19.0	18.9
34	22.7	...	20.4	...	18.7	...	17.2	...	16.1	...	15.2	14.9	14.6	14.4	14.3	14.2	14.1	14.0
35	26.7	...	26.7	...	26.7	...	26.7	...	25.5	...	24.2	23.7	23.3	22.9	22.7	22.5	22.4	22.2
36	26.7	...	24.0	...	22.0	...	20.3	...	18.9	...	17.9	17.5	17.2	17.0	16.8	16.7	16.6	16.5
37	22.7	...	22.7	...	22.7	...	22.7	...	21.7	...	20.5	20.1	19.8	19.5	19.3	19.1	19.0	18.9
38	22.7	...	20.4	...	18.7	...	17.2	...	16.1	...	15.2	14.9	14.6	14.4	14.3	14.2	14.1	14.0
39	20.0	...	18.0	...	16.7	...	15.7	...	14.9	...	14.4	14.2	14.1	14.0	13.9	13.8	13.7	13.6
40	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	19.5	19.2	19.0	18.8	18.7	18.6	18.5	18.4
41	20.0	...	18.0	...	16.7	...	15.7	...	14.9	...	14.4	14.2	14.1	14.0	13.9	13.8	13.7	13.6
42	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	19.5	19.2	19.0	18.8	18.7	18.6	18.5	18.4
43	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.7	...	22.2	...	21.8	...	21.6	...
44	23.3	...	21.0	...	19.5	...	18.3	...	17.4	...	16.8	16.6	16.4	16.3	16.2	16.1	16.0	15.9
45	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.7	22.4	22.2	22.0	21.8	21.7	21.6	21.5

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...	...	...	...
5	3.0	2.4	2.0	1.5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...	...	...	...
7	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...	...	...	...
8	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...	...	...	...
9	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	19.4	19.3	17.5	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2	...	...	...
29	14.3	14.3	14.2	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2	...	...	...
30	19.4	19.3	17.5	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2	...	...	...
31	14.3	14.3	14.2	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2	...	...	...
32	22.1	...	17.5	...	11.3	...	7.7	...	4.8	...	3.0	...	1.7	1.2	...	...	...
33	18.8	18.5	14.9	12.0	9.6	7.9	6.5	5.2	4.1	3.2	2.6	2.0	1.4	1.0	...	...	...
34	13.9	13.9	13.8	12.0	9.6	7.9	6.5	5.2	4.1	3.2	2.6	2.0	1.4	1.0	...	...	...
35	22.1	21.7	17.5	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2	...	...	...
36	16.4	16.3	16.2	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2	...	...	...
37	18.8	18.5	14.9	12.0	9.6	7.9	6.5	5.2	4.1	3.2	2.6	2.0	1.4	1.0	...	...	...
38	13.9	13.9	13.8	12.0	9.6	7.9	6.5	5.2	4.1	3.2	2.6	2.0	1.4	1.0	...	...	...
39	13.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	18.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	13.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	18.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	21.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	15.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	21.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
2	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
3	47Ni-22Cr-19Fe-6Mo	Wld. pipe	SB-619	...	N06007	Solution ann.
4	47Ni-22Cr-19Fe-6Mo	Wld. pipe	SB-619	...	N06007	Solution ann.
5	47Ni-22Cr-19Fe-6Mo	Smls. pipe & tube	SB-622	...	N06007	Solution ann.
6	47Ni-22Cr-19Fe-6Mo	Smls. pipe & tube	SB-622	...	N06007	Solution ann.
7	47Ni-22Cr-19Fe-6Mo	Wld. tube	SB-626	...	N06007	Solution ann.
8	47Ni-22Cr-19Fe-6Mo	Wld. tube	SB-626	...	N06007	Solution ann.
(23) 9	55Ni-21Cr-13.5Mo	Smls. & wld. fittings	SB-366	...	N06022	Solution ann.
10	55Ni-21Cr-13.5Mo	Forgings	SB-462	...	N06022	Solution ann.
11	55Ni-21Cr-13.5Mo	Forgings	SB-462	...	N06022	Solution ann.
12	55Ni-21Cr-13.5Mo	Forgings	SB-564	...	N06022	Solution ann.
13	55Ni-21Cr-13.5Mo	Forgings	SB-564	...	N06022	Solution ann.
14	55Ni-21Cr-13.5Mo	Rod	SB-574	...	N06022	Solution ann.
15	55Ni-21Cr-13.5Mo	Rod	SB-574	...	N06022	Solution ann.
16	55Ni-21Cr-13.5Mo	Plate, sheet, strip	SB-575	...	N06022	Solution ann.
17	55Ni-21Cr-13.5Mo	Plate, sheet, strip	SB-575	...	N06022	Solution ann.
18	55Ni-21Cr-13.5Mo	Wld. pipe	SB-619	...	N06022	Solution ann.
19	55Ni-21Cr-13.5Mo	Wld. pipe	SB-619	...	N06022	Solution ann.
20	55Ni-21Cr-13.5Mo	Smls. pipe & tube	SB-622	...	N06022	Solution ann.
21	55Ni-21Cr-13.5Mo	Smls. pipe & tube	SB-622	...	N06022	Solution ann.
22	55Ni-21Cr-13.5Mo	Wld. tube	SB-626	...	N06022	Solution ann.
23	55Ni-21Cr-13.5Mo	Wld. tube	SB-626	...	N06022	Solution ann.
(23) 24	60Ni-25Cr-9.5Fe-2.1Al	Smls. tube	SB-163	...	N06025	Annealed
(23) 25	60Ni-25Cr-9.5Fe-2.1Al	Smls. tube	SB-163	...	N06025	Annealed
(23) 26	60Ni-25Cr-9.5Fe-2.1Al	Plate, sheet, strip	SB-168	...	N06025	Annealed
(23) 27	60Ni-25Cr-9.5Fe-2.1Al	Plate, sheet, strip	SB-168	...	N06025	Annealed
(23) 28	60Ni-25Cr-9.5Fe-2.1Al	Wrought fittings	SB-366	...	N06025	Annealed
(23) 29	60Ni-25Cr-9.5Fe-2.1Al	Wrought fittings	SB-366	...	N06025	Annealed
(23) 30	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-462	...	N06025	Annealed
(23) 31	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-462	...	N06025	Annealed
(23) 32	60Ni-25Cr-9.5Fe-2.1Al	Wld. tube	SB-516	...	N06025	Annealed
(23) 33	60Ni-25Cr-9.5Fe-2.1Al	Wld. tube	SB-516	...	N06025	Annealed
(23) 34	60Ni-25Cr-9.5Fe-2.1Al	Wld. pipe	SB-517	...	N06025	Annealed
(23) 35	60Ni-25Cr-9.5Fe-2.1Al	Wld. pipe	SB-517	...	N06025	Annealed
(23) 36	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-564	...	N06025	Annealed
(23) 37	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-564	...	N06025	Annealed
(23) 38	60Ni-25Cr-9.5Fe-2.1Al	Bar	SB-166	...	N06025	HW or CW ann.
(23) 39	60Ni-25Cr-9.5Fe-2.1Al	Bar	SB-166	...	N06025	HW or CW ann.
(23) 40	60Ni-25Cr-9.5Fe-2.1Al	Smls. pipe & tube	SB-167	...	N06025	HW or CW ann.
(23) 41	60Ni-25Cr-9.5Fe-2.1Al	Smls. pipe & tube	SB-167	...	N06025	HW or CW ann.
(23) 42	40Ni-29Cr-15Fe-5Mo	Smls. & wld. fittings	SB-366	...	N06030	Solution ann.
43	40Ni-29Cr-15Fe-5Mo	Forgings	SB-462	...	N06030	Solution ann.
44	40Ni-29Cr-15Fe-5Mo	Forgings	SB-462	...	N06030	Solution ann.
45	40Ni-29Cr-15Fe-5Mo	Rod	SB-581	...	N06030	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	$\leq 3/4$	45	90	35	NP	NP	1000	650	NFN-11	...
2	$\leq 3/4$	45	90	35	NP	NP	1000	650	NFN-11	G5
3	...	45	90	35	NP	NP	1000	650	NFN-11	G14
4	...	45	90	35	NP	NP	1000	650	NFN-11	G5, G14
5	...	45	90	35	NP	NP	1000	650	NFN-11	...
6	...	45	90	35	NP	NP	1000	650	NFN-11	G5
7	...	45	90	35	NP	NP	1000	650	NFN-11	G14
8	...	45	90	35	NP	NP	1000	650	NFN-11	G5, G14
9	...	43	100	45	1250	800	1250	650	NFN-10	G5, G27, G28, T15, W5, W12
10	...	43	100	45	1250	NP	1250	NP	NFN-10	G5, G27, G28, T15
11	...	43	100	45	1250	NP	1250	NP	NFN-10	G27, G28, T15
12	...	43	100	45	1250	800	1250	650	NFN-10	G5, G27, G28, T15
13	...	43	100	45	1250	NP	1250	650	NFN-10	G27, G28, T15
14	...	43	100	45	1250	800	1250	650	NFN-10	G5, G27, G28, T15
15	...	43	100	45	1250	NP	1250	650	NFN-10	G27, G28, T15
16	...	43	100	45	1250	800	1250	650	NFN-10	G5, G27, G28, T15
17	...	43	100	45	1250	NP	1250	650	NFN-10	G27, G28, T15
18	...	43	100	45	1250	800	1250	650	NFN-10	G5, G14, G27, G28, T15, W6
19	...	43	100	45	1250	NP	1250	650	NFN-10	G14, G27, G28, T15
20	...	43	100	45	1250	800	1250	650	NFN-10	G5, G27, G28, T15
21	...	43	100	45	1250	NP	1250	650	NFN-10	G27, G28, T15
22	...	43	100	45	1250	800	1250	650	NFN-10	G5, G14, G27, G28, T15, W6
23	...	43	100	45	1250	NP	1250	650	NFN-10	G14, G27, G28, T15
24	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
25	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
26	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
27	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
28	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
29	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
30	$t \leq 4$	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
31	$t \leq 4$	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
32	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G14, G30, G31, G32, T12
33	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G14, G30, G31, G32, T13
34	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G14, G30, G31, G32, T12
35	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G14, G30, G31, G32, T13
36	$t \leq 4$	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
37	$t \leq 4$	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
38	$t \leq 4$	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
39	$t \leq 4$	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
40	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G5, G30, G31, G32, T12
41	...	43	98	39	1650	NP	1800	NP	NFN-13	G4, G30, G31, G32, T13
42	...	45	85	35	NP	800	800	650	NFN-19	G5, W5, W12
43	...	45	85	35	NP	NP	800	NP	NFN-19	G5
44	...	45	85	35	NP	NP	800	NP	NFN-19	...
45	...	45	85	35	NP	800	800	650	NFN-19	G5

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	23.3	...	21.0	...	19.5	...	18.3	...	17.4	...	16.8	16.6	16.4	16.3	16.2	16.1	16.0	15.9
2	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.7	22.4	22.2	22.0	21.8	21.7	21.6	21.5
3	19.8	...	17.8	...	16.5	...	15.5	...	14.8	...	14.3	14.1	14.0	13.8	13.7	13.7	13.6	13.5
4	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.3	19.1	18.8	18.7	18.5	18.4	18.3	18.3
5	23.3	...	21.0	...	19.5	...	18.3	...	17.4	...	16.8	16.6	16.4	16.3	16.2	16.1	16.0	15.9
6	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.7	22.4	22.2	22.0	21.8	21.7	21.6	21.5
7	19.8	...	17.8	...	16.5	...	15.5	...	14.8	...	14.3	14.1	14.0	13.8	13.7	13.7	13.6	13.5
8	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.3	19.1	18.8	18.7	18.5	18.4	18.3	18.3
9	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	26.0	25.8	25.6	25.4	25.3	25.1	24.9	24.7
10	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	26.0	25.8	25.6	25.4	25.3	25.1	24.9	24.7
11	28.6	...	26.7	...	24.6	...	22.9	...	21.5	...	20.4	20.0	19.6	19.3	19.0	18.8	18.6	18.5
12	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	26.0	25.8	25.6	25.4	25.3	25.1	24.9	24.7
13	28.6	...	26.7	...	24.6	...	22.9	...	21.5	...	20.4	20.0	19.6	19.3	19.0	18.8	18.6	18.5
14	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	26.0	25.8	25.6	25.4	25.3	25.1	24.9	24.7
15	28.6	...	26.7	...	24.6	...	22.9	...	21.5	...	20.4	20.0	19.6	19.3	19.0	18.8	18.6	18.5
16	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	26.0	25.8	25.6	25.4	25.3	25.1	24.9	24.7
17	28.6	...	26.7	...	24.6	...	22.9	...	21.5	...	20.4	20.0	19.6	19.3	19.0	18.8	18.6	18.5
18	24.3	...	24.3	...	23.9	...	23.1	...	22.6	...	22.1	21.9	21.8	21.6	21.5	21.3	21.1	21.0
19	24.3	...	22.7	...	20.9	...	19.4	...	18.3	...	17.4	17.0	16.7	16.4	16.2	16.0	15.8	15.7
20	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	26.0	25.8	25.6	25.4	25.3	25.1	24.9	24.7
21	28.6	...	26.7	...	24.6	...	22.9	...	21.5	...	20.4	20.0	19.6	19.3	19.0	18.8	18.6	18.5
22	24.3	...	24.3	...	23.9	...	23.1	...	22.6	...	22.1	21.9	21.8	21.6	21.5	21.3	21.1	21.0
23	24.3	...	22.7	...	20.9	...	19.4	...	18.3	...	17.4	17.0	16.7	16.4	16.2	16.0	15.8	15.7
24	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
25	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
26	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
27	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
28	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
29	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
30	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
31	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
32	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
33	22.1	22.1	21.9	21.6	21.1	20.3	20.1	19.6	19.1	18.7	18.3	17.9	17.6	17.4	17.2	17.0	16.9	16.8
34	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
35	22.1	22.1	21.9	21.6	21.1	20.6	20.1	19.6	19.1	18.7	18.3	17.9	17.6	17.4	17.2	17.0	16.9	16.8
36	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
37	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
38	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
39	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
40	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
41	26.0	26.0	25.8	25.4	24.9	24.3	23.7	23.1	22.5	22.0	21.5	21.1	20.7	20.4	20.2	20.0	19.9	19.8
42	23.3	...	23.3	...	23.3	...	22.5	...	21.9	...	21.3	20.9	20.5	20.1	19.7	...	...	...
43	23.3	...	23.3	...	23.3	...	22.5	...	21.9	...	21.3	20.9	20.5	20.1	19.7	...	...	...
44	23.3	...	20.0	...	18.3	...	17.2	...	16.4	...	15.8	15.5	15.2	14.9	14.6	...	...	...
45	23.3	...	23.3	...	23.3	...	22.5	...	21.9	...	21.3	20.9	20.5	20.1	19.7	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	15.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	21.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	13.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	18.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	15.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	21.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	13.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	18.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	24.4	23.0	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	(23)
10	24.4	23.0	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	
11	18.3	18.2	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
12	24.4	23.0	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
13	18.3	18.2	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
14	24.4	23.0	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
15	18.3	18.2	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
16	24.4	23.0	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
17	18.3	18.2	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
18	20.7	19.6	14.9	10.8	8.2	6.5	...	...	...	...	...	...	...	...	...	...	...
19	15.6	15.5	14.9	10.8	8.2	6.5	...	...	...	...	...	...	...	...	...	...	...
20	24.4	23.0	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
21	18.3	18.2	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...	...	...	...
22	20.7	19.6	14.9	10.8	8.2	6.5	...	...	...	...	...	...	...	...	...	...	...
23	15.6	15.5	14.9	10.8	8.2	6.5	...	...	...	...	...	...	...	...	...	...	...
24	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
25	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
26	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
27	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
28	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
29	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
30	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
31	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
32	21.5	16.1	13.3	10.7	8.7	7.0	5.7	4.7	3.4	1.7	1.1	0.92	0.74	0.60	0.48	0.39	0.32 (23)
33	16.7	16.1	13.3	10.7	8.7	7.0	5.7	4.7	3.4	1.7	1.1	0.92	0.74	0.60	0.48	0.39	0.32 (23)
34	21.5	16.1	13.3	10.7	8.7	7.0	5.7	4.7	3.4	1.7	1.1	0.92	0.74	0.60	0.48	0.39	0.32 (23)
35	16.7	16.1	13.3	10.7	8.7	7.0	5.7	4.7	3.4	1.7	1.1	0.92	0.74	0.60	0.48	0.39	0.32 (23)
36	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
37	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
38	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
39	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
40	25.3	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
41	19.7	18.9	15.6	12.6	10.2	8.3	6.7	5.5	4.1	2.0	1.3	1.1	0.87	0.70	0.57	0.46	0.37 (23)
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	40Ni-29Cr-15Fe-5Mo	Rod	SB-581	...	N06030	Solution ann.
2	40Ni-29Cr-15Fe-5Mo	Plate, sheet, strip	SB-582	...	N06030	Solution ann.
3	40Ni-29Cr-15Fe-5Mo	Plate, sheet, strip	SB-582	...	N06030	Solution ann.
4	40Ni-29Cr-15Fe-5Mo	Wld. pipe	SB-619	...	N06030	Solution ann.
5	40Ni-29Cr-15Fe-5Mo	Wld. pipe	SB-619	...	N06030	Solution ann.
6	40Ni-29Cr-15Fe-5Mo	Smls. pipe & tube	SB-622	...	N06030	Solution ann.
7	40Ni-29Cr-15Fe-5Mo	Smls. pipe & tube	SB-622	...	N06030	Solution ann.
8	40Ni-29Cr-15Fe-5Mo	Wld. tube	SB-626	...	N06030	Solution ann.
9	40Ni-29Cr-15Fe-5Mo	Wld. tube	SB-626	...	N06030	Solution ann.
10	58Ni-33Cr-8Mo	Smls. & wld. fittings	SB-366	...	N06035	Solution ann.
11	58Ni-33Cr-8Mo	Forgings	SB-462	...	N06035	Solution ann.
12	58Ni-33Cr-8Mo	Forgings	SB-462	...	N06035	Solution ann.
13	58Ni-33Cr-8Mo	Forgings	SB-564	...	N06035	Solution ann.
14	58Ni-33Cr-8Mo	Forgings	SB-564	...	N06035	Solution ann.
15	58Ni-33Cr-8Mo	Rod	SB-574	...	N06035	Solution ann.
16	58Ni-33Cr-8Mo	Rod	SB-574	...	N06035	Solution ann.
17	58Ni-33Cr-8Mo	Plate, sheet, strip	SB-575	...	N06035	Solution ann.
18	58Ni-33Cr-8Mo	Plate, sheet, strip	SB-575	...	N06035	Solution ann.
19	58Ni-33Cr-8Mo	Wld. pipe	SB-619	...	N06035	Solution ann.
20	58Ni-33Cr-8Mo	Wld. pipe	SB-619	...	N06035	Solution ann.
21	58Ni-33Cr-8Mo	Smls. pipe & tube	SB-622	...	N06035	Solution ann.
22	58Ni-33Cr-8Mo	Smls. pipe & tube	SB-622	...	N06035	Solution ann.
23	58Ni-33Cr-8Mo	Wld. tube	SB-626	...	N06035	Solution ann.
24	58Ni-33Cr-8Mo	Wld. tube	SB-626	...	N06035	Solution ann.
25	46Ni-27Cr-23Fe-2.75Si	Rod	SB-166	...	N06045	Solution ann.
26	46Ni-27Cr-23Fe-2.75Si	Rod	SB-166	...	N06045	Solution ann.
27	46Ni-27Cr-23Fe-2.75Si	Smls. pipe & tube	SB-167	...	N06045	Solution ann.
28	46Ni-27Cr-23Fe-2.75Si	Smls. pipe & tube	SB-167	...	N06045	Solution ann.
29	46Ni-27Cr-23Fe-2.75Si	Plate, sheet, strip	SB-168	...	N06045	Solution ann.
30	46Ni-27Cr-23Fe-2.75Si	Plate, sheet, strip	SB-168	...	N06045	Solution ann.
31	46Ni-27Cr-23Fe-2.75Si	Smls. & wld. fittings	SB-366	...	N06045	Solution ann.
32	46Ni-27Cr-23Fe-2.75Si	Forged fittings	SB-462	...	N06045	Solution ann.
33	46Ni-27Cr-23Fe-2.75Si	Forged fittings	SB-462	...	N06045	Solution ann.
34	46Ni-27Cr-23Fe-2.75Si	Wld. tube	SB-516	...	N06045	Solution ann.
35	46Ni-27Cr-23Fe-2.75Si	Wld. tube	SB-516	...	N06045	Solution ann.
36	46Ni-27Cr-23Fe-2.75Si	Wld. pipe	SB-517	...	N06045	Solution ann.
37	46Ni-27Cr-23Fe-2.75Si	Wld. pipe	SB-517	...	N06045	Solution ann.
38	46Ni-27Cr-23Fe-2.75Si	Forgings	SB-564	...	N06045	Solution ann.
39	46Ni-27Cr-23Fe-2.75Si	Forgings	SB-564	...	N06045	Solution ann.
40	59Ni-23Cr-16Mo	Fittings	SB-366	CR5923	N06059	Annealed
41	59Ni-23Cr-16Mo	Fittings	SB-366	WP5923	N06059	Annealed
42	59Ni-23Cr-16Mo	Wld. fittings	SB-366	WP5923W	N06059	Annealed
43	59Ni-23Cr-16Mo	Fittings	SB-366	WP5923WX	N06059	Annealed
44	59Ni-23Cr-16Mo	Forged fittings	SB-462	...	N06059	Solution ann.
45	59Ni-23Cr-16Mo	Forged fittings	SB-462	...	N06059	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	45	85	35	NP	NP	800	650	NFN-19	...
2	...	45	85	35	NP	800	800	650	NFN-19	G5
3	...	45	85	35	NP	NP	800	650	NFN-19	...
4	...	45	85	35	NP	800	800	650	NFN-19	G5, G14, W6
5	...	45	85	35	NP	NP	800	650	NFN-19	G14
6	...	45	85	35	NP	800	800	650	NFN-19	G5
7	...	45	85	35	NP	NP	800	650	NFN-19	...
8	...	45	85	35	NP	800	800	650	NFN-19	G5, G14, W6
9	...	45	85	35	NP	NP	800	650	NFN-19	G14
10	...	43	85	35	NP	NP	800	NP	NFN-27	G5, W12
11	...	43	85	35	NP	NP	800	NP	NFN-27	G5
12	...	43	85	35	NP	NP	800	NP	NFN-27	...
13	...	43	85	35	NP	NP	800	NP	NFN-27	G5
14	...	43	85	35	NP	NP	800	NP	NFN-27	...
15	...	43	85	35	NP	NP	800	NP	NFN-27	G5
16	...	43	85	35	NP	NP	800	NP	NFN-27	...
17	...	43	85	35	NP	NP	800	NP	NFN-27	G5
18	...	43	85	35	NP	NP	800	NP	NFN-27	...
19	...	43	85	35	NP	NP	800	NP	NFN-27	G5, G14
20	...	43	85	35	NP	NP	800	NP	NFN-27	G14
21	...	43	85	35	NP	NP	800	NP	NFN-27	G5
22	...	43	85	35	NP	NP	800	NP	NFN-27	...
23	...	43	85	35	NP	NP	800	NP	NFN-27	G5, G14
24	...	43	85	35	NP	NP	800	NP	NFN-27	G14
25	...	46	90	35	1500	NP	1500	NP	NFN-8	G1, G5, T11
26	...	46	90	35	1500	NP	1500	NP	NFN-8	T11
27	...	46	90	35	1500	NP	1500	NP	NFN-8	G1, G5, T11
28	...	46	90	35	1500	NP	1500	NP	NFN-8	T11
29	...	46	90	35	1500	NP	1500	NP	NFN-8	G1, G5, T11
30	...	46	90	35	1500	NP	1500	NP	NFN-8	T11
31	...	46	90	35	1500	NP	1500	NP	NFN-8	G5, T11, W12
32	...	46	90	35	1500	NP	1500	NP	NFN-8	G5, T11
33	...	46	90	35	1500	NP	1500	NP	NFN-8	T11
34	...	46	90	35	1500	NP	1500	NP	NFN-8	G5, G14, T11
35	...	46	90	35	1500	NP	1500	NP	NFN-8	G14, T11
36	...	46	90	35	1500	NP	1500	NP	NFN-8	G1, G5, G14, T11
37	...	46	90	35	1500	NP	1500	NP	NFN-8	G14, T11
38	...	46	90	35	1500	NP	1500	NP	NFN-8	G1, G5, T11
39	...	46	90	35	1500	NP	1500	NP	NFN-8	T11
40	...	43	100	45	NP	800	1400	650	NFN-14	G5, G14, G23, T16
41	...	43	100	45	NP	800	1400	650	NFN-14	G5, G23, T16
42	...	43	100	45	NP	800	1400	650	NFN-14	G5, G14, G23, T16
43	...	43	100	45	NP	800	1400	650	NFN-14	G5, G23, T16
44	...	43	100	45	NP	NP	1400	650	NFN-14	G23, T16
45	...	43	100	45	NP	NP	1400	650	NFN-14	G5, G23, T16

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	23.3	...	20.0	...	18.3	...	17.2	...	16.4	...	15.8	15.5	15.2	14.9	14.6	...	...	...
2	23.3	...	23.3	...	23.3	...	22.5	...	21.9	...	21.3	20.9	20.5	20.1	19.7	...	...	...
3	23.3	...	20.0	...	18.3	...	17.2	...	16.4	...	15.8	15.5	15.2	14.9	14.6	...	...	...
4	19.8	...	19.8	...	19.8	...	19.1	...	18.6	...	18.1	17.7	17.4	17.1	16.8	...	...	...
5	19.8	...	17.0	...	15.6	...	14.6	...	13.9	...	13.4	13.1	12.9	12.7	12.4	...	...	...
6	23.3	...	23.3	...	23.3	...	22.5	...	21.9	...	21.3	20.9	20.5	20.1	19.7	...	...	...
7	23.3	...	20.0	...	18.3	...	17.2	...	16.4	...	15.8	15.5	15.2	14.9	14.6	...	...	...
8	19.8	...	19.8	...	19.8	...	19.1	...	18.6	...	18.1	17.7	17.4	17.1	16.8	...	...	...
9	19.8	...	17.0	...	15.6	...	14.6	...	13.9	...	13.4	13.1	12.9	12.7	12.4	...	...	...
10	23.3	...	23.3	...	23.3	...	22.2	...	20.5	...	19.7	19.4	19.2	19.0	18.8	...	...	...
11	23.3	...	23.3	...	23.3	...	22.2	...	20.5	...	19.7	19.4	19.2	19.0	18.8	...	...	...
12	23.3	...	20.4	...	18.2	...	16.5	...	15.3	...	14.6	14.4	14.2	14.1	13.9	...	...	...
13	23.3	...	23.3	...	23.3	...	22.2	...	20.5	...	19.7	19.4	19.2	19.0	18.8	...	...	...
14	23.3	...	20.4	...	18.2	...	16.5	...	15.3	...	14.6	14.4	14.2	14.1	13.9	...	...	...
15	23.3	...	23.3	...	23.3	...	22.2	...	20.5	...	19.7	19.4	19.2	19.0	18.8	...	...	...
16	23.3	...	20.4	...	18.2	...	16.5	...	15.3	...	14.6	14.4	14.2	14.1	13.9	...	...	...
17	23.3	...	23.3	...	23.3	...	22.2	...	20.5	...	19.7	19.4	19.2	19.0	18.8	...	...	...
18	23.3	...	20.4	...	18.2	...	16.5	...	15.3	...	14.6	14.4	14.2	14.1	13.9	...	...	...
19	19.8	...	19.8	...	19.8	...	18.9	...	17.4	...	16.7	16.5	16.3	16.2	16.0	...	...	...
20	19.8	...	17.3	...	15.5	...	14.0	...	13.0	...	12.4	12.2	12.1	12.0	11.8	...	...	...
21	23.3	...	23.3	...	23.3	...	22.2	...	20.5	...	19.7	19.4	19.2	19.0	18.8	...	...	...
22	23.3	...	20.4	...	18.2	...	16.5	...	15.3	...	14.6	14.4	14.2	14.1	13.9	...	...	...
23	19.8	...	19.8	...	19.8	...	18.9	...	17.4	...	16.7	16.5	16.3	16.2	16.0	...	...	...
24	19.8	...	17.3	...	15.5	...	14.0	...	13.0	...	12.4	12.2	12.1	12.0	11.8	...	...	...
25	23.3	...	23.3	...	23.3	...	23.3	...	22.6	...	22.1	21.9	21.7	21.6	21.4	21.1	16.0	12.9
26	23.3	...	20.9	...	19.3	...	18.1	...	17.4	...	17.0	16.8	16.8	16.7	16.6	16.5	16.0	12.9
27	23.3	...	23.3	...	23.3	...	23.3	...	22.6	...	22.1	21.9	21.7	21.6	21.4	21.1	16.0	12.9
28	23.3	...	20.9	...	19.3	...	18.1	...	17.4	...	17.0	16.8	16.8	16.7	16.6	16.5	16.0	12.9
29	23.3	...	23.3	...	23.3	...	23.3	...	22.6	...	22.1	21.9	21.7	21.6	21.4	21.1	16.0	12.9
30	23.3	...	20.9	...	19.3	...	18.1	...	17.4	...	17.0	16.8	16.8	16.7	16.6	16.5	16.0	12.9
31	23.3	...	23.3	...	23.3	...	23.3	...	22.6	...	22.1	21.9	21.7	21.6	21.4	21.1	16.0	12.9
32	23.3	...	23.3	...	23.3	...	23.3	...	22.6	...	22.1	21.9	21.7	21.6	21.4	21.1	16.0	12.9
33	23.3	...	20.9	...	19.3	...	18.1	...	17.4	...	17.0	16.8	16.8	16.7	16.6	16.5	16.0	12.9
34	19.8	...	19.8	...	19.8	...	19.8	...	19.2	...	18.8	18.6	18.4	18.4	18.2	17.9	13.6	11.0
35	19.8	...	17.8	...	16.4	...	15.4	...	14.8	...	14.5	14.3	14.3	14.2	14.1	14.0	13.6	11.0
36	19.8	...	19.8	...	19.8	...	19.8	...	19.2	...	18.8	18.6	18.4	18.4	18.2	17.9	13.6	11.0
37	19.8	...	17.8	...	16.4	...	15.4	...	14.8	...	14.5	14.3	14.3	14.2	14.1	14.0	13.6	11.0
38	23.3	...	23.3	...	23.3	...	23.3	...	22.6	...	22.1	21.9	21.7	21.6	21.4	21.1	16.0	12.9
39	23.3	...	20.9	...	19.3	...	18.1	...	17.4	...	17.0	16.8	16.8	16.7	16.6	16.5	16.0	12.9
40	24.3	...	24.3	...	24.3	...	23.8	...	23.0	...	22.1	21.8	21.4	21.2	20.9	20.7	20.6	20.1
41	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7
42	24.3	...	24.3	...	24.3	...	23.8	...	23.0	...	22.1	21.8	21.4	21.2	20.9	20.7	20.6	20.1
43	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7
44	28.6	...	26.9	...	25.2	...	23.8	...	22.6	...	21.4	20.8	20.2	19.6	19.1	18.5	18.0	17.5
45	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
26	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
27	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
28	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
29	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
30	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
31	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
32	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
33	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
34	8.0	6.0	4.8	3.7	3.0	2.4	1.9	1.5	1.2	0.90	0.70	...	...	...	...	...	...
35	8.0	6.0	4.8	3.7	3.0	2.4	1.9	1.5	1.2	0.90	0.70	...	...	...	...	...	...
36	8.0	6.0	4.8	3.7	3.0	2.4	1.9	1.5	1.2	0.90	0.70	...	...	...	...	...	...
37	8.0	6.0	4.8	3.7	3.0	2.4	1.9	1.5	1.2	0.90	0.70	...	...	...	...	...	...
38	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
39	9.4	7.1	5.6	4.4	3.5	2.8	2.2	1.8	1.4	1.1	0.85	...	...	...	...	...	...
40	19.6	19.2	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...	...	...	...
41	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
42	19.6	19.2	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...	...	...	...
43	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
44	17.1	16.8	16.5	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
45	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	59Ni-23Cr-16Mo	Forgings	SB-564	...	N06059	Solution ann.
2	59Ni-23Cr-16Mo	Forgings	SB-564	...	N06059	Solution ann.
3	59Ni-23Cr-16Mo	Rod	SB-574	...	N06059	Solution ann.
4	59Ni-23Cr-16Mo	Rod	SB-574	...	N06059	Solution ann.
5	59Ni-23Cr-16Mo	Plate, sheet, strip	SB-575	...	N06059	Solution ann.
6	59Ni-23Cr-16Mo	Plate, sheet, strip	SB-575	...	N06059	Solution ann.
7	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.
8	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.
9	59Ni-23Cr-16Mo	Smls. pipe & tube	SB-622	...	N06059	Solution ann.
10	59Ni-23Cr-16Mo	Smls. pipe & tube	SB-622	...	N06059	Solution ann.
11	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.
12	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.
13	59Ni-23Cr-16Mo-1.6Cu	Smls. & wld. fittings	SB-366	...	N06200	Solution ann.
14	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-462	...	N06200	Solution ann.
15	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-462	...	N06200	Solution ann.
16	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-564	...	N06200	Solution ann.
17	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-564	...	N06200	Solution ann.
18	59Ni-23Cr-16Mo-1.6Cu	Rod	SB-574	...	N06200	Solution ann.
19	59Ni-23Cr-16Mo-1.6Cu	Rod	SB-574	...	N06200	Solution ann.
20	59Ni-23Cr-16Mo-1.6Cu	Plate, sheet, strip	SB-575	...	N06200	Solution ann.
21	59Ni-23Cr-16Mo-1.6Cu	Plate, sheet, strip	SB-575	...	N06200	Solution ann.
22	59Ni-23Cr-16Mo-1.6Cu	Wld. pipe	SB-619	...	N06200	Solution ann.
23	59Ni-23Cr-16Mo-1.6Cu	Wld. pipe	SB-619	...	N06200	Solution ann.
24	59Ni-23Cr-16Mo-1.6Cu	Smls. pipe & tube	SB-622	...	N06200	Solution ann.
25	59Ni-23Cr-16Mo-1.6Cu	Smls. pipe & tube	SB-622	...	N06200	Solution ann.
26	59Ni-23Cr-16Mo-1.6Cu	Wld. tube	SB-626	...	N06200	Solution ann.
27	59Ni-23Cr-16Mo-1.6Cu	Wld. tube	SB-626	...	N06200	Solution ann.
28	60Ni-19Cr-19Mo-1.8Ta	Smls. & wld. fittings	SB-366	...	N06210	Solution ann.
29	60Ni-19Cr-19Mo-1.8Ta	Forgings	SB-564	...	N06210	Solution ann.
30	60Ni-19Cr-19Mo-1.8Ta	Forgings	SB-564	...	N06210	Solution ann.
31	60Ni-19Cr-19Mo-1.8Ta	Rod	SB-574	...	N06210	Solution ann.
32	60Ni-19Cr-19Mo-1.8Ta	Rod	SB-574	...	N06210	Solution ann.
33	60Ni-19Cr-19Mo-1.8Ta	Plate, sheet, strip	SB-575	...	N06210	Solution ann.
34	60Ni-19Cr-19Mo-1.8Ta	Plate, sheet, strip	SB-575	...	N06210	Solution ann.
35	60Ni-19Cr-19Mo-1.8Ta	Wld. pipe	SB-619	...	N06210	Solution ann.
36	60Ni-19Cr-19Mo-1.8Ta	Wld. pipe	SB-619	...	N06210	Solution ann.
37	60Ni-19Cr-19Mo-1.8Ta	Smls. pipe & tube	SB-622	...	N06210	Solution ann.
38	60Ni-19Cr-19Mo-1.8Ta	Smls. pipe & tube	SB-622	...	N06210	Solution ann.
39	60Ni-19Cr-19Mo-1.8Ta	Wld. tube	SB-626	...	N06210	Solution ann.
40	60Ni-19Cr-19Mo-1.8Ta	Wld. tube	SB-626	...	N06210	Solution ann.
41	57Ni-22Cr-14W-2Mo-La	Smls. & wld. fittings	SB-366	...	N06230	Solution ann.
42	57Ni-22Cr-14W-2Mo-La	Plate, sheet, strip	SB-435	...	N06230	Solution ann.
43	57Ni-22Cr-14W-2Mo-La	Plate, sheet, strip	SB-435	...	N06230	Solution ann.
44	57Ni-22Cr-14W-2Mo-La	Forgings	SB-564	...	N06230	Solution ann.
45	57Ni-22Cr-14W-2Mo-La	Forgings	SB-564	...	N06230	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	43	100	45	NP	800	1400	650	NFN-14	G23, T16
2	...	43	100	45	NP	800	1400	650	NFN-14	G5, G23, T16
3	...	43	100	45	NP	800	1400	650	NFN-14	G23, T16
4	...	43	100	45	NP	800	1400	650	NFN-14	G5, G23, T16
5	...	43	100	45	NP	800	1400	650	NFN-14	G23, T16
6	...	43	100	45	NP	800	1400	650	NFN-14	G5, G23, T16
7	...	43	100	45	NP	800	1400	650	NFN-14	G14, G23, T16
8	...	43	100	45	NP	800	1400	650	NFN-14	G5, G14, G23, T16
9	...	43	100	45	NP	800	1400	650	NFN-14	G23, T16
10	...	43	100	45	NP	800	1400	650	NFN-14	G5, G23, T16
11	...	43	100	45	NP	800	1400	650	NFN-14	G14, G23, T16
12	...	43	100	45	NP	800	1400	650	NFN-14	G5, G14, G23, T16
13	...	43	100	45	NP	NP	800	NP	NFN-10	G5, W12
14	...	43	100	45	NP	NP	800	NP	NFN-10	...
15	...	43	100	45	NP	NP	800	NP	NFN-10	G5
16	...	43	100	45	NP	NP	800	NP	NFN-10	...
17	...	43	100	45	NP	NP	800	NP	NFN-10	G5
18	...	43	100	45	NP	NP	800	NP	NFN-10	...
19	...	43	100	45	NP	NP	800	NP	NFN-10	G5
20	...	43	100	45	NP	NP	800	NP	NFN-10	...
21	...	43	100	45	NP	NP	800	NP	NFN-10	G5
22	...	43	100	45	NP	NP	800	NP	NFN-10	G14
23	...	43	100	45	NP	NP	800	NP	NFN-10	G5, G14
24	...	43	100	45	NP	NP	800	NP	NFN-10	...
25	...	43	100	45	NP	NP	800	NP	NFN-10	G5
26	...	43	100	45	NP	NP	800	NP	NFN-10	G14
27	...	43	100	45	NP	NP	800	NP	NFN-10	G5, G14
28	...	43	100	45	NP	NP	800	NP	NFN-14	G5, W12
29	...	43	100	45	NP	NP	800	NP	NFN-14	...
30	...	43	100	45	NP	NP	800	NP	NFN-14	G5
31	...	43	100	45	NP	NP	800	NP	NFN-14	...
32	...	43	100	45	NP	NP	800	NP	NFN-14	G5
33	...	43	100	45	NP	NP	800	NP	NFN-14	...
34	...	43	100	45	NP	NP	800	NP	NFN-14	G5
35	...	43	100	45	NP	NP	800	NP	NFN-14	...
36	...	43	100	45	NP	NP	800	NP	NFN-14	G5, G14
37	...	43	100	45	NP	NP	800	NP	NFN-14	...
38	...	43	100	45	NP	NP	800	NP	NFN-14	G5
39	...	43	100	45	NP	NP	800	NP	NFN-14	...
40	...	43	100	45	NP	NP	800	NP	NFN-14	G5, G14
41	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, T15, W12
42	...	43	110	45	1650	NP	1800	650	NFN-24	G4, T16
43	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, T15
44	...	43	110	45	1650	NP	1800	650	NFN-24	G4, T16
45	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, T15

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	28.6	...	26.9	...	25.2	...	23.8	...	22.6	...	21.4	20.8	20.2	19.6	19.1	18.5	18.0	17.5
2	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7
3	28.6	...	26.9	...	25.2	...	23.8	...	22.6	...	21.4	20.8	20.2	19.6	19.1	18.5	18.0	17.5
4	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7
5	28.6	...	26.9	...	25.2	...	23.8	...	22.6	...	21.4	20.8	20.2	19.6	19.1	18.5	18.0	17.5
6	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7
7	24.3	...	22.9	...	21.4	...	20.2	...	19.2	...	18.2	17.7	17.2	16.7	16.2	15.7	15.3	14.9
8	24.3	...	24.3	...	24.3	...	23.8	...	23.0	...	22.1	21.8	21.4	21.2	20.9	20.7	20.6	20.1
9	28.6	...	26.9	...	25.2	...	23.8	...	22.6	...	21.4	20.8	20.2	19.6	19.1	18.5	18.0	17.5
10	28.6	...	28.6	...	28.6	...	28.0	...	27.0	...	26.0	25.6	25.2	24.9	24.6	24.4	24.2	23.7
11	24.3	...	22.9	...	21.4	...	20.2	...	19.2	...	18.2	17.7	17.2	16.7	16.2	15.7	15.3	14.9
12	24.3	...	24.3	...	24.3	...	23.8	...	23.0	...	22.1	21.8	21.4	21.2	20.9	20.7	20.6	20.1
13	28.6	...	28.6	...	28.6	...	27.6	...	26.8	...	26.2	26.0	25.7	25.4	25.2	...	...	...
14	28.6	...	26.9	...	24.8	...	22.9	...	21.2	...	19.9	19.4	19.1	18.8	18.7	...	...	...
15	28.6	...	28.6	...	28.6	...	27.6	...	26.8	...	26.2	26.0	25.7	25.4	25.2	...	...	...
16	28.6	...	26.9	...	24.8	...	22.9	...	21.2	...	19.9	19.4	19.1	18.8	18.7	...	...	...
17	28.6	...	28.6	...	28.6	...	27.6	...	26.8	...	26.2	26.0	25.7	25.4	25.2	...	...	...
18	28.6	...	26.9	...	24.8	...	22.9	...	21.2	...	19.9	19.4	19.1	18.8	18.7	...	...	...
19	28.6	...	28.6	...	28.6	...	27.6	...	26.8	...	26.2	26.0	25.7	25.4	25.2	...	...	...
20	28.6	...	26.9	...	24.8	...	22.9	...	21.2	...	19.9	19.4	19.1	18.8	18.7	...	...	...
21	28.6	...	28.6	...	28.6	...	27.6	...	26.8	...	26.2	26.0	25.7	25.4	25.2	...	...	...
22	24.3	...	22.9	...	21.1	...	19.4	...	18.0	...	16.9	16.5	16.2	16.0	15.9	...	...	...
23	24.3	...	24.3	...	24.3	...	23.5	...	22.8	...	22.3	22.1	21.9	21.6	21.4	...	...	...
24	28.6	...	26.9	...	24.8	...	22.9	...	21.2	...	19.9	19.4	19.1	18.8	18.7	...	...	...
25	28.6	...	28.6	...	28.6	...	27.6	...	26.8	...	26.2	26.0	25.7	25.4	25.2	...	...	...
26	24.3	...	22.9	...	21.1	...	19.4	...	18.0	...	16.9	16.5	16.2	16.0	15.9	...	...	...
27	24.3	...	24.3	...	24.3	...	23.5	...	22.8	...	22.3	22.1	21.9	21.6	21.4	...	...	...
28	28.6	...	28.6	...	28.5	...	27.6	...	26.9	...	26.3	25.5	24.8	24.1	23.6	...	...	...
29	28.6	...	26.6	...	24.5	...	22.6	...	21.0	...	19.5	18.9	18.4	17.9	17.5	...	...	...
30	28.6	...	28.6	...	28.5	...	27.6	...	26.9	...	26.3	25.5	24.8	24.1	23.6	...	...	...
31	28.6	...	26.6	...	24.5	...	22.6	...	21.0	...	19.5	18.9	18.4	17.9	17.5	...	...	...
32	28.6	...	28.6	...	28.5	...	27.6	...	26.9	...	26.3	25.5	24.8	24.1	23.6	...	...	...
33	28.6	...	26.6	...	24.5	...	22.6	...	21.0	...	19.5	18.9	18.4	17.9	17.5	...	...	...
34	28.6	...	28.6	...	28.5	...	27.6	...	26.9	...	26.3	25.5	24.8	24.1	23.6	...	...	...
35	24.3	...	22.6	...	20.8	...	19.2	...	17.8	...	16.6	16.1	15.6	15.2	14.8	...	...	...
36	24.3	...	24.3	...	24.2	...	23.5	...	22.9	...	22.4	21.7	21.1	20.5	20.0	...	...	...
37	28.6	...	26.6	...	24.5	...	22.6	...	21.0	...	19.5	18.9	18.4	17.9	17.5	...	...	...
38	28.6	...	28.6	...	28.5	...	27.6	...	26.9	...	26.3	25.5	24.8	24.1	23.6	...	...	...
39	24.3	...	22.6	...	20.8	...	19.2	...	17.8	...	16.6	16.1	15.6	15.2	14.8	...	...	...
40	24.3	...	24.3	...	24.2	...	23.5	...	22.9	...	22.4	21.7	21.1	20.5	20.0	...	...	...
41	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.4	29.1	28.7	28.4	28.2	28.2	28.2	28.2
42	30.0	...	28.2	...	26.4	...	24.7	...	23.1	...	22.0	21.5	21.2	21.0	20.9	20.9	20.9	20.9
43	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.4	29.1	28.7	28.4	28.2	28.2	28.2	28.2
44	30.0	...	28.2	...	26.4	...	24.7	...	23.1	...	22.0	21.5	21.2	21.0	20.9	20.9	20.9	20.9
45	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.4	29.1	28.7	28.4	28.2	28.2	28.2	28.2

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	17.1	16.8	16.5	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
2	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
3	17.1	16.8	16.5	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
4	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
5	17.1	16.8	16.5	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
6	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
7	14.5	14.3	14.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...	...	...	...
8	19.6	19.2	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...	...	...	...
9	17.1	16.8	16.5	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
10	23.1	22.6	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...	...	...	...
11	14.5	14.3	14.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...	...	...	...
12	19.6	19.2	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	28.2	28.2	23.2	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
42	20.9	20.9	20.9	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
43	28.2	28.2	23.2	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
44	20.9	20.9	20.9	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
45	28.2	28.2	23.2	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	57Ni-22Cr-14W-2Mo-La	Bar	SB-572	...	N06230	Solution ann.
2	57Ni-22Cr-14W-2Mo-La	Bar	SB-572	...	N06230	Solution ann.
3	57Ni-22Cr-14W-2Mo-La	Wld. pipe	SB-619	...	N06230	Solution ann.
4	57Ni-22Cr-14W-2Mo-La	Wld. pipe	SB-619	...	N06230	Solution ann.
5	57Ni-22Cr-14W-2Mo-La	Smls. pipe & tube	SB-622	...	N06230	Solution ann.
6	57Ni-22Cr-14W-2Mo-La	Smls. pipe & tube	SB-622	...	N06230	Solution ann.
7	57Ni-22Cr-14W-2Mo-La	Wld. tube	SB-626	...	N06230	Solution ann.
8	57Ni-22Cr-14W-2Mo-La	Wld. tube	SB-626	...	N06230	Solution ann.
9	61Ni-16Mo-16Cr	Smls. & wld. fittings	SB-366	...	N06455	Annealed
10	61Ni-16Mo-16Cr	Rod	SB-574	...	N06455	Solution ann.
11	61Ni-16Mo-16Cr	Rod	SB-574	...	N06455	Solution ann.
12	61Ni-16Mo-16Cr	Plate, sheet, strip	SB-575	...	N06455	Solution ann.
13	61Ni-16Mo-16Cr	Plate, sheet, strip	SB-575	...	N06455	Solution ann.
14	61Ni-16Mo-16Cr	Wld. pipe	SB-619	...	N06455	Solution ann.
15	61Ni-16Mo-16Cr	Wld. pipe	SB-619	...	N06455	Solution ann.
16	61Ni-16Mo-16Cr	Smls. pipe & tube	SB-622	...	N06455	Solution ann.
17	61Ni-16Mo-16Cr	Smls. pipe & tube	SB-622	...	N06455	Solution ann.
18	61Ni-16Mo-16Cr	Wld. tube	SB-626	...	N06455	Solution ann.
19	61Ni-16Mo-16Cr	Wld. tube	SB-626	...	N06455	Solution ann.
20	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
(23) 21	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
22	72Ni-15Cr-8Fe	Smls. & wld. fittings	SB-366	...	N06600	Annealed
23	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.
24	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.
25	...	...	...	...	...	...
26	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
27	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
28	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed
29	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed
30	72Ni-15Cr-8Fe	Bar	SB-166	...	N06600	Annealed
31	72Ni-15Cr-8Fe	Bar	SB-166	...	N06600	Annealed
32	72Ni-15Cr-8Fe	Plate	SB-168	...	N06600	Annealed
33	72Ni-15Cr-8Fe	Plate, sheet, strip	SB-168	...	N06600	Annealed
34	72Ni-15Cr-8Fe	Wld. tube	SB-516	...	N06600	Annealed
35	72Ni-15Cr-8Fe	Wld. tube	SB-516	...	N06600	Annealed
36	72Ni-15Cr-8Fe	Forgings	SB-564	...	N06600	...
37	72Ni-15Cr-8Fe	Forgings	SB-564	...	N06600	Annealed
38	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.
39	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.
40	72Ni-15Cr-8Fe	Wld. pipe	SB-517	...	N06600	Cold drawn/ann.
41	72Ni-15Cr-8Fe	Wld. pipe	SB-517	...	N06600	Cold drawn/ann.
42	72Ni-15Cr-8Fe	Bar, rod	SB-166	...	N06600	Hot fin.
43	72Ni-15Cr-8Fe	Bar, rod	SB-166	...	N06600	Hot fin.
44	72Ni-15Cr-8Fe	Plate, sheet, strip	SB-168	...	N06600	Hot rolled
45	72Ni-15Cr-8Fe	Plate, sheet, strip	SB-168	...	N06600	Hot rolled

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	43	110	45	1650	NP	1800	650	NFN-24	G4, T16
2	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, T15
3	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G14, T16
4	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, G14, T15
5	...	43	110	45	1650	NP	1800	650	NFN-24	G4, T16
6	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, T15
7	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G14, T16
8	...	43	110	45	1650	NP	1800	650	NFN-24	G4, G5, G14, T15
9	...	43	100	40	NP	NP	800	650	NFN-14	G5, W12
10	...	43	100	40	NP	NP	800	650	NFN-14	...
11	...	43	100	40	NP	NP	800	650	NFN-14	G5
12	...	43	100	40	NP	NP	800	650	NFN-14	...
13	...	43	100	40	NP	NP	800	650	NFN-14	G5
14	...	43	100	40	NP	NP	800	650	NFN-14	G14
15	...	43	100	40	NP	NP	800	650	NFN-14	G5, G14
16	...	43	100	40	NP	NP	800	650	NFN-14	...
17	...	43	100	40	NP	NP	800	650	NFN-14	G5
18	...	43	100	40	NP	NP	800	650	NFN-14	G14
19	...	43	100	40	NP	NP	800	650	NFN-14	G5, G14
20	>5	43	75	25	NP	800	1200	650	NFN-4	T12
21	>5	43	75	25	NP	800	1200	650	NFN-4	G5, T11
22	...	43	80	30	800	NP	1200	650	NFN-4	G5, T11, W5, W12
23	>5	43	80	30	NP	800 (Cl. 3 only)	1200	650	NFN-4	T12
24	>5	43	80	30	NP	800 (Cl. 3 only)	1200	650	NFN-4	G5, T11
25	...	...	...	...	...	...	...	...	...	...
26	≤5	43	80	30	NP	800	1200	650	NFN-4	G5, T11
27	≤5	43	80	30	NP	NP	1200	650	NFN-4	T12
28	≤3	43	80	35	1200	800	1200	650	NFN-4	G5, T11
29	≤3	43	80	35	1200	NP	1200	650	NFN-4	T11
30	...	43	80	35	1200	800	1200	650	NFN-4	G5, T11
31	...	43	80	35	1200	NP	1200	650	NFN-4	T11
32	...	43	80	35	1200	800	1200	650	NFN-4	G5, T11
33	...	43	80	35	1200	NP	1200	650	NFN-4	T11
34	...	43	80	35	NP	NP	1200	650	NFN-4	G14, T11
35	...	43	80	35	NP	NP	1200	650	NFN-4	G5, G14, T11
36	...	43	80	35	NP	800	NP	NP	NFN-4	G5
37	...	43	80	35	NP	NP	1200	650	NFN-4	T11
38	≤5	43	80	35	1200	800 (Cl. 3 only)	1200	650	NFN-4	T11
39	≤5	43	80	35	1200	800	1200	650	NFN-4	G5, T11
40	...	43	80	35	NP	NP	1200	650	NFN-4	G14, T11
41	...	43	80	35	NP	NP	1200	650	NFN-4	G5, G14, T11
42	...	43	85	35	1200	800 (Cl. 3 only)	1200	650	NFN-4	T13
43	...	43	85	35	1200	800 (Cl. 3 only)	1200	650	NFN-4	G5, T12
44	...	43	85	35	1200	800 (Cl. 3 only)	1200	650	NFN-4	G20, T13
45	...	43	85	35	1200	800 (Cl. 3 only)	1200	650	NFN-4	G5, G20, T12

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	30.0	...	28.2	...	26.4	...	24.7	...	23.1	...	22.0	21.5	21.2	21.0	20.9	20.9	20.9	20.9
2	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.4	29.1	28.7	28.4	28.2	28.2	28.2	28.2
3	25.5	...	24.0	...	22.4	...	21.0	...	19.6	...	18.7	18.3	18.0	17.9	17.8	17.8	17.8	17.8
4	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	25.0	24.7	24.4	24.1	24.0	24.0	24.0	24.0
5	30.0	...	28.2	...	26.4	...	24.7	...	23.1	...	22.0	21.5	21.2	21.0	20.9	20.9	20.9	20.9
6	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.4	29.1	28.7	28.4	28.2	28.2	28.2	28.2
7	25.5	...	24.0	...	22.4	...	21.0	...	19.6	...	18.7	18.3	18.0	17.9	17.8	17.8	17.8	17.8
8	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	25.0	24.7	24.4	24.1	24.0	24.0	24.0	24.0
9	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.5	...	25.8	...	...	...
10	26.7	...	24.6	...	23.0	...	21.7	...	20.8	...	20.1	19.9	19.6	19.4	19.1	...	...	...
11	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.5	26.1	25.8	...	...	...
12	26.7	...	24.6	...	23.0	...	21.7	...	20.8	...	20.1	19.9	19.6	19.4	19.1	...	...	...
13	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.5	26.1	25.8	...	...	...
14	22.7	...	20.9	...	19.5	...	18.5	...	17.7	...	17.1	16.9	16.7	16.5	16.2	...	...	...
15	22.7	...	22.7	...	22.7	...	22.7	...	22.7	...	22.7	22.7	22.5	22.2	21.9	...	...	...
16	26.7	...	24.6	...	23.0	...	21.7	...	20.8	...	20.1	19.9	19.6	19.4	19.1	...	...	...
17	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.5	26.1	25.8	...	...	...
18	22.7	...	20.9	...	19.5	...	18.5	...	17.7	...	17.1	16.9	16.7	16.5	16.2	...	...	...
19	22.7	...	22.7	...	22.7	...	22.7	...	22.7	...	22.7	22.7	22.5	22.2	21.9	...	...	...
20	16.7	...	15.9	...	15.2	...	14.6	...	14.0	...	13.5	13.3	13.1	12.9	12.7	12.5	12.4	10.6
21	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.7	16.7	16.7	16.7	16.7	16.7	16.0	10.6
22	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	16.0	10.6
23	20.0	...	19.1	...	18.3	...	17.5	...	16.8	...	16.2	15.9	15.7	15.5	15.2	15.1	14.9	10.6
24	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	16.0	10.6
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	16.0	10.6
27	20.0	...	19.1	...	18.3	...	17.5	...	16.8	...	16.2	15.9	15.7	15.5	15.2	15.1	14.9	10.6
28	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.4	16.0	10.6
29	22.9	...	21.3	...	20.8	...	20.5	...	20.2	...	19.9	19.8	19.6	19.4	19.1	18.7	16.0	10.6
30	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.4	16.0	10.6
31	22.9	...	21.3	...	20.8	...	20.5	...	20.2	...	19.9	19.8	19.6	19.4	19.1	18.7	16.0	10.6
32	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.4	16.0	10.6
33	22.9	...	21.3	...	20.8	...	20.5	...	20.2	...	19.9	19.8	19.6	19.4	19.1	18.7	16.0	10.6
34	19.4	...	18.1	...	17.7	...	17.4	...	17.2	...	16.9	16.8	16.7	16.5	16.2	15.9	13.6	9.0
35	19.4	...	19.4	...	19.4	...	19.4	...	19.4	...	19.4	19.4	19.4	19.4	19.4	19.0	13.6	9.0
36	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	...	...	...
37	22.9	...	21.3	...	20.8	...	20.5	...	20.2	...	19.9	19.8	19.6	19.4	19.1	18.7	16.0	10.6
38	22.9	...	21.3	...	20.8	...	20.5	...	20.2	...	19.9	19.8	19.6	19.4	19.1	18.7	16.0	10.6
39	22.9	...	22.9	...	22.9	...	22.9	...	22.9	...	22.9	22.9	22.9	22.9	22.9	22.4	16.0	10.6
40	19.4	...	18.1	...	17.7	...	17.4	...	17.2	...	16.9	16.8	16.7	16.5	16.2	15.9	13.6	9.0
41	19.4	...	19.4	...	19.4	...	19.4	...	19.4	...	19.4	19.4	19.4	19.4	19.4	19.0	13.6	9.0
42	23.3	...	22.1	...	21.5	...	21.3	...	21.3	...	21.2	21.1	21.0	20.8	20.5	20.1	19.7	19.3
43	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3	23.3	23.3	20.4
44	23.3	...	22.1	...	21.5	...	21.3	...	21.3	...	21.2	21.1	21.0	20.8	20.5	20.1	19.7	19.3
45	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3	23.3	23.3	20.4

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	20.9	20.9	20.9	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
2	28.2	28.2	23.2	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
3	17.8	17.8	17.8	16.2	13.3	11.0	9.0	7.2	5.7	4.5	3.5	2.5	1.8	1.3	0.94	0.60	0.38
4	24.0	24.0	19.7	16.2	13.3	11.0	9.0	7.2	5.7	4.5	3.5	2.5	1.8	1.3	0.94	0.60	0.38
5	20.9	20.9	20.9	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
6	28.2	28.2	23.2	19.0	15.6	12.9	10.6	8.5	6.7	5.3	4.1	2.9	2.1	1.5	1.1	0.70	0.45
7	17.8	17.8	17.8	16.2	13.3	11.0	9.0	7.2	5.7	4.5	3.5	2.5	1.8	1.3	0.94	0.60	0.38
8	24.0	24.0	19.7	16.2	13.3	11.0	9.0	7.2	5.7	4.5	3.5	2.5	1.8	1.3	0.94	0.60	0.38
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
21	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
22	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
23	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
24	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
27	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
28	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
29	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
30	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
31	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
32	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
33	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
34	6.0	3.8	2.6	1.9	1.7	...	...	...	...	...	...	...	...	...	...	...	...
35	6.0	3.8	2.6	1.9	1.7	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
38	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
39	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...	...	...	...
40	6.0	3.8	2.6	1.9	1.7	...	...	...	...	...	...	...	...	...	...	...	...
41	6.0	3.8	2.6	1.9	1.7	...	...	...	...	...	...	...	...	...	...	...	...
42	14.5	10.3	7.2	5.8	5.5	...	...	...	...	...	...	...	...	...	...	...	...
43	14.5	10.3	7.2	5.8	5.5	...	...	...	...	...	...	...	...	...	...	...	...
44	14.5	10.3	7.2	5.8	5.5	...	...	...	...	...	...	...	...	...	...	...	...
45	14.5	10.3	7.2	5.8	5.5	...	...	...	...	...	...	...	...	...	...	...	...

(23)

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	60Ni-23Cr-Fe	Smls. tube	SB-163	...	N06601	Annealed
2	60Ni-23Cr-Fe	Smls. tube	SB-163	...	N06601	Annealed
3	60Ni-23Cr-Fe	Bar	SB-166	...	N06601	Annealed
4	60Ni-23Cr-Fe	Bar	SB-166	...	N06601	Annealed
5	60Ni-23Cr-Fe	Smls. pipe & tube	SB-167	...	N06601	Annealed
6	60Ni-23Cr-Fe	Smls. pipe & tube	SB-167	...	N06601	Annealed
7	60Ni-23Cr-Fe	Plate, sheet, strip	SB-168	...	N06601	Annealed
8	60Ni-23Cr-Fe	Plate, sheet, strip	SB-168	...	N06601	Annealed
9	52Ni-22Cr-13Co-9Mo	Bar, rod	SB-166	...	N06617	Annealed
10	52Ni-22Cr-13Co-9Mo	Bar, rod	SB-166	...	N06617	Annealed
11	52Ni-22Cr-13Co-9Mo	Smls. pipe & tube	SB-167	...	N06617	Annealed
12	52Ni-22Cr-13Co-9Mo	Smls. pipe & tube	SB-167	...	N06617	Annealed
(23) 13	52Ni-22Cr-13Co-9Mo	Wld. tube	SB-626	...	N06617	Solution ann.
(23) 14	52Ni-22Cr-13Co-9Mo	Wld. tube	SB-626	...	N06617	Solution ann.
15	52Ni-22Cr-13Co-9Mo	Plate, sheet, strip	SB-168	...	N06617	Annealed
16	52Ni-22Cr-13Co-9Mo	Plate, sheet, strip	SB-168	...	N06617	Annealed
17	52Ni-22Cr-13Co-9Mo	Forgings	SB-564	...	N06617	Annealed
18	52Ni-22Cr-13Co-9Mo	Forgings	SB-564	...	N06617	Annealed
(23) 19	60Ni-22Cr-9Mo-3.5Cb	Plate, sheet, strip	SB-443	2	N06625	Cold rolled/solution ann.
20	60Ni-22Cr-9Mo-3.5Cb	Plate, sheet	SB-443	2	N06625	Hot rolled/solution ann.
21	60Ni-22Cr-9Mo-3.5Cb	Smls. pipe & tube	SB-444	2	N06625	Solution ann.
22	60Ni-22Cr-9Mo-3.5Cb	Smls. pipe & tube	SB-444	2	N06625	Solution ann.
23	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	2	N06625	Solution ann.
24	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	2	N06625	Solution ann.
(23) 25	60Ni-22Cr-9Mo-3.5Cb	Smls. & wld. fittings	SB-366	...	N06625	Annealed
26	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	1	N06625	Annealed
27	60Ni-22Cr-9Mo-3.5Cb	Forgings	SB-564	...	N06625	Annealed
28	60Ni-22Cr-9Mo-3.5Cb	Plate	SB-443	1	N06625	Cold rolled/ann.
29	60Ni-22Cr-9Mo-3.5Cb	Plate, sheet	SB-443	1	N06625	Hot rolled/ann.
30	60Ni-22Cr-9Mo-3.5Cb	Sheet, strip	SB-443	1	N06625	Cold rolled/ann.
31	60Ni-22Cr-9Mo-3.5Cb	Smls. pipe	SB-444	1	N06625	Annealed
32	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	1	N06625	Annealed
33	60Ni-22Cr-9Mo-3.5Cb	Forgings	SB-564	...	N06625	Annealed
34	60Ni-22Cr-9Mo-3.5Cb	Wld. tube	SB-704	...	N06625	Annealed
35	60Ni-22Cr-9Mo-3.5Cb	Wld. pipe	SB-705	1	N06625	Annealed
36	Ni-Cr-Mo-W	Forged fittings	SB-462	...	N06686	Solution ann.
37	Ni-Cr-Mo-W	Forged fittings	SB-462	...	N06686	Solution ann.
38	Ni-Cr-Mo-W	Forgings	SB-564	...	N06686	Solution ann.
39	Ni-Cr-Mo-W	Forgings	SB-564	...	N06686	Solution ann.
40	Ni-Cr-Mo-W	Rod	SB-574	...	N06686	Solution ann.
41	Ni-Cr-Mo-W	Rod	SB-574	...	N06686	Solution ann.
42	Ni-Cr-Mo-W	Plate, sheet, strip	SB-575	...	N06686	Solution ann.
43	Ni-Cr-Mo-W	Plate, sheet, strip	SB-575	...	N06686	Solution ann.
44	Ni-Cr-Mo-W	Wld. pipe	SB-619	...	N06686	Solution ann.
45	Ni-Cr-Mo-W	Wld. pipe	SB-619	...	N06686	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	≤3 O.D.	43	80	30	1650	NP	1650	NP	NFN-4	G4, T14
2	≤3 O.D.	43	80	30	1650	NP	1650	NP	NFN-4	G4, G5, T13
3	...	43	80	30	1650	NP	1650	NP	NFN-4	G4, T14
4	...	43	80	30	1650	NP	1650	NP	NFN-4	G4, G5, T13
5	...	43	80	30	1650	NP	1650	NP	NFN-4	G4, T14
6	...	43	80	30	1650	NP	1650	NP	NFN-4	G4, G5, T13
7	...	43	80	30	1650	NP	1650	NP	NFN-4	G4, T14
8	...	43	80	30	1650	NP	1650	NP	NFN-4	G4, G5, T13
9	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, T18
10	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, G5, T17
11	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, T18
12	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, G5, T17
13	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, G14, T18
14	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, G5, G14, T17
15	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, T18
16	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, G5, T17
17	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, T18
18	...	43	95	35	1650	NP	1800	NP	NFN-4	G4, G5, T17
19	...	43	100	40	1100	NP	1600	650	NFN-22	G4, G5, G23, T17, W13
20	...	43	100	40	1100	NP	1600	650	NFN-22	G4, G23, T18, W13
21	...	43	100	40	1100	NP	1600	650	NFN-22	G4, G5, G23, T17, W13
22	...	43	100	40	1100	NP	1600	650	NFN-22	G4, G23, T18, W13
23	...	43	100	40	1100	NP	1600	650	NFN-22	G4, G5, G23, T17, W13
24	...	43	100	40	1100	NP	1600	650	NFN-22	G4, G23, T18, W13
25	...	43	110	50	1100	800	1200	650	NFN-17	G23, T16, W5, W12
26	4 < t ≤ 10	43	110	50	1100	800	1200	650	NFN-17	G23, T16
27	4 < t ≤ 10	43	110	50	1100	800	1200	650	NFN-17	G23, T16
28	≤0.375	43	110	55	1100	800	1200	650	NFN-17	G23, T16
29	≤2.75	43	110	55	1100	800	1200	650	NFN-17	G23, T16
30	...	43	120	60	1100	NP	1200	650	NFN-17	G22, G23, T16
31	...	43	120	60	1100	800	1200	650	NFN-17	G22, G23, T16
32	≤4	43	120	60	1100	800	1200	650	NFN-17	G22, G23, T16
33	≤4	43	120	60	1100	800	1200	650	NFN-17	G22, G23, T16
34	...	43	120	60	1100	800	1200	650	NFN-17	G14, G22, G23, T16
35	...	43	120	60	1100	NP	1200	650	NFN-17	G14, G22, G23, T16
36	≤3 ¹ / ₂	43	100	45	NP	NP	800	NP	NFN-10	G5
37	≤3 ¹ / ₂	43	100	45	NP	NP	800	NP	NFN-10	...
38	...	43	100	45	NP	NP	800	NP	NFN-10	G5
39	...	43	100	45	NP	NP	800	NP	NFN-10	...
40	≤3 ¹ / ₂	43	100	45	NP	NP	800	NP	NFN-10	G5
41	≤3 ¹ / ₂	43	100	45	NP	NP	800	NP	NFN-10	...
42	...	43	100	45	NP	NP	800	NP	NFN-10	G5
43	...	43	100	45	NP	NP	800	NP	NFN-10	...
44	≤8	43	100	45	NP	NP	800	NP	NFN-10	G5, G14
45	≤8	43	100	45	NP	NP	800	NP	NFN-10	G14

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	20.0	...	17.8	...	16.6	...	15.5	...	14.7	...	14.2	14.0	13.9	13.8	13.8	13.8	13.8	13.7
2	20.0	...	20.0	...	20.0	...	20.0	...	19.9	...	19.2	19.0	18.8	18.7	18.6	18.6	18.6	18.6
3	20.0	...	17.8	...	16.6	...	15.5	...	14.7	...	14.2	14.0	13.9	13.8	13.8	13.8	13.8	13.7
4	20.0	...	20.0	...	20.0	...	20.0	...	19.9	...	19.2	19.0	18.8	18.7	18.6	18.6	18.6	18.6
5	20.0	...	17.8	...	16.6	...	15.5	...	14.7	...	14.2	14.0	13.9	13.8	13.8	13.8	13.8	13.7
6	20.0	...	20.0	...	20.0	...	20.0	...	19.9	...	19.2	19.0	18.8	18.7	18.6	18.6	18.6	18.6
7	20.0	...	17.8	...	16.6	...	15.5	...	14.7	...	14.2	14.0	13.9	13.8	13.8	13.8	13.8	13.7
8	20.0	...	20.0	...	20.0	...	20.0	...	19.9	...	19.2	19.0	18.8	18.7	18.6	18.6	18.6	18.6
9	23.3	...	20.8	...	19.2	...	18.1	...	17.2	...	16.6	16.4	16.2	16.0	15.9	15.8	15.7	15.6
10	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.5	22.1	21.9	21.7	21.5	21.3	21.2	21.0
11	23.3	...	20.8	...	19.2	...	18.1	...	17.2	...	16.6	16.4	16.2	16.0	15.9	15.8	15.7	15.6
12	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.5	22.1	21.9	21.7	21.5	21.3	21.2	21.0
13	19.8	...	17.7	...	16.3	...	15.4	...	14.6	...	14.1	13.9	13.8	13.6	13.5	13.4	13.3	13.3
14	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.1	18.8	18.6	18.4	18.3	18.1	18.0	17.9
15	23.3	...	20.8	...	19.2	...	18.1	...	17.2	...	16.6	16.4	16.2	16.0	15.9	15.8	15.7	15.6
16	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.5	22.1	21.9	21.7	21.5	21.3	21.2	21.0
17	23.3	...	20.8	...	19.2	...	18.1	...	17.2	...	16.6	16.4	16.2	16.0	15.9	15.8	15.7	15.6
18	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	22.5	22.1	21.9	21.7	21.5	21.3	21.2	21.0
19	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.6
20	26.7	...	24.6	...	23.4	...	22.4	...	21.7	...	21.0	20.8	20.5	20.3	20.1	20.0	19.8	19.7
21	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.6
22	26.7	...	24.6	...	23.4	...	22.4	...	21.7	...	21.0	20.8	20.5	20.3	20.1	20.0	19.8	19.7
23	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.6
24	26.7	...	24.6	...	23.4	...	22.4	...	21.7	...	21.0	20.8	20.5	20.3	20.1	20.0	19.8	19.7
25	31.4	...	31.4	...	31.4	...	30.8	...	30.2	...	29.7	29.4	29.1	28.9	28.6	28.3	28.0	27.7
26	31.4	...	31.4	...	31.4	...	30.8	...	30.2	...	29.7	29.4	29.1	28.9	28.6	28.3	28.0	27.7
27	31.4	...	31.4	...	31.4	...	30.8	...	30.2	...	29.7	29.4	29.1	28.9	28.6	28.3	28.0	27.7
28	31.4	...	31.4	...	31.4	...	30.8	...	30.2	...	29.7	29.4	29.1	28.9	28.6	28.3	28.0	27.7
29	31.4	...	31.4	...	31.4	...	30.8	...	30.2	...	29.7	29.4	29.1	28.9	28.6	28.3	28.0	27.7
30	34.3	...	34.3	...	34.3	...	33.6	...	32.9	...	32.4	32.1	31.8	31.5	31.2	30.9	30.6	30.3
31	34.3	...	34.3	...	34.3	...	33.6	...	32.9	...	32.4	32.1	31.8	31.5	31.2	30.9	30.6	30.3
32	34.3	...	34.3	...	34.3	...	33.6	...	32.9	...	32.4	32.1	31.8	31.5	31.2	30.9	30.6	30.3
33	34.3	...	34.3	...	34.3	...	33.6	...	32.9	...	32.4	32.1	31.8	31.5	31.2	30.9	30.6	30.3
34	29.1	...	29.1	...	29.1	...	28.5	...	28.0	...	27.5	27.3	27.0	26.8	26.5	26.3	26.0	25.7
35	29.1	...	29.1	...	29.1	...	28.5	...	28.0	...	27.5	27.3	27.0	26.8	26.5	26.3	26.0	25.7
36	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	25.9	25.7	25.4	25.2	24.9	...	...	...
37	28.6	...	24.9	...	23.4	...	22.5	...	21.6	...	20.8	20.4	20.1	19.9	19.9	...	...	...
38	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	25.9	25.7	25.4	25.2	24.9	...	...	...
39	28.6	...	24.9	...	23.4	...	22.5	...	21.6	...	20.8	20.4	20.1	19.9	19.9	...	...	...
40	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	25.9	25.7	25.4	25.2	24.9	...	...	...
41	28.6	...	24.9	...	23.4	...	22.5	...	21.6	...	20.8	20.4	20.1	19.9	19.9	...	...	...
42	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	25.9	25.7	25.4	25.2	24.9	...	...	...
43	28.6	...	24.9	...	23.4	...	22.5	...	21.6	...	20.8	20.4	20.1	19.9	19.9	...	...	...
44	24.3	...	24.3	...	24.0	...	23.1	...	22.5	...	22.0	21.8	21.6	21.4	21.2	...	...	...
45	24.3	...	21.2	...	19.9	...	19.1	...	18.4	...	17.7	17.3	17.1	16.9	16.9	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	13.7	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
2	17.6	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
3	13.7	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
4	17.6	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
5	13.7	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
6	17.6	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
7	13.7	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
8	17.6	13.6	10.4	8.0	6.1	4.6	3.6	2.8	2.1	1.7	1.3	1.1	0.87	0.71	...	...	...
9	15.5	15.4	15.4	15.3	15.3	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
10	20.9	20.9	20.8	20.7	18.1	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
11	15.5	15.4	15.4	15.3	15.3	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
12	20.9	20.9	20.8	20.7	18.1	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
13	13.2	13.1	13.1	13.1	13.0	12.3	9.5	7.4	5.6	4.3	3.3	2.6	2.0	1.5	1.2	0.9	0.62 (23)
14	17.8	17.8	17.7	17.6	15.4	12.3	9.5	7.4	5.6	4.3	3.3	2.6	2.0	1.5	1.2	0.9	0.62 (23)
15	15.5	15.4	15.4	15.3	15.3	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
16	20.9	20.9	20.8	20.7	18.1	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
17	15.5	15.4	15.4	15.3	15.3	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
18	20.9	20.9	20.8	20.7	18.1	14.5	11.2	8.7	6.6	5.1	3.9	3.0	2.3	1.8	1.4	1.1	0.73
19	26.4	26.3	26.2	26.1	20.0	15.0	11.6	8.5	6.7	4.9	3.8	2.6	1.9	...	...	...	(23)
20	19.6	19.5	19.4	19.3	19.3	15.0	11.6	8.5	6.7	4.9	3.8	2.6	1.9	...	...	...	...
21	26.4	26.3	26.2	26.1	20.0	15.0	11.6	8.5	6.7	4.9	3.8	2.6	1.9	...	...	...	...
22	19.6	19.5	19.4	19.3	19.3	15.0	11.6	8.5	6.7	4.9	3.8	2.6	1.9	...	...	...	...
23	26.4	26.3	26.2	26.1	20.0	15.0	11.6	8.5	6.7	4.9	3.8	2.6	1.9	...	...	...	...
24	19.6	19.5	19.4	19.3	19.3	15.0	11.6	8.5	6.7	4.9	3.8	2.6	1.9	...	...	...	...
25	27.4	27.0	26.6	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	(23)
26	27.4	27.0	26.6	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
27	27.4	27.0	26.6	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
28	27.4	27.0	26.6	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
29	27.4	27.0	26.6	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
30	29.9	29.5	29.0	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
31	29.9	29.5	29.0	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
32	29.9	29.5	29.0	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
33	29.9	29.5	29.0	21.0	13.2	...	...	...	...	...	...	...	...	...	...	...	...
34	25.4	25.1	24.7	17.9	11.2	...	...	...	...	...	...	...	...	...	...	...	...
35	25.4	25.1	24.7	17.9	11.2	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	Ni-Cr-Mo-W	Smls. pipe & tube	SB-622	...	N06686	Solution ann.
2	Ni-Cr-Mo-W	Smls. pipe & tube	SB-622	...	N06686	Solution ann.
3	Ni-Cr-Mo-W	Wld. tube	SB-626	...	N06686	Solution ann.
4	Ni-Cr-Mo-W	Wld. tube	SB-626	...	N06686	Solution ann.
5	58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Annealed
6	58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Annealed
7	58Ni-29Cr-9Fe	Plate, sheet, strip	SB-168	...	N06690	Annealed
8	58Ni-29Cr-9Fe	Plate, sheet, strip	SB-168	...	N06690	Annealed
9	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold drawn/ann.
10	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold drawn/ann.
11	49Ni-25Cr-18Fe-6Mo	Plate, sheet, strip	SB-582	...	N06975	Solution ann.
12	49Ni-25Cr-18Fe-6Mo	Plate, sheet, strip	SB-582	...	N06975	Solution ann.
13	49Ni-25Cr-18Fe-6Mo	Wld. pipe	SB-619	...	N06975	Solution ann.
14	49Ni-25Cr-18Fe-6Mo	Wld. pipe	SB-619	...	N06975	Solution ann.
15	49Ni-25Cr-18Fe-6Mo	Smls. pipe & tube	SB-622	...	N06975	Solution ann.
16	49Ni-25Cr-18Fe-6Mo	Smls. pipe & tube	SB-622	...	N06975	Solution ann.
17	49Ni-25Cr-18Fe-6Mo	Wld. tube	SB-626	...	N06975	Solution ann.
18	49Ni-25Cr-18Fe-6Mo	Wld. tube	SB-626	...	N06975	Solution ann.
19	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed
20	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed
21	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed
22	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed
23	47Ni-22Cr-20Fe-7Mo	Smls. & wld. fittings	SB-366	...	N06985	Annealed
24	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed
25	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed
26	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed
27	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed
28	47Ni-22Cr-20Fe-7Mo	Wld. pipe	SB-619	...	N06985	Annealed
29	47Ni-22Cr-20Fe-7Mo	Wld. pipe	SB-619	...	N06985	Annealed
30	47Ni-22Cr-20Fe-7Mo	Smls. pipe & tube	SB-622	...	N06985	Annealed
31	47Ni-22Cr-20Fe-7Mo	Smls. pipe & tube	SB-622	...	N06985	Annealed
32	47Ni-22Cr-20Fe-7Mo	Wld. tube	SB-626	...	N06985	Annealed
33	47Ni-22Cr-20Fe-7Mo	Wld. tube	SB-626	...	N06985	Annealed
34	35Ni-35Fe-20Cr-Cb	Forgings	SB-462	...	N08020	Annealed
35	35Ni-35Fe-20Cr-Cb	Forgings	SB-462	...	N08020	Annealed
36	35Ni-35Fe-20Cr-Cb	Plate	SB-463	...	N08020	Annealed
37	35Ni-35Fe-20Cr-Cb	Plate	SB-463	...	N08020	Annealed
38	35Ni-35Fe-20Cr-Cb	Bar	SB-473	...	N08020	Annealed
39	35Ni-35Fe-20Cr-Cb	Bar	SB-473	...	N08020	Annealed
40	35Ni-35Fe-20Cr-Cb	Smls. pipe & tube	SB-729	...	N08020	Annealed
41	35Ni-35Fe-20Cr-Cb	Smls. pipe & tube	SB-729	...	N08020	Annealed
42	35Ni-35Fe-20Cr-Cb	Wld. pipe	SB-464	...	N08020	Wld. ann.
43	35Ni-35Fe-20Cr-Cb	Wld. pipe	SB-464	...	N08020	Wld. ann.
44	35Ni-35Fe-20Cr-Cb	Wld. pipe	SB-464	...	N08020	Wld. ann.
45	35Ni-35Fe-20Cr-Cb	Wld. tube	SB-468	...	N08020	Wld. ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	43	100	45	NP	NP	800	NP	NFN-10	G5
2	...	43	100	45	NP	NP	800	NP	NFN-10	...
3	$\leq 3\frac{1}{2}$	43	100	45	NP	NP	800	NP	NFN-10	G5, G14
4	$\leq 3\frac{1}{2}$	43	100	45	NP	NP	800	NP	NFN-10	G14
5	...	43	85	35	NP	NP	850	650	NFN-4	...
6	...	43	85	35	NP	NP	850	650	NFN-4	G5
7	...	43	85	35	NP	NP	850	650	NFN-4	...
8	...	43	85	35	NP	NP	850	650	NFN-4	G5
9	...	43	85	35	1200	NP	850	650	NFN-4	H3, T12
10	...	43	85	35	1200	NP	850	650	NFN-4	G5, H3, T12
11	...	45	85	32	NP	NP	800	650	NFN-11	...
12	...	45	85	32	NP	NP	800	650	NFN-11	G5
13	...	45	85	32	NP	NP	800	650	NFN-11	G14
14	...	45	85	32	NP	NP	800	650	NFN-11	G5, G14
15	...	45	85	32	NP	NP	800	650	NFN-11	...
16	...	45	85	32	NP	NP	800	650	NFN-11	G5
17	...	45	85	32	NP	NP	800	650	NFN-11	G14
18	...	45	85	32	NP	NP	800	650	NFN-11	G5, G14
19	$> \frac{3}{4}$	45	85	30	NP	NP	800	650	NFN-19	...
20	$> \frac{3}{4}$	45	85	30	NP	NP	800	650	NFN-19	G5
21	$> \frac{3}{4}$	45	85	30	NP	NP	800	650	NFN-19	...
22	$> \frac{3}{4}$	45	85	30	NP	NP	800	650	NFN-19	G5
23	...	45	90	35	NP	NP	800	650	NFN-18	G5, W12
24	$\leq \frac{3}{4}$	45	90	35	NP	NP	800	650	NFN-18	...
25	$\leq \frac{3}{4}$	45	90	35	NP	NP	800	650	NFN-18	G5
26	$\leq \frac{3}{4}$	45	90	35	NP	NP	800	650	NFN-18	...
27	$\leq \frac{3}{4}$	45	90	35	NP	NP	800	650	NFN-18	G5
28	...	45	90	35	NP	NP	800	650	NFN-18	G14
29	...	45	90	35	NP	NP	800	650	NFN-18	G5, G14
30	...	45	90	35	NP	NP	800	650	NFN-18	...
31	...	45	90	35	NP	NP	800	650	NFN-18	G5
32	...	45	90	35	NP	NP	800	650	NFN-18	G14
33	...	45	90	35	NP	NP	800	650	NFN-18	G5, G14
34	...	45	80	35	NP	800	800	650	NFN-12	G5
35	...	45	80	35	NP	NP	800	650	NFN-12	...
36	...	45	80	35	NP	NP	800	650	NFN-12	...
37	...	45	80	35	NP	800	800	650	NFN-12	G5
38	...	45	80	35	NP	800	800	650	NFN-12	G5
39	...	45	80	35	NP	NP	800	650	NFN-12	...
40	...	45	80	35	NP	NP	800	650	NFN-12	...
41	...	45	80	35	NP	NP	800	650	NFN-12	G5
42	...	45	80	35	NP	800	NP	NP	NFN-12	G5, W5
43	...	45	80	35	NP	NP	800	650	NFN-12	G14
44	...	45	80	35	NP	NP	800	650	NFN-12	G5, G14
45	...	45	80	35	NP	800	NP	NP	NFN-12	G5, W5

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	28.6	...	28.6	...	28.2	...	27.2	...	26.5	...	25.9	25.7	25.4	25.2	24.9	...	...	...
2	28.6	...	24.9	...	23.4	...	22.5	...	21.6	...	20.8	20.4	20.1	19.9	19.9	...	...	...
3	24.3	...	24.3	...	24.0	...	23.1	...	22.5	...	22.0	21.8	21.6	21.4	21.2	...	...	...
4	24.3	...	21.2	...	19.9	...	19.1	...	18.4	...	17.7	17.3	17.1	16.9	16.9	...	...	...
5	23.3	...	21.1	...	19.9	...	19.1	...	18.6	...	18.4	18.4	18.4	18.4	18.4	18.4	...	...
6	23.3	...	23.3	...	23.3	...	23.3	...	23.1	...	22.9	22.9	22.8	22.7	22.6	22.5	...	...
7	23.3	...	21.1	...	19.9	...	19.1	...	18.6	...	18.4	18.4	18.4	18.4	18.4	18.4	...	...
8	23.3	...	23.3	...	23.3	...	23.3	...	23.1	...	22.9	22.9	22.8	22.7	22.6	22.5	...	...
9	23.3	...	21.1	...	19.9	...	19.1	...	18.6	...	18.4	18.4	18.4	18.4	18.4	18.4	18.3	16.5
10	23.3	...	23.3	...	23.3	...	23.3	...	23.1	...	22.9	22.9	22.8	22.7	22.6	22.5	22.2	16.5
11	21.3	...	19.5	...	18.5	...	17.5	...	16.5	...	15.6	15.3	15.0	14.8	14.7	...	...	...
12	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	21.1	20.6	20.2	20.0	19.8	...	...	...
13	18.1	...	16.6	...	15.7	...	14.9	...	14.0	...	13.3	13.0	12.7	12.6	12.5	...	...	...
14	18.1	...	18.1	...	18.1	...	18.1	...	18.1	...	17.9	17.5	17.2	17.0	16.8	...	...	...
15	21.3	...	19.5	...	18.5	...	17.5	...	16.5	...	15.6	15.3	15.0	14.8	14.7	...	...	...
16	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	21.1	20.6	20.2	20.0	19.8	...	...	...
17	18.1	...	16.6	...	15.7	...	14.9	...	14.0	...	13.3	13.0	12.7	12.6	12.5	...	...	...
18	18.1	...	18.1	...	18.1	...	18.1	...	18.1	...	17.9	17.5	17.2	17.0	16.8	...	...	...
19	20.0	...	17.8	...	16.2	...	14.9	...	13.9	...	13.1	12.8	12.5	12.3	12.0	...	...	...
20	20.0	...	20.0	...	20.0	...	20.0	...	18.8	...	17.7	17.3	16.9	16.5	16.2	...	...	...
21	20.0	...	17.8	...	16.2	...	14.9	...	13.9	...	13.1	12.8	12.5	12.3	12.0	...	...	...
22	20.0	...	20.0	...	20.0	...	20.0	...	18.8	...	17.7	17.3	16.9	16.5	16.2	...	...	...
23	23.3	...	23.3	...	23.3	...	23.3	...	21.9	...	20.7	20.2	19.7	19.3	18.9	...	...	...
24	23.3	...	20.8	...	18.9	...	17.4	...	16.2	...	15.3	14.9	14.6	14.3	14.0	...	...	...
25	23.3	...	23.3	...	23.3	...	23.3	...	21.9	...	20.7	20.2	19.7	19.3	18.9	...	...	...
26	23.3	...	20.8	...	18.9	...	17.4	...	16.2	...	15.3	14.9	14.6	14.3	14.0	...	...	...
27	23.3	...	23.3	...	23.3	...	23.3	...	21.9	...	20.7	20.2	19.7	19.3	18.9	...	...	...
28	19.8	...	17.7	...	16.1	...	14.8	...	13.8	...	13.0	12.7	12.4	12.1	11.9	...	...	...
29	19.8	...	19.8	...	19.8	...	19.8	...	18.6	...	17.6	17.1	16.8	16.4	16.1	...	...	...
30	23.3	...	20.8	...	18.9	...	17.4	...	16.2	...	15.3	14.9	14.6	14.3	14.0	...	...	...
31	23.3	...	23.3	...	23.3	...	23.3	...	21.9	...	20.7	20.2	19.7	19.3	18.9	...	...	...
32	19.8	...	17.7	...	16.1	...	14.8	...	13.8	...	13.0	12.7	12.4	12.1	11.9	...	...	...
33	19.8	...	19.8	...	19.8	...	19.8	...	18.6	...	17.6	17.1	16.8	16.4	16.1	...	...	...
34	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...
35	22.9	...	20.6	...	19.7	...	18.9	...	18.2	...	17.7	17.5	17.4	17.2	16.8	...	...	...
36	22.9	...	20.6	...	19.7	...	18.9	...	18.2	...	17.7	17.5	17.4	17.2	16.8	...	...	...
37	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...
38	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...
39	22.9	...	20.6	...	19.7	...	18.9	...	18.2	...	17.7	17.5	17.4	17.2	16.8	...	...	...
40	22.9	...	20.6	...	19.7	...	18.9	...	18.2	...	17.7	17.5	17.4	17.2	16.8	...	...	...
41	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...
42	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...
43	19.4	...	17.5	...	16.7	...	16.1	...	15.5	...	15.0	14.9	14.8	14.6	14.3	...	...	...
44	19.4	...	19.4	...	19.2	...	18.8	...	18.8	...	18.8	18.7	18.6	18.5	18.5	...	...	...
45	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	11.6	9.0	6.5	4.5	3.0	...	...	...	...	...	...	...	...	...	...	...	...
10	11.6	9.0	6.5	4.5	3.0	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	35Ni-35Fe-20Cr-Cb	Wld. tube	SB-468	...	N08020	Wld. ann.
2	35Ni-35Fe-20Cr-Cb	Wld. tube	SB-468	...	N08020	Wld. ann.
(23) 3	35Ni-35Fe-20Cr-Cb	Smls. & wld. fittings	SB-366	...	N08020	Annealed
(23) 4	37Ni-33Fe-23Cr-4Mo-Cu	Wld. pipe	SB-464	...	N08024	Wld. ann.
(23) 5	37Ni-33Fe-23Cr-4Mo-Cu	Wld. pipe	SB-464	...	N08024	Wld. ann.
(23) 6	37Ni-33Fe-23Cr-4Mo-Cu	Wld. tube	SB-468	...	N08024	Wld. ann.
(23) 7	37Ni-33Fe-23Cr-4Mo-Cu	Wld. tube	SB-468	...	N08024	Wld. ann.
(23) 8	35Ni-30Fe-24Cr-6Mo-Cu	Wld. pipe	SB-464	...	N08026	Wld. ann.
(23) 9	35Ni-30Fe-24Cr-6Mo-Cu	Wld. pipe	SB-464	...	N08026	Wld. ann.
(23) 10	35Ni-30Fe-24Cr-6Mo-Cu	Wld. tube	SB-468	...	N08026	Wld. ann.
(23) 11	35Ni-30Fe-24Cr-6Mo-Cu	Wld. tube	SB-468	...	N08026	Wld. ann.
12	31Ni-31Fe-29Cr-Mo	Smls. tube	SB-668	...	N08028	Annealed
13	31Ni-31Fe-29Cr-Mo	Smls. tube	SB-668	...	N08028	Annealed
14	31Ni-31Fe-29Cr-Mo	Plate, sheet, strip	SB-709	...	N08028	Annealed
15	31Ni-31Fe-29Cr-Mo	Plate, sheet, strip	SB-709	...	N08028	Annealed
16	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. & wld. fittings	SB-366	...	N08031	Solution ann.
17	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Forged fittings	SB-462	...	N08031	Solution ann.
18	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Forged fittings	SB-462	...	N08031	Solution ann.
19	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Forgings	SB-564	...	N08031	Solution ann.
20	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Forgings	SB-564	...	N08031	Solution ann.
21	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Rod	SB-581	...	N08031	Solution ann.
22	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Rod	SB-581	...	N08031	Solution ann.
23	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. pipe	SB-619	...	N08031	Solution ann.
24	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. pipe	SB-619	...	N08031	Solution ann.
25	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. pipe & tube	SB-622	...	N08031	Solution ann.
26	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. pipe & tube	SB-622	...	N08031	Solution ann.
27	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08031	Solution ann.
28	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08031	Solution ann.
29	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. tube	SB-626	...	N08031	Solution ann.
30	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. tube	SB-626	...	N08031	Solution ann.
31	37Ni-33Fe-25Cr	Condenser tube	SB-163	...	N08120	Solution ann.
32	37Ni-33Fe-25Cr	Condenser tube	SB-163	...	N08120	Solution ann.
33	37Ni-33Fe-25Cr	Smls. & wld. fittings	SB-366	...	N08120	Solution ann.
34	37Ni-33Fe-25Cr	Smls. pipe & tube	SB-407	...	N08120	Solution ann.
35	37Ni-33Fe-25Cr	Smls. pipe & tube	SB-407	...	N08120	Solution ann.
36	37Ni-33Fe-25Cr	Bar, rod	SB-408	...	N08120	Solution ann.
37	37Ni-33Fe-25Cr	Bar, rod	SB-408	...	N08120	Solution ann.
38	37Ni-33Fe-25Cr	Plate, sheet, strip	SB-409	...	N08120	Solution ann.
39	37Ni-33Fe-25Cr	Plate, sheet, strip	SB-409	...	N08120	Solution ann.
40	37Ni-33Fe-25Cr	Wld. pipe	SB-514	...	N08120	Solution ann.
41	37Ni-33Fe-25Cr	Wld. pipe	SB-514	...	N08120	Solution ann.
42	37Ni-33Fe-25Cr	Wld. tube	SB-515	...	N08120	Solution ann.
43	37Ni-33Fe-25Cr	Wld. tube	SB-515	...	N08120	Solution ann.
44	37Ni-33Fe-25Cr	Forgings	SB-564	...	N08120	Solution ann.
45	37Ni-33Fe-25Cr	Forgings	SB-564	...	N08120	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	45	80	35	NP	NP	800	650	NFN-12	G14
2	...	45	80	35	NP	NP	800	650	NFN-12	G5, G14
3	...	45	85	40	NP	800	800	650	NFN-12	G5, W5, W12
4	...	45	80	35	NP	NP	NP	650	NFN-13	G14
5	...	45	80	35	NP	NP	NP	650	NFN-13	G5, G14
6	...	45	80	35	NP	NP	NP	650	NFN-13	G14
7	...	45	80	35	NP	NP	NP	650	NFN-13	G5, G14
8	...	45	80	35	NP	NP	NP	650	NFN-13	G14
9	...	45	80	35	NP	NP	NP	650	NFN-13	G5, G14
10	...	45	80	35	NP	NP	NP	650	NFN-13	G14
11	...	45	80	35	NP	NP	NP	650	NFN-13	G5, G14
12	...	45	73	31	NP	600	850	650	NFN-13	...
13	...	45	73	31	NP	600	850	650	NFN-13	G5
14	...	45	73	31	NP	NP	850	650	NFN-13	...
15	...	45	73	31	NP	NP	850	650	NFN-13	G5
16	...	45	94	40	NP	NP	800	NP	NFN-11	G5, W12
17	...	45	94	40	NP	NP	800	NP	NFN-11	...
18	...	45	94	40	NP	NP	800	NP	NFN-11	G5
19	...	45	94	40	NP	NP	800	NP	NFN-11	...
20	...	45	94	40	NP	NP	800	NP	NFN-11	G5
21	...	45	94	40	NP	NP	800	NP	NFN-11	...
22	...	45	94	40	NP	NP	800	NP	NFN-11	G5
23	...	45	94	40	NP	NP	800	NP	NFN-11	G14
24	...	45	94	40	NP	NP	800	NP	NFN-11	G5, G14
25	...	45	94	40	NP	NP	800	NP	NFN-11	...
26	...	45	94	40	NP	NP	800	NP	NFN-11	G5
27	...	45	94	40	NP	NP	800	NP	NFN-11	...
28	...	45	94	40	NP	NP	800	NP	NFN-11	G5
29	...	45	94	40	NP	NP	800	NP	NFN-11	G14
30	...	45	94	40	NP	NP	800	NP	NFN-11	G5, G14
31	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G14, T16
32	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, G14, T15
33	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, T15, W12
34	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, T16
35	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, T15
36	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, T16
37	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, T15
38	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, T16
39	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, T15
40	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G14, T16
41	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, G14, T15
42	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G14, T16
43	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, G14, T15
44	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, T16
45	...	45	90	40	NP	NP	1650	NP	NFN-9	G4, G5, T15

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	19.4	...	17.5	...	16.7	...	16.1	...	15.5	...	15.0	14.9	14.8	14.6	14.3	...	...	...
2	19.4	...	19.4	...	19.2	...	18.8	...	18.8	...	18.8	18.7	18.6	18.5	18.5	...	...	...
3	22.9	...	22.9	...	22.6	...	22.2	...	22.1	...	22.1	22.0	21.9	21.8	21.8	...	...	...
4	19.4	...	17.5	...	16.3	...	15.4	...	14.5	...	13.6	13.2	12.9	12.6	12.4	...	...	...
5	19.4	...	19.4	...	19.2	...	18.6	...	18.2	...	17.7	17.5	17.3	17.0	16.7	...	...	...
6	19.4	...	17.5	...	16.3	...	15.4	...	14.5	...	13.6	13.2	12.9	12.6	12.4	...	...	...
7	19.4	...	19.4	...	19.2	...	18.6	...	18.2	...	17.7	17.5	17.3	17.0	16.7	...	...	...
8	19.4	...	17.6	...	16.1	...	14.9	...	13.8	...	13.0	12.7	12.4	12.1	11.9	...	...	...
9	19.4	...	19.4	...	19.1	...	18.5	...	18.0	...	17.5	17.1	16.7	16.3	16.0	...	...	...
10	19.4	...	17.6	...	16.1	...	14.9	...	13.8	...	13.0	12.7	12.4	12.1	11.9	...	...	...
11	19.4	...	19.4	...	19.1	...	18.5	...	18.0	...	17.5	17.1	16.7	16.3	16.0	...	...	...
12	20.7	...	18.9	...	17.7	...	16.5	...	15.4	...	14.4	14.0	13.6	13.1	12.8	12.4	...	...
13	20.7	...	20.7	...	20.1	...	19.3	...	18.7	...	18.2	18.0	17.8	17.5	17.2	16.7	...	...
14	20.7	...	18.9	...	17.7	...	16.5	...	15.4	...	14.4	14.0	13.6	13.1	12.8	12.4	...	...
15	20.7	...	20.7	...	20.1	...	19.3	...	18.7	...	18.2	18.0	17.8	17.5	17.2	16.7	...	...
16	26.7	...	26.7	...	25.8	...	24.5	...	23.3	...	22.2	21.7	21.3	20.9	20.5	...	...	...
17	26.7	...	22.0	...	19.8	...	18.3	...	17.3	...	16.4	16.1	15.8	15.5	15.2	...	...	...
18	26.7	...	26.7	...	25.8	...	24.5	...	23.3	...	22.2	21.7	21.3	20.9	20.5	...	...	...
19	26.7	...	22.0	...	19.8	...	18.3	...	17.3	...	16.4	16.1	15.8	15.5	15.2	...	...	...
20	26.7	...	26.7	...	25.8	...	24.5	...	23.3	...	22.2	21.7	21.3	20.9	20.5	...	...	...
21	26.7	...	22.0	...	19.8	...	18.3	...	17.3	...	16.4	16.1	15.8	15.5	15.2	...	...	...
22	26.7	...	26.7	...	25.8	...	24.5	...	23.3	...	22.2	21.7	21.3	20.9	20.5	...	...	...
23	22.7	...	18.7	...	16.8	...	15.6	...	14.7	...	13.9	13.7	13.4	13.2	12.9	...	...	...
24	22.7	...	22.7	...	21.9	...	20.8	...	19.8	...	18.9	18.4	18.1	17.8	17.4	...	...	...
25	26.7	...	22.0	...	19.8	...	18.3	...	17.3	...	16.4	16.1	15.8	15.5	15.2	...	...	...
26	26.7	...	26.7	...	25.8	...	24.5	...	23.3	...	22.2	21.7	21.3	20.9	20.5	...	...	...
27	26.7	...	22.0	...	19.8	...	18.3	...	17.3	...	16.4	16.1	15.8	15.5	15.2	...	...	...
28	26.7	...	26.7	...	25.8	...	24.5	...	23.3	...	22.2	21.7	21.3	20.9	20.5	...	...	...
29	22.7	...	18.7	...	16.8	...	15.6	...	14.7	...	13.9	13.7	13.4	13.2	12.9	...	...	...
30	22.7	...	22.7	...	21.9	...	20.8	...	19.8	...	18.9	18.4	18.1	17.8	17.4	...	...	...
31	25.7	...	23.5	...	21.6	...	19.9	...	18.6	...	17.7	17.3	17.0	16.8	16.6	16.5	16.4	16.3
32	25.7	...	25.7	...	25.0	...	24.2	...	23.7	...	23.5	23.4	23.0	22.7	22.4	22.3	22.2	22.1
33	25.7	...	25.7	...	25.0	...	24.2	...	23.7	...	23.5	23.4	23.0	22.7	22.4	22.3	22.2	22.1
34	25.7	...	23.5	...	21.6	...	19.9	...	18.6	...	17.7	17.3	17.0	16.8	16.6	16.5	16.4	16.3
35	25.7	...	25.7	...	25.0	...	24.2	...	23.7	...	23.5	23.4	23.0	22.7	22.4	22.3	22.2	22.1
36	25.7	...	23.5	...	21.6	...	19.9	...	18.6	...	17.7	17.3	17.0	16.8	16.6	16.5	16.4	16.3
37	25.7	...	25.7	...	25.0	...	24.2	...	23.7	...	23.5	23.4	23.0	22.7	22.4	22.3	22.2	22.1
38	25.7	...	23.5	...	21.6	...	19.9	...	18.6	...	17.7	17.3	17.0	16.8	16.6	16.5	16.4	16.3
39	25.7	...	25.7	...	25.0	...	24.2	...	23.7	...	23.5	23.4	23.0	22.7	22.4	22.3	22.2	22.1
40	21.8	...	20.0	...	18.4	...	16.9	...	15.8	...	15.0	14.7	14.5	14.3	14.1	14.0	13.9	13.9
41	21.8	...	21.8	...	21.3	...	20.6	...	20.1	...	20.0	19.9	19.6	19.3	19.0	19.0	18.9	18.8
42	21.8	...	20.0	...	18.4	...	16.9	...	15.8	...	15.0	14.7	14.5	14.3	14.1	14.0	13.9	13.9
43	21.8	...	21.8	...	21.3	...	20.6	...	20.1	...	20.0	19.9	19.6	19.3	19.0	19.0	18.9	18.8
44	25.7	...	23.5	...	21.6	...	19.9	...	18.6	...	17.7	17.3	17.0	16.8	16.6	16.5	16.4	16.3
45	25.7	...	25.7	...	25.0	...	24.2	...	23.7	...	23.5	23.4	23.0	22.7	22.4	22.3	22.2	22.1

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	16.3	16.3	16.2	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
32	22.0	21.9	17.9	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
33	22.0	21.9	17.9	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
34	16.3	16.3	16.2	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
35	22.0	21.9	17.9	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
36	16.3	16.3	16.2	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
37	22.0	21.9	17.9	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
38	16.3	16.3	16.2	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
39	22.0	21.9	17.9	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
40	13.9	13.9	13.8	12.1	10.5	8.0	6.5	5.3	4.3	3.4	2.7	2.2	1.7	1.2	...	...	...
41	18.7	18.6	15.2	12.1	10.5	8.0	6.5	5.3	4.3	3.4	2.7	2.2	1.7	1.2	...	...	...
42	13.9	13.9	13.8	12.1	10.5	8.0	6.5	5.3	4.3	3.4	2.7	2.2	1.7	1.2	...	...	...
43	18.7	18.6	15.2	12.1	10.5	8.0	6.5	5.3	4.3	3.4	2.7	2.2	1.7	1.2	...	...	...
44	16.3	16.3	16.2	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...
45	22.0	21.9	17.9	14.2	12.3	9.4	7.6	6.2	5.0	4.0	3.2	2.6	2.0	1.4	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	26Ni-43Fe-22Cr-5Mo	Wld. pipe	SB-619	...	N08320	Solution ann.
2	26Ni-43Fe-22Cr-5Mo	Wld. pipe	SB-619	...	N08320	Solution ann.
3	26Ni-43Fe-22Cr-5Mo	Plate, sheet, strip	SB-620	...	N08320	Solution ann.
4	26Ni-43Fe-22Cr-5Mo	Plate, sheet, strip	SB-620	...	N08320	Solution ann.
5	26Ni-43Fe-22Cr-5Mo	Rod	SB-621	...	N08320	Solution ann.
6	26Ni-43Fe-22Cr-5Mo	Rod	SB-621	...	N08320	Solution ann.
7	26Ni-43Fe-22Cr-5Mo	Smls. pipe & tube	SB-622	...	N08320	Solution ann.
8	26Ni-43Fe-22Cr-5Mo	Smls. pipe & tube	SB-622	...	N08320	Solution ann.
9	26Ni-43Fe-22Cr-5Mo	Wld. tube	SB-626	...	N08320	Solution ann.
10	26Ni-43Fe-22Cr-5Mo	Wld. tube	SB-626	...	N08320	Solution ann.
11	35Ni-19Cr-1 $\frac{1}{4}$ Si	Bar	SB-511	...	N08330	...
12	35Ni-19Cr-1 $\frac{1}{4}$ Si	Bar	SB-511	...	N08330	...
13	35Ni-19Cr-1 $\frac{1}{4}$ Si	Bar	SB-511	...	N08330	...
14	35Ni-19Cr-1 $\frac{1}{4}$ Si	Bar	SB-511	...	N08330	...
15	35Ni-19Cr-1 $\frac{1}{4}$ Si	Pipe	SB-535	...	N08330	...
16	35Ni-19Cr-1 $\frac{1}{4}$ Si	Pipe	SB-535	...	N08330	...
17	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate	SB-536	...	N08330	...
18	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate	SB-536	...	N08330	...
19	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. fittings	SB-366	...	N08330	Annealed
20	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. pipe	SB-535	...	N08330	Annealed
21	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. pipe	SB-535	...	N08330	Annealed
22	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate, sheet, strip	SB-536	...	N08330	Annealed
23	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate, sheet, strip	SB-536	...	N08330	Annealed
24	35Ni-19Cr-1 $\frac{1}{4}$ Si	Wld. pipe	SB-710	...	N08330	Annealed
25	35Ni-19Cr-1 $\frac{1}{4}$ Si	Wld. pipe	SB-710	...	N08330	Annealed
26	35Ni-23Cr-7.5Mo-N	Plate, sheet, strip	SB-625	...	N08354	Solution ann.
27	35Ni-23Cr-7.5Mo-N	Plate, sheet, strip	SB-625	...	N08354	Solution ann.
28	35Ni-23Cr-7.5Mo-N	Bar, wire	SB-649	...	N08354	Solution ann.
29	35Ni-23Cr-7.5Mo-N	Bar, wire	SB-649	...	N08354	Solution ann.
30	35Ni-23Cr-7.5Mo-N	Wld. pipe	SB-673	...	N08354	Solution ann.
31	35Ni-23Cr-7.5Mo-N	Wld. pipe	SB-673	...	N08354	Solution ann.
32	35Ni-23Cr-7.5Mo-N	Wld. tube	SB-674	...	N08354	Solution ann.
33	35Ni-23Cr-7.5Mo-N	Wld. tube	SB-674	...	N08354	Solution ann.
34	35Ni-23Cr-7.5Mo-N	Smls. pipe & tube	SB-677	...	N08354	Solution ann.
35	35Ni-23Cr-7.5Mo-N	Smls. pipe & tube	SB-677	...	N08354	Solution ann.
36	46Fe-24Ni-21Cr-6Mo-N	Smls. & wld. fittings	SB-366	...	N08367	Solution ann.
37	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-462	...	N08367	Solution ann.
38	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-462	...	N08367	Solution ann.
39	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-564	...	N08367	Solution ann.
40	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-564	...	N08367	Solution ann.
41	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.
42	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.
43	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.
44	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.
45	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	45	75	28	NP	NP	800	650	NFN-13	G14
2	...	45	75	28	NP	NP	800	650	NFN-13	G5, G14
3	...	45	75	28	NP	NP	800	650	NFN-13	...
4	...	45	75	28	NP	NP	800	650	NFN-13	G5
5	...	45	75	28	NP	NP	800	650	NFN-13	...
6	...	45	75	28	NP	NP	800	650	NFN-13	G5
7	...	45	75	28	NP	NP	800	650	NFN-13	...
8	...	45	75	28	NP	NP	800	650	NFN-13	G5
9	...	45	75	28	NP	NP	800	650	NFN-13	G14
10	...	45	75	28	NP	NP	800	650	NFN-13	G5, G14
11	...	46	70	30	1500	NP	NP	NP	NFN-13	G2, H2, T14
12	...	46	70	30	1500	NP	NP	NP	NFN-13	G2, G5, H2, T12
13	...	46	70	30	NP	NP	1650	650	NFN-13	G4, H1, T14
14	...	46	70	30	NP	NP	1650	650	NFN-13	G4, G5, H1, T12
15	...	46	70	30	1500	NP	NP	NP	NFN-13	G2, H2, T14
16	...	46	70	30	1500	NP	NP	NP	NFN-13	G2, G5, H2, T12
17	...	46	70	30	1500	NP	NP	NP	NFN-13	G2, H2, T14
18	...	46	70	30	1500	NP	NP	NP	NFN-13	G2, G5, H2, T12
19	...	46	70	30	NP	NP	1650	650	NFN-13	G4, G5, T12, W12
20	...	46	70	30	NP	NP	1500	650	NFN-13	H1, T14, W12
21	...	46	70	30	NP	NP	1500	650	NFN-13	G5, H1, T12, W12
22	...	46	70	30	NP	NP	1650	650	NFN-13	G4, H1, T14
23	...	46	70	30	NP	NP	1650	650	NFN-13	G4, G5, H1, T12
24	...	46	70	30	NP	NP	1650	650	NFN-13	G4, G14, H1, T14
25	...	46	70	30	NP	NP	1650	650	NFN-13	G4, G5, G14, H1, T12
26	...	45	93	43	NP	NP	800	NP	HA-6	...
27	...	45	93	43	NP	NP	800	NP	HA-6	G5
28	...	45	93	43	NP	NP	800	NP	HA-6	...
29	...	45	93	43	NP	NP	800	NP	HA-6	G5
30	...	45	93	43	NP	NP	800	NP	HA-6	G14
31	...	45	93	43	NP	NP	800	NP	HA-6	G5, G14
32	...	45	93	43	NP	NP	800	NP	HA-6	G14
33	...	45	93	43	NP	NP	800	NP	HA-6	G5, G14
34	...	45	93	43	NP	NP	800	NP	HA-6	...
35	...	45	93	43	NP	NP	800	NP	HA-6	G5
36	> ³ / ₁₆	45	95	45	NP	800	800	NP	NFN-12	G5, W5, W12
37	...	45	95	45	NP	800	800	650	NFN-12	...
38	...	45	95	45	NP	800	800	650	NFN-12	G5
39	...	45	95	45	NP	800	800	650	NFN-12	...
40	...	45	95	45	NP	800	800	650	NFN-12	G5
41	> ³ / ₁₆	45	95	45	NP	800	800	650	NFN-12	G14
42	> ³ / ₁₆	45	95	45	NP	800	800	650	NFN-12	G5, G14
43	> ³ / ₁₆	45	95	45	NP	800	800	650	NFN-12	G14
44	> ³ / ₁₆	45	95	45	NP	800	800	650	NFN-12	G5, G14
45	> ³ / ₁₆	45	95	45	NP	800	800	650	NFN-12	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	15.9	...	14.7	...	13.9	...	13.1	...	12.3	...	11.7	11.4	11.2	11.0	10.8	...	...	...
2	15.9	...	15.9	...	15.9	...	15.9	...	15.9	...	15.8	15.4	15.1	14.9	14.6	...	...	...
3	18.7	...	17.3	...	16.3	...	15.4	...	14.5	...	13.8	13.5	13.2	13.0	12.7	...	...	...
4	18.7	...	18.7	...	18.7	...	18.7	...	18.7	...	18.6	18.2	17.8	17.5	17.2	...	...	...
5	18.7	...	17.3	...	16.3	...	15.4	...	14.5	...	13.8	13.5	13.2	13.0	12.7	...	...	...
6	18.7	...	18.7	...	18.7	...	18.7	...	18.7	...	18.6	18.2	17.8	17.5	17.2	...	...	...
7	18.7	...	17.3	...	16.3	...	15.4	...	14.5	...	13.8	13.5	13.2	13.0	12.7	...	...	...
8	18.7	...	18.7	...	18.7	...	18.7	...	18.7	...	18.6	18.2	17.8	17.5	17.2	...	...	...
9	15.9	...	14.7	...	13.9	...	13.1	...	12.3	...	11.7	11.4	11.2	11.0	10.8	...	...	...
10	15.9	...	15.9	...	15.9	...	15.9	...	15.9	...	15.8	15.4	15.1	14.9	14.6	...	...	...
11	20.0	...	17.7	...	16.4	...	15.5	...	14.7	...	14.0	13.7	13.4	13.1	12.9	12.6	12.4	12.1
12	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
13	20.0	...	17.7	...	16.4	...	15.5	...	14.7	...	14.0	13.7	13.4	13.1	12.9	12.6	12.4	12.1
14	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
15	20.0	...	17.7	...	16.4	...	15.5	...	14.7	...	14.0	13.7	13.4	13.1	12.9	12.6	12.4	12.1
16	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
17	20.0	...	17.7	...	16.4	...	15.5	...	14.7	...	14.0	13.7	13.4	13.1	12.9	12.6	12.4	12.1
18	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
19	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
20	20.0	...	17.7	...	16.4	...	15.5	...	14.7	...	14.0	13.7	13.4	13.1	12.9	12.6	12.4	12.1
21	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
22	20.0	...	17.7	...	16.4	...	15.5	...	14.7	...	14.0	13.7	13.4	13.1	12.9	12.6	12.4	12.1
23	20.0	...	20.0	...	20.0	...	19.6	...	19.4	...	18.9	18.5	18.1	17.7	17.4	17.0	16.7	16.1
24	17.0	...	15.0	...	14.0	...	13.2	...	12.5	...	11.9	11.7	11.4	11.2	10.9	10.7	10.5	10.3
25	17.0	...	17.0	...	17.0	...	16.7	...	16.5	...	16.1	15.7	15.4	15.1	14.8	14.5	14.2	13.7
26	26.5	...	24.3	...	22.1	...	20.5	...	19.6	...	18.9	18.6	18.3	18.0	17.7	...	...	...
27	26.5	...	26.5	...	25.0	...	23.8	...	23.0	...	22.5	22.3	22.1	21.9	21.7	...	...	...
28	26.5	...	24.3	...	22.1	...	20.5	...	19.6	...	18.9	18.6	18.3	18.0	17.7	...	...	...
29	26.5	...	26.5	...	25.0	...	23.8	...	23.0	...	22.5	22.3	22.1	21.9	21.7	...	...	...
30	22.5	...	20.7	...	18.8	...	17.4	...	16.7	...	16.1	15.8	15.6	15.3	15.0	...	...	...
31	22.5	...	22.5	...	21.3	...	20.2	...	19.6	...	19.1	19.0	18.8	18.6	18.4	...	...	...
32	22.5	...	20.7	...	18.8	...	17.4	...	16.7	...	16.1	15.8	15.6	15.3	15.0	...	...	...
33	22.5	...	22.5	...	21.3	...	20.2	...	19.6	...	19.1	19.0	18.8	18.6	18.4	...	...	...
34	26.5	...	24.3	...	22.1	...	20.5	...	19.6	...	18.9	18.6	18.3	18.0	17.7	...	...	...
35	26.5	...	26.5	...	25.0	...	23.8	...	23.0	...	22.5	22.3	22.1	21.9	21.7	...	...	...
36	27.1	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
37	27.1	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
38	27.1	...	27.1	...	25.7	...	24.6	...	23.8	...	23.3	23.1	22.9	22.8	22.6	...	...	...
39	27.1	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
40	27.1	...	27.1	...	25.7	...	24.6	...	23.8	...	23.3	23.1	22.9	22.8	22.6	...	...	...
41	23.1	...	22.2	...	20.2	...	18.7	...	17.4	...	16.5	16.1	15.8	15.5	15.3	...	...	...
42	23.1	...	23.1	...	21.8	...	20.9	...	20.2	...	19.8	19.6	19.5	19.4	19.2	...	...	...
43	23.1	...	22.2	...	20.2	...	18.7	...	17.4	...	16.5	16.1	15.8	15.5	15.3	...	...	...
44	23.1	...	23.1	...	21.8	...	20.9	...	20.2	...	19.8	19.6	19.5	19.4	19.2	...	...	...
45	27.1	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	11.9	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
12	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
13	11.9	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48	...	...	...
14	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48	...	...	...
15	11.9	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
16	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
17	11.9	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
18	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
19	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48	...	...	...
20	11.9	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
21	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	...	...	...	...	...	...
22	11.9	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48	...	...	...
23	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48	...	...	...
24	10.1	8.5	6.6	5.1	4.0	3.2	2.6	2.0	1.5	1.3	0.94	0.77	0.58	0.41	...	...	...
25	10.8	8.5	6.6	5.1	4.0	3.2	2.6	2.0	1.5	1.3	0.94	0.77	0.58	0.41	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.
2	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.
3	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.
4	46Fe-24Ni-21Cr-6Mo-N	Bar, rod, wire	SB-691	...	N08367	Solution ann.
5	46Fe-24Ni-21Cr-6Mo-N	Bar, rod, wire	SB-691	...	N08367	Solution ann.
6	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.
7	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.
(23) 8	46Fe-24Ni-21Cr-6Mo-N	Smls. & wld. fittings	SB-366	...	N08367	Solution ann.
9	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.
10	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.
11	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.
12	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.
13	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.
14	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.
15	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.
16	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.
17	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.
18	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.
19	46Fe-24Ni-21Cr-6Mo-N	Castings	SA-351	CN3MN	J94651	Solution ann.
20	25Ni-47Fe-21Cr-5Mo	Plate, sheet, strip	SB-599	...	N08700	Solution ann.
21	25Ni-47Fe-21Cr-5Mo	Plate, sheet, strip	SB-599	...	N08700	Solution ann.
22	25Ni-47Fe-21Cr-5Mo	Bar, wire	SB-672	...	N08700	Solution ann.
23	32Ni-45Fe-20Cr-Cb	Castings	SA-351	CT15C	...	As cast
24	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Annealed
25	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Annealed
(23) 26	33Ni-42Fe-21Cr	Smls. & wld. fittings	SB-366	...	N08800	Annealed
27	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08800	Annealed
28	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08800	Annealed
29	33Ni-42Fe-21Cr	Bar	SB-408	...	N08800	Annealed
30	33Ni-42Fe-21Cr	Bar	SB-408	...	N08800	Annealed
31	33Ni-42Fe-21Cr	Plate	SB-409	...	N08800	Annealed
32	33Ni-42Fe-21Cr	Plate	SB-409	...	N08800	Annealed
33	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08800	Annealed
34	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08800	Annealed
35	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08800	Annealed
36	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08800	Annealed
37	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08800	Annealed
38	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08800	Annealed
39	32Ni-44Fe-21Cr	Smls. tube	SB-163	...	N08801	Ann./stabilized
40	32Ni-44Fe-21Cr	Smls. tube	SB-163	...	N08801	Ann./stabilized
41	32Ni-44Fe-21Cr	Smls. pipe & tube	SB-407	...	N08801	Ann./stabilized
42	32Ni-44Fe-21Cr	Smls. pipe & tube	SB-407	...	N08801	Ann./stabilized
43	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08810	Annealed
44	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08810	Annealed
45	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08810	Annealed

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	$> \frac{3}{16}$	45	95	45	NP	800	800	650	NFN-12	G5
2	$> \frac{3}{16}$	45	95	45	NP	800	800	650	NFN-12	...
3	$> \frac{3}{16}$	45	95	45	NP	800	800	650	NFN-12	G5
4	...	45	95	45	NP	800	800	650	NFN-12	...
5	...	45	95	45	NP	800	800	650	NFN-12	G5
6	$> \frac{3}{16}$	45	95	45	NP	800	800	650	NFN-12	G14
7	$> \frac{3}{16}$	45	95	45	NP	800	800	650	NFN-12	G5, G14
8	$\leq \frac{3}{16}$	45	100	45	NP	800	800	NP	NFN-12	G5, W5, W12
9	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G14
10	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G5, G14
11	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G14
12	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G5, G14
13	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	...
14	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G5
15	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	...
16	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G5
17	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G14
18	$\leq \frac{3}{16}$	45	100	45	NP	800	800	650	NFN-12	G5, G14
19	...	45	80	38	NP	800	800	650	NFN-12	G15
20	...	45	80	35	NP	NP	650	650	NFN-8	...
21	...	45	80	35	NP	NP	650	650	NFN-8	G5
22	...	45	80	35	NP	NP	650	650	NFN-8	...
23	...	45	63	25	NP	NP	1600	650	NFN-9	G4, G15
24	...	45	75	30	NP	800	1500	NP	NFN-8	G5, T14
25	...	45	75	30	NP	NP	1500	NP	NFN-8	T15
26	...	45	75	30	NP	800	1500	NP	NFN-8	G5, T14, W5, W12
27	...	45	75	30	1500	800	1500	NP	NFN-8	G5, T14
28	...	45	75	30	1500	NP	1500	NP	NFN-8	T15
29	...	45	75	30	1500	800	1500	NP	NFN-8	G5, T14
30	...	45	75	30	1500	NP	1500	NP	NFN-8	T15
31	...	45	75	30	1500	800	1500	NP	NFN-8	G5, T14
32	...	45	75	30	1500	NP	1500	NP	NFN-8	T15
33	...	45	75	30	NP	NP	1500	NP	NFN-8	G14, T15
34	...	45	75	30	NP	NP	1500	NP	NFN-8	G5, G14, T14
35	...	45	75	30	1500	NP	1500	NP	NFN-8	G5, G14, T14
36	...	45	75	30	1500	NP	1500	NP	NFN-8	G14, T15
37	...	45	75	30	1500	800	1500	NP	NFN-8	G5, T14
38	...	45	75	30	1500	NP	1500	NP	NFN-8	T15
39	...	45	65	25	1050	NP	900	NP	NFN-9	H4
40	...	45	65	25	1050	NP	900	NP	NFN-9	G5, H4
41	...	45	65	25	1050	NP	900	NP	NFN-9	H4
42	...	45	65	25	1050	NP	900	NP	NFN-9	G5, H4
43	...	45	65	25	NP	NP	1650	NP	NFN-9	G4, T16
44	...	45	65	25	NP	800	1650	NP	NFN-9	G4, G5, T15
45	...	45	65	25	1500	NP	1800	NP	NFN-9	G4, T16

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	27.1	...	27.1	...	25.7	...	24.6	...	23.8	...	23.3	23.1	22.9	22.8	22.6	...	...	...
2	27.1	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
3	27.1	...	27.1	...	25.7	...	24.6	...	23.8	...	23.3	23.1	22.9	22.8	22.6	...	...	...
4	27.1	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
5	27.1	...	27.1	...	25.7	...	24.6	...	23.8	...	23.3	23.1	22.9	22.8	22.6	...	...	...
6	23.1	...	22.2	...	20.2	...	18.7	...	17.4	...	16.5	16.1	15.8	15.5	15.3	...	...	...
7	23.1	...	23.1	...	21.8	...	20.9	...	20.2	...	19.8	19.6	19.5	19.4	19.2	...	...	...
8	28.6	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
9	24.3	...	22.2	...	20.2	...	18.7	...	17.4	...	16.5	16.1	15.8	15.5	15.3	...	...	...
10	24.3	...	24.3	...	23.0	...	22.0	...	21.3	...	20.8	20.7	20.5	20.4	20.2	...	...	...
11	24.3	...	22.2	...	20.2	...	18.7	...	17.4	...	16.5	16.1	15.8	15.5	15.3	...	...	...
12	24.3	...	24.3	...	23.0	...	22.0	...	21.3	...	20.8	20.7	20.5	20.4	20.2	...	...	...
13	28.6	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
14	28.6	...	28.6	...	27.0	...	25.8	...	25.0	...	24.5	24.3	24.1	24.0	23.8	...	...	...
15	28.6	...	26.2	...	23.8	...	21.9	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...	...
16	28.6	...	28.6	...	27.0	...	25.8	...	25.0	...	24.5	24.3	24.1	24.0	23.8	...	...	...
17	24.3	...	22.2	...	20.2	...	18.7	...	17.4	...	16.5	16.1	15.8	15.5	15.3	...	...	...
18	24.3	...	24.3	...	23.0	...	22.0	...	21.3	...	20.8	20.7	20.5	20.4	20.2	...	...	...
19	22.9	...	21.4	...	18.8	...	16.9	...	15.7	...	14.9	14.7	14.5	14.4	14.2	...	...	...
20	22.9	...	21.0	...	19.0	...	17.7	...	17.1	...	16.5	15.8	...	...	...	...	...	...
21	22.9	...	22.9	...	22.6	...	22.0	...	21.5	...	21.4	21.4	...	...	...	...	...	...
22	22.9	...	21.0	...	19.0	...	17.7	...	17.1	...	16.5	15.8	...	...	...	...	...	...
23	16.7	...	15.7	...	15.3	...	14.9	...	14.6	...	14.2	13.9	13.7	13.5	13.3	13.1	12.9	12.7
24	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
25	20.0	...	18.5	...	17.8	...	17.2	...	16.8	...	16.3	16.1	15.9	15.7	15.5	15.3	15.1	14.9
26	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
27	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
28	20.0	...	18.5	...	17.8	...	17.2	...	16.8	...	16.3	16.1	15.9	15.7	15.5	15.3	15.1	14.9
29	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
30	20.0	...	18.5	...	17.8	...	17.2	...	16.8	...	16.3	16.1	15.9	15.7	15.5	15.3	15.1	14.9
31	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
32	20.0	...	18.5	...	17.8	...	17.2	...	16.8	...	16.3	16.1	15.9	15.7	15.5	15.3	15.1	14.9
33	17.0	...	15.7	...	15.1	...	14.6	...	14.2	...	13.9	13.7	13.5	13.3	13.2	13.0	12.8	12.7
34	17.0	...	17.0	...	17.0	...	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
35	17.0	...	17.0	...	17.0	...	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
36	17.0	...	15.7	...	15.1	...	14.6	...	14.2	...	13.9	13.7	13.5	13.3	13.2	13.0	12.8	12.7
37	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
38	20.0	...	18.5	...	17.8	...	17.2	...	16.8	...	16.3	16.1	15.9	15.7	15.5	15.3	15.1	14.9
39	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
40	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
41	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
42	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
43	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
44	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
45	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	11.5	10.1	8.9	7.8	6.7	5.7	4.8	4.0	3.3	2.7	2.2	1.8	1.4	...	...	...	...
24	19.9	17.0	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
25	14.7	14.5	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
26	19.9	17.0	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
27	19.9	17.0	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
28	14.7	14.5	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
29	19.9	17.0	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
30	14.7	14.5	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
31	19.9	17.0	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
32	14.7	14.5	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
33	12.5	12.3	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...	...	...	...
34	16.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...	...	...	...
35	16.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...	...	...	...
36	12.5	12.3	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...	...	...	...
37	19.9	17.0	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
38	14.7	14.5	13.0	9.8	6.6	4.2	2.0	1.6	1.1	1.0	0.80	...	...	...	...	...	...
39	10.4	10.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	14.0	13.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	10.4	10.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	14.0	13.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	10.4	10.2	10.0	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
44	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
45	10.4	10.2	10.0	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	0.71	0.56	0.44

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08810	Hot fin./ann.
2	33Ni-42Fe-21Cr	Bar	SB-408	...	N08810	Annealed
3	33Ni-42Fe-21Cr	Bar	SB-408	...	N08810	Annealed
4	33Ni-42Fe-21Cr	Plate	SB-409	...	N08810	Annealed
5	33Ni-42Fe-21Cr	Plate	SB-409	...	N08810	Annealed
6	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08810	Annealed
7	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08810	Annealed
8	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08810	Annealed
9	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08810	Annealed
10	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08810	Annealed
11	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08810	Annealed
12	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08811	Annealed
13	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08811	Annealed
14	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08811	Annealed
15	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08811	Annealed
16	33Ni-42Fe-21Cr	Bar	SB-408	...	N08811	Annealed
17	33Ni-42Fe-21Cr	Bar	SB-408	...	N08811	Annealed
18	33Ni-42Fe-21Cr	Plate	SB-409	...	N08811	Annealed
19	33Ni-42Fe-21Cr	Plate	SB-409	...	N08811	Annealed
20	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08811	Annealed
21	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08811	Annealed
22	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08811	Annealed
23	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08811	Annealed
24	42Ni-21.5Cr-3Mo-2.3Cu	Smls. tube	SB-163	...	N08825	Annealed
25	42Ni-21.5Cr-3Mo-2.3Cu	Smls. tube	SB-163	...	N08825	Annealed
(23) 26	42Ni-21.5Cr-3Mo-2.3Cu	Smls. & wld. fittings	SB-366	...	N08825	Annealed
27	42Ni-21.5Cr-3Mo-2.3Cu	Smls. pipe & tube	SB-423	...	N08825	Cold worked/ann.
28	42Ni-21.5Cr-3Mo-2.3Cu	Smls. pipe & tube	SB-423	...	N08825	Cold worked/ann.
29	42Ni-21.5Cr-3Mo-2.3Cu	Plate	SB-424	...	N08825	Annealed
30	42Ni-21.5Cr-3Mo-2.3Cu	Plate	SB-424	...	N08825	Annealed
31	42Ni-21.5Cr-3Mo-2.3Cu	Bar, rod	SB-425	...	N08825	Annealed
32	42Ni-21.5Cr-3Mo-2.3Cu	Bar, rod	SB-425	...	N08825	Annealed
33	42Ni-21.5Cr-3Mo-2.3Cu	Forgings	SB-564	...	N08825	Annealed
34	42Ni-21.5Cr-3Mo-2.3Cu	Forgings	SB-564	...	N08825	Annealed
35	42Ni-21.5Cr-3Mo-2.3Cu	Wld. tube	SB-704	...	N08825	Annealed
36	42Ni-21.5Cr-3Mo-2.3Cu	Wld. tube	SB-704	...	N08825	Annealed
37	42Ni-21.5Cr-3Mo-2.3Cu	Wld. pipe	SB-705	...	N08825	Annealed
38	42Ni-21.5Cr-3Mo-2.3Cu	Wld. pipe	SB-705	...	N08825	Annealed
39	44Fe-25Ni-21Cr-Mo	Forgings	SA-182	...	N08904	Annealed
(23) 40	44Fe-25Ni-21Cr-Mo	Smls. tube	SA-213	...	N08904	Annealed
41	44Fe-25Ni-21Cr-Mo	Plate, sheet, strip	SA-240	...	N08904	Annealed
42	44Fe-25Ni-21Cr-Mo	Wld. tube	SA-249	...	N08904	Annealed
43	44Fe-25Ni-21Cr-Mo	Smls. pipe	SA-312	...	N08904	Annealed
44	44Fe-25Ni-21Cr-Mo	Wld. pipe	SA-312	...	N08904	Annealed
45	44Fe-25Ni-21Cr-Mo	Fittings	SA-403	...	N08904	Annealed

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	45	65	25	1500	800	1800	NP	NFN-9	G4, G5, T15
2	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T16
3	...	45	65	25	1500	800	1650	NP	NFN-9	G4, G5, T15
4	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T16
5	...	45	65	25	1500	800	1650	NP	NFN-9	G4, G5, T15
6	...	45	65	25	NP	NP	1650	NP	NFN-9	G4, G14, T16
7	...	45	65	25	NP	NP	1650	NP	NFN-9	G4, G5, G14, T15
8	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G14, T16
9	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, G14, T15
10	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T16
11	...	45	65	25	1500	800	1650	NP	NFN-9	G4, G5, T15
12	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T17
13	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, T15
14	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T17
15	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, T15
16	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T17
17	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, T15
18	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T17
19	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, T15
20	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G14, T17
21	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, G14, T16
22	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, T17
23	...	45	65	25	1500	NP	1650	NP	NFN-9	G4, G5, T15
24	...	45	85	35	NP	800 (Cl. 3 only)	1000	650	NFN-7	...
25	...	45	85	35	NP	800 (Cl. 3 only)	1000	650	NFN-7	G5
26	...	45	85	35	NP	800 (Cl. 3 only)	1000	650	NFN-7	G5, W5, W12
27	...	45	85	35	1000	800 (Cl. 3 only)	1000	650	NFN-7	...
28	...	45	85	35	1000	800 (Cl. 3 only)	1000	650	NFN-7	G5
29	...	45	85	35	1000	800 (Cl. 3 only)	1000	650	NFN-7	...
30	...	45	85	35	1000	800 (Cl. 3 only)	1000	650	NFN-7	G5
31	...	45	85	35	1000	800 (Cl. 3 only)	1000	650	NFN-7	...
32	...	45	85	35	1000	800 (Cl. 3 only)	1000	650	NFN-7	G5
33	...	45	85	35	NP	NP	1000	NP	NFN-7	...
34	...	45	85	35	NP	NP	1000	NP	NFN-7	G5
35	...	45	85	35	NP	800	1000	650	NFN-7	G14
36	...	45	85	35	NP	NP	1000	650	NFN-7	G5, G14
37	...	45	85	35	NP	NP	1000	650	NFN-7	G14
38	...	45	85	35	NP	NP	1000	650	NFN-7	G5, G14
39	...	45	71	31	NP	700	700	650	NFN-9	W12
40	...	45	71	31	NP	700	700	650	NFN-9	...
41	...	45	71	31	NP	700	700	650	NFN-9	...
42	...	45	71	31	NP	700	700	650	NFN-9	G14
43	...	45	71	31	NP	700	700	650	NFN-9	...
44	...	45	71	31	NP	700	700	650	NFN-9	G14
45	...	45	71	31	NP	700	700	650	NFN-9	W12

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
2	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
3	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
4	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
5	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
6	14.2	...	13.1	...	12.3	...	11.6	...	10.9	...	10.4	10.1	9.9	9.7	9.5	9.3	9.1	9.0
7	14.2	...	14.2	...	14.2	...	14.2	...	14.2	...	14.0	13.7	13.3	13.0	12.8	12.5	12.3	12.1
8	14.2	...	13.1	...	12.3	...	11.6	...	10.9	...	10.4	10.1	9.9	9.7	9.5	9.3	9.1	9.0
9	14.2	...	14.2	...	14.2	...	14.2	...	14.2	...	14.0	13.7	13.3	13.0	12.8	12.5	12.3	12.1
10	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
11	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
12	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
13	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
14	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
15	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
16	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
17	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
18	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
19	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
20	14.2	...	13.1	...	12.3	...	11.6	...	10.9	...	10.4	10.1	9.9	9.7	9.5	9.3	9.1	9.0
21	14.2	...	14.2	...	14.2	...	14.2	...	14.2	...	14.0	13.7	13.3	13.0	12.8	12.5	12.3	12.1
22	16.7	...	15.4	...	14.4	...	13.6	...	12.9	...	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5
23	16.7	...	16.7	...	16.7	...	16.7	...	16.7	...	16.5	16.1	15.7	15.3	15.0	14.7	14.5	14.2
24	23.3	...	21.4	...	20.3	...	19.4	...	18.5	...	17.8	17.5	17.3	17.2	17.0	17.0	16.9	16.8
25	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.2	23.0	22.9	22.8	22.6
26	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.2	23.0	22.9	22.8	22.6
27	23.3	...	21.4	...	20.3	...	19.4	...	18.5	...	17.8	17.5	17.3	17.2	17.0	17.0	16.9	16.8
28	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.2	23.0	22.9	22.8	22.6
29	23.3	...	21.4	...	20.3	...	19.4	...	18.5	...	17.8	17.5	17.3	17.2	17.0	17.0	16.9	16.8
30	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.2	23.0	22.9	22.8	22.6
31	23.3	...	21.4	...	20.3	...	19.4	...	18.5	...	17.8	17.5	17.3	17.2	17.0	17.0	16.9	16.8
32	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.2	23.0	22.9	22.8	22.6
33	23.3	...	21.4	...	20.3	...	19.4	...	18.5	...	17.8	17.5	17.3	17.2	17.0	17.0	16.9	16.8
34	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.2	23.0	22.9	22.8	22.6
35	19.8	...	18.2	...	17.3	...	16.5	...	15.8	...	15.2	14.9	14.7	14.6	14.5	14.4	14.3	14.2
36	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.8	19.8	19.8	19.7	19.6	19.5	19.4	19.2
37	19.8	...	18.2	...	17.3	...	16.5	...	15.8	...	15.2	14.9	14.7	14.6	14.5	14.4	14.3	14.2
38	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.8	19.8	19.8	19.7	19.6	19.5	19.4	19.2
39	20.3	...	16.7	...	15.1	...	13.8	...	12.7	...	11.9	11.6	11.4	...	...	...	...	...
40	20.3	...	16.7	...	15.1	...	13.8	...	12.7	...	11.9	11.6	11.4	...	...	...	...	...
41	20.3	...	16.7	...	15.1	...	13.8	...	12.7	...	11.9	11.6	11.4	...	...	...	...	...
42	17.2	...	14.2	...	12.9	...	11.8	...	10.8	...	10.1	9.9	9.7	...	...	...	...	...
43	20.3	...	16.7	...	15.1	...	13.8	...	12.7	...	11.9	11.6	11.4	...	...	...	...	...
44	17.2	...	14.2	...	12.9	...	11.8	...	10.8	...	10.1	9.9	9.7	...	...	...	...	...
45	20.3	...	16.7	...	15.1	...	13.8	...	12.7	...	11.9	11.6	11.4	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	0.71	0.56	0.44
2	10.4	10.2	10.0	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
3	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
4	10.4	10.2	10.0	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
5	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
6	8.8	8.7	8.5	7.9	6.3	5.0	4.0	3.2	2.6	2.0	1.6	1.2	0.94	0.73	...	...	...
7	11.9	11.7	9.9	7.9	6.3	5.0	4.0	3.2	2.6	2.0	1.6	1.2	0.94	0.73	...	...	...
8	8.8	8.7	8.5	7.9	6.3	5.0	4.0	3.2	2.6	2.0	1.6	1.2	0.94	0.73	...	...	...
9	11.9	11.7	9.9	7.9	6.3	5.0	4.0	3.2	2.6	2.0	1.6	1.2	0.94	0.73	...	...	...
10	10.4	10.2	10.0	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
11	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.4	1.1	0.86	...	...	...
12	10.4	10.2	10.0	9.8	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
13	14.0	13.8	12.9	10.4	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
14	10.4	10.2	10.0	9.8	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
15	14.0	13.8	12.9	10.4	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
16	10.4	10.2	10.0	9.8	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
17	14.0	13.8	12.9	10.4	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
18	10.4	10.2	10.0	9.8	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
19	14.0	13.8	12.9	10.4	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
20	8.8	8.7	8.5	8.3	7.1	5.7	4.6	3.7	2.9	2.3	1.9	1.3	1.0	0.77	...	...	...
21	11.9	11.7	11.5	8.8	7.1	5.7	4.6	3.7	2.9	2.3	1.9	1.3	1.0	0.77	...	...	...
22	10.4	10.2	10.0	9.8	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
23	14.0	13.8	12.9	10.4	8.3	6.7	5.4	4.3	3.4	2.7	2.2	1.6	1.2	0.91	...	...	...
24	16.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	16.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	16.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	16.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	16.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	14.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	18.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	14.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	18.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
(23) 1	44Fe-25Ni-21Cr-Mo	Bar	SA-479	...	N08904	Annealed
2	25Ni-20Cr-6Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08925	Annealed
3	25Ni-20Cr-6Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08925	Annealed
4	25Ni-20Cr-6Mo-Cu-N	Bar, wire	SB-649	...	N08925	Annealed
5	25Ni-20Cr-6Mo-Cu-N	Bar, wire	SB-649	...	N08925	Annealed
6	25Ni-20Cr-6Mo-Cu-N	Wld. pipe	SB-673	...	N08925	Annealed
7	25Ni-20Cr-6Mo-Cu-N	Wld. pipe	SB-673	...	N08925	Annealed
8	25Ni-20Cr-6Mo-Cu-N	Wld. tube	SB-674	...	N08925	Annealed
9	25Ni-20Cr-6Mo-Cu-N	Wld. tube	SB-674	...	N08925	Annealed
10	25Ni-20Cr-6Mo-Cu-N	Smls. pipe & tube	SB-677	...	N08925	Annealed
11	25Ni-20Cr-6Mo-Cu-N	Smls. pipe & tube	SB-677	...	N08925	Annealed
12	62Ni-28Mo-5Fe	Plate	SB-333	...	N10001	Annealed
13	62Ni-28Mo-5Fe	Plate	SB-333	...	N10001	Annealed
14	62Ni-28Mo-5Fe	Smls. & wld. fittings	SB-366	...	N10001	Annealed
15	62Ni-28Mo-5Fe	Wld. pipe	SB-619	...	N10001	Solution ann.
16	62Ni-28Mo-5Fe	Wld. pipe	SB-619	...	N10001	Solution ann.
17	62Ni-28Mo-5Fe	Smls. pipe & tube	SB-622	...	N10001	Solution ann.
18	62Ni-28Mo-5Fe	Smls. pipe & tube	SB-622	...	N10001	Solution ann.
19	62Ni-28Mo-5Fe	Wld. tube	SB-626	...	N10001	Solution ann.
20	62Ni-28Mo-5Fe	Wld. tube	SB-626	...	N10001	Solution ann.
21	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed
22	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed
23	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed
24	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed
25	62Ni-28Mo-5Fe	Sheet, strip	SB-333	...	N10001	Annealed
26	62Ni-28Mo-5Fe	Sheet, strip	SB-333	...	N10001	Annealed
27	70Ni-16Mo-7Cr-5Fe	Smls. & wld. fittings	SB-366	...	N10003	Annealed
28	70Ni-16Mo-7Cr-5Fe	Plate, sheet, strip	SB-434	...	N10003	Annealed
29	70Ni-16Mo-7Cr-5Fe	Rod	SB-573	...	N10003	Annealed
30	62Ni-25Mo-8Cr-2Fe	Smls. & wld. fittings	SB-366	...	N10242	Annealed
31	62Ni-25Mo-8Cr-2Fe	Plate, sheet, strip	SB-434	...	N10242	Annealed
32	62Ni-25Mo-8Cr-2Fe	Plate, sheet, strip	SB-434	...	N10242	Annealed
33	62Ni-25Mo-8Cr-2Fe	Forgings	SB-564	...	N10242	Annealed
34	62Ni-25Mo-8Cr-2Fe	Forgings	SB-564	...	N10242	Annealed
35	62Ni-25Mo-8Cr-2Fe	Rod	SB-573	...	N10242	Annealed
36	62Ni-25Mo-8Cr-2Fe	Rod	SB-573	...	N10242	Annealed
37	62Ni-25Mo-8Cr-2Fe	Wld. pipe	SB-619	...	N10242	Solution ann.
38	62Ni-25Mo-8Cr-2Fe	Wld. pipe	SB-619	...	N10242	Solution ann.
39	62Ni-25Mo-8Cr-2Fe	Smls. pipe & tube	SB-622	...	N10242	Solution ann.
40	62Ni-25Mo-8Cr-2Fe	Smls. pipe & tube	SB-622	...	N10242	Solution ann.
41	62Ni-25Mo-8Cr-2Fe	Wld. tube	SB-626	...	N10242	Solution ann.
42	62Ni-25Mo-8Cr-2Fe	Wld. tube	SB-626	...	N10242	Solution ann.
(23) 43	54Ni-16Mo-15Cr	Smls. & wld. fittings	SB-366	...	N10276	Solution ann.
44	54Ni-16Mo-15Cr	Forgings	SB-462	...	N10276	Solution ann.
45	54Ni-16Mo-15Cr	Forgings	SB-462	...	N10276	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	45	71	31	NP	700	700	650	NFN-9	...
2	...	45	87	43	NP	NP	800	650	NFN-12	...
3	...	45	87	43	NP	NP	800	650	NFN-12	G5
4	...	45	87	43	NP	NP	800	650	NFN-12	...
5	...	45	87	43	NP	NP	800	650	NFN-12	G5
6	...	45	87	43	NP	NP	800	650	NFN-12	G14
7	...	45	87	43	NP	NP	800	650	NFN-12	G5, G14
8	...	45	87	43	NP	NP	800	650	NFN-12	G14
9	...	45	87	43	NP	NP	800	650	NFN-12	G5, G14
10	...	45	87	43	NP	NP	800	650	NFN-12	...
11	...	45	87	43	NP	NP	800	650	NFN-12	G5
12	...	44	100	45	NP	800 (Cl. 3 only)	800	650	NFN-5	...
13	...	44	100	45	NP	800 (Cl. 3 only)	800	650	NFN-5	G5
14	...	44	100	45	NP	NP	800	650	NFN-5	G5, W12
15	...	44	100	45	NP	NP	800	650	NFN-5	G14
16	...	44	100	45	NP	NP	800	650	NFN-5	G5, G14
17	...	44	100	45	NP	NP	800	650	NFN-5	...
18	...	44	100	45	NP	NP	800	650	NFN-5	G5
19	...	44	100	45	NP	NP	800	650	NFN-5	G14
20	...	44	100	45	NP	NP	800	650	NFN-5	G5, G14
21	...	44	100	46	NP	800 (Cl. 3 only)	800	650	NFN-5	G13
22	...	44	100	46	NP	800 (Cl. 3 only)	800	650	NFN-5	G5, G13
23	...	44	115	46	NP	800 (Cl. 3 only)	800	650	NFN-5	G13
24	...	44	115	46	NP	800 (Cl. 3 only)	800	650	NFN-5	G5, G13
25	...	44	115	50	NP	800 (Cl. 3 only)	800	650	NFN-5	...
26	...	44	115	50	NP	800 (Cl. 3 only)	800	NP	NFN-5	G5
27	...	44	100	40	NP	NP	1300	650	NFN-6	T15, W12
28	...	44	100	40	NP	NP	1300	650	NFN-6	T15
29	...	44	100	40	NP	NP	1300	650	NFN-6	T15
30	...	44	105	45	NP	NP	1000	NP	NFN-6	G5, W12
31	...	44	105	45	NP	NP	1000	NP	NFN-6	G5
32	...	44	105	45	NP	NP	1000	NP	NFN-6	...
33	...	44	105	45	NP	NP	1000	NP	NFN-6	G5
34	...	44	105	45	NP	NP	1000	NP	NFN-6	...
35	...	44	105	45	NP	NP	1000	NP	NFN-6	G5
36	...	44	105	45	NP	NP	1000	NP	NFN-6	...
37	...	44	105	45	NP	NP	1000	NP	NFN-6	G5, G14
38	...	44	105	45	NP	NP	1000	NP	NFN-6	G14
39	...	44	105	45	NP	NP	1000	NP	NFN-6	G5
40	...	44	105	45	NP	NP	1000	NP	NFN-6	...
41	...	44	105	45	NP	NP	1000	NP	NFN-6	G5, G14
42	...	44	105	45	NP	NP	1000	NP	NFN-6	G14
43	...	43	100	41	1000	800	1250	650	NFN-10	G5, T14, W5, W12
44	...	43	100	41	NP	NP	1250	NP	NFN-10	T15
45	...	43	100	41	NP	NP	1250	NP	NFN-10	G5, T14

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	20.3	...	16.7	...	15.1	...	13.8	...	12.7	...	11.9	11.6	11.4	...	...	...	...	...
2	24.9	...	23.2	...	21.3	...	19.8	...	18.3	...	17.3	17.0	16.9	16.9	16.9	...	...	...
3	24.9	...	24.9	...	23.9	...	23.0	...	22.1	...	21.4	21.1	20.8	20.4	20.1	...	...	...
4	24.9	...	23.2	...	21.3	...	19.8	...	18.3	...	17.3	17.0	16.9	16.9	16.9	...	...	...
5	24.9	...	24.9	...	23.9	...	23.0	...	22.1	...	21.4	21.1	20.8	20.4	20.1	...	...	...
6	21.1	...	19.7	...	18.1	...	16.8	...	15.6	...	14.7	14.4	14.4	14.4	14.4	...	...	...
7	21.1	...	21.1	...	20.4	...	19.5	...	18.8	...	18.2	17.9	17.7	17.4	17.0	...	...	...
8	21.1	...	19.7	...	18.1	...	16.8	...	15.6	...	14.7	14.4	14.4	14.4	14.4	...	...	...
9	21.1	...	21.1	...	20.4	...	19.5	...	18.8	...	18.2	17.9	17.7	17.4	17.0	...	...	...
10	24.9	...	23.2	...	21.3	...	19.8	...	18.3	...	17.3	17.0	16.9	16.9	16.9	...	...	...
11	24.9	...	24.9	...	23.9	...	23.0	...	22.1	...	21.4	21.1	20.8	20.4	20.1	...	...	...
12	28.6	...	27.2	...	25.7	...	24.6	...	23.7	...	23.0	22.8	22.5	22.3	22.1	...	...	...
13	28.6	...	28.6	...	28.6	...	28.1	...	27.8	...	27.7	27.5	27.4	27.3	27.2	...	...	...
14	28.6	...	28.6	...	28.6	...	28.1	...	27.8	...	27.7	...	27.4	...	27.2	...	...	...
15	24.3	...	23.1	...	21.8	...	20.9	...	20.2	...	19.6	19.3	19.1	18.9	18.8	...	...	...
16	24.3	...	24.3	...	24.3	...	23.9	...	23.7	...	23.5	23.4	23.3	23.2	23.1	...	...	...
17	28.6	...	27.2	...	25.7	...	24.6	...	23.7	...	23.0	22.8	22.5	22.3	22.1	...	...	...
18	28.6	...	28.6	...	28.6	...	28.1	...	27.8	...	27.7	27.5	27.4	27.3	27.2	...	...	...
19	24.3	...	23.1	...	21.8	...	20.9	...	20.2	...	19.6	19.3	19.1	18.9	18.8	...	...	...
20	24.3	...	24.3	...	24.3	...	23.9	...	23.7	...	23.5	23.4	23.3	23.2	23.1	...	...	...
21	28.6	...	27.8	...	26.3	...	25.1	...	24.3	...	23.6	23.3	23.0	22.8	22.6	...	...	...
22	28.6	...	28.6	...	28.6	...	28.1	...	27.8	...	27.7	27.5	27.4	27.3	27.2	...	...	...
23	30.7	...	27.8	...	26.3	...	25.1	...	24.3	...	23.6	23.3	23.0	22.8	22.6	...	...	...
24	30.7	...	30.7	...	30.7	...	30.7	...	30.7	...	30.7	30.7	30.7	30.7	30.5	...	...	...
25	32.9	...	30.2	...	28.6	...	27.3	...	26.4	...	25.6	25.3	25.0	24.8	24.6	...	...	...
26	32.9	...	32.9	...	32.9	...	32.3	...	32.0	...	31.8	31.7	31.5	31.4	31.3	...	...	...
27	26.7	...	24.6	...	22.7	...	21.1	...	20.0	...	19.3	...	18.9	...	18.4	...	17.5	...
28	26.7	...	24.6	...	22.7	...	21.1	...	20.0	...	19.3	19.1	18.9	18.7	18.4	18.1	17.5	16.8
29	26.7	...	24.6	...	22.7	...	21.1	...	20.0	...	19.3	19.1	18.9	18.7	18.4	18.1	17.5	16.8
30	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.8	29.8	29.7	29.6	29.6	29.5	29.5	29.2
31	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.8	29.8	29.7	29.6	29.6	29.5	29.5	29.2
32	30.0	...	28.2	...	26.1	...	24.7	...	23.9	...	23.7	23.6	23.4	23.2	22.9	22.4	22.0	21.6
33	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.8	29.8	29.7	29.6	29.6	29.5	29.5	29.2
34	30.0	...	28.2	...	26.1	...	24.7	...	23.9	...	23.7	23.6	23.4	23.2	22.9	22.4	22.0	21.6
35	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.8	29.8	29.7	29.6	29.6	29.5	29.5	29.2
36	30.0	...	28.2	...	26.1	...	24.7	...	23.9	...	23.7	23.6	23.4	23.2	22.9	22.4	22.0	21.6
37	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	25.4	25.3	25.2	25.2	25.1	25.1	25.1	24.8
38	25.5	...	24.0	...	22.2	...	21.0	...	20.3	...	20.1	20.0	19.9	19.7	19.4	19.1	18.7	18.4
39	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	29.8	29.8	29.7	29.6	29.6	29.5	29.5	29.2
40	30.0	...	28.2	...	26.1	...	24.7	...	23.9	...	23.7	23.6	23.4	23.2	22.9	22.4	22.0	21.6
41	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	25.4	25.3	25.2	25.2	25.1	25.1	25.1	24.8
42	25.5	...	24.0	...	22.2	...	21.0	...	20.3	...	20.1	20.0	19.9	19.7	19.4	19.1	18.7	18.4
43	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	22.8	22.6	22.4
44	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	16.9	16.7	16.6
45	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	22.8	22.6	22.4

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	16.0	...	12.4	...	6.0	...	3.5	...	...	...	...	...	...	...	...	...	...
28	16.0	14.9	12.4	9.3	6.0	4.8	3.5	...	...	...	...	...	...	...	...	...	...
29	16.0	14.9	12.4	9.3	6.0	4.8	3.5	...	...	...	...	...	...	...	...	...	...
30	29.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	29.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	21.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	29.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	21.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	29.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	21.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	24.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	18.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	29.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	21.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	24.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	18.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
44	16.5	16.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
45	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	54Ni-16Mo-15Cr	Forgings	SB-564	...	N10276	Solution ann.
2	54Ni-16Mo-15Cr	Forgings	SB-564	...	N10276	Solution ann.
3	54Ni-16Mo-15Cr	Rod	SB-574	...	N10276	Solution ann.
4	54Ni-16Mo-15Cr	Rod	SB-574	...	N10276	Solution ann.
5	54Ni-16Mo-15Cr	Plate, sheet, strip	SB-575	...	N10276	Solution ann.
6	54Ni-16Mo-15Cr	Plate, sheet, strip	SB-575	...	N10276	Solution ann.
7	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.
8	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.
9	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.
10	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.
11	54Ni-16Mo-15Cr	Smls. pipe & tube	SB-622	...	N10276	Solution ann.
12	54Ni-16Mo-15Cr	Smls. pipe & tube	SB-622	...	N10276	Solution ann.
13	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.
14	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.
15	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.
16	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.
17	62Ni-22Mo-15Cr	Smls. & wld. fittings	SB-366	...	N10362	Solution ann.
18	62Ni-22Mo-15Cr	Forgings	SB-462	...	N10362	Solution ann.
19	62Ni-22Mo-15Cr	Forgings	SB-462	...	N10362	Solution ann.
20	62Ni-22Mo-15Cr	Forgings	SB-564	...	N10362	Solution ann.
21	62Ni-22Mo-15Cr	Forgings	SB-564	...	N10362	Solution ann.
22	62Ni-22Mo-15Cr	Rod	SB-574	...	N10362	Solution ann.
23	62Ni-22Mo-15Cr	Rod	SB-574	...	N10362	Solution ann.
24	62Ni-22Mo-15Cr	Plate, sheet, strip	SB-575	...	N10362	Solution ann.
25	62Ni-22Mo-15Cr	Plate, sheet, strip	SB-575	...	N10362	Solution ann.
26	62Ni-22Mo-15Cr	Wld. pipe	SB-619	...	N10362	Solution ann.
27	62Ni-22Mo-15Cr	Wld. pipe	SB-619	...	N10362	Solution ann.
28	62Ni-22Mo-15Cr	Smls. pipe & tube	SB-622	...	N10362	Solution ann.
29	62Ni-22Mo-15Cr	Smls. pipe & tube	SB-622	...	N10362	Solution ann.
30	62Ni-22Mo-15Cr	Wld. tube	SB-626	...	N10362	Solution ann.
31	62Ni-22Mo-15Cr	Wld. tube	SB-626	...	N10362	Solution ann.
32	Ni-28Mo-3Fe-1.3Cr-0.25Al	Plate, sheet, strip	SB-333	...	N10629	Solution ann.
33	Ni-28Mo-3Fe-1.3Cr-0.25Al	Plate, sheet, strip	SB-333	...	N10629	Solution ann.
34	Ni-28Mo-3Fe-1.3Cr-0.25Al	Rod	SB-335	...	N10629	Solution ann.
35	Ni-28Mo-3Fe-1.3Cr-0.25Al	Rod	SB-335	...	N10629	Solution ann.
36	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. & wld. fittings	SB-366	...	N10629	Solution ann.
37	Ni-28Mo-3Fe-1.3Cr-0.25Al	Forged fittings	SB-462	...	N10629	Solution ann.
38	Ni-28Mo-3Fe-1.3Cr-0.25Al	Forged fittings	SB-462	...	N10629	Solution ann.
39	Ni-28Mo-3Fe-1.3Cr-0.25Al	Forgings	SB-564	...	N10629	Solution ann.
40	Ni-28Mo-3Fe-1.3Cr-0.25Al	Forgings	SB-564	...	N10629	Solution ann.
41	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. pipe	SB-619	...	N10629	Solution ann.
42	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. pipe	SB-619	...	N10629	Solution ann.
43	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. pipe & tube	SB-622	...	N10629	Solution ann.
44	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. pipe & tube	SB-622	...	N10629	Solution ann.
45	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. tube	SB-626	...	N10629	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	43	100	41	NP	NP	1250	650	NFN-10	T15
2	...	43	100	41	NP	NP	1250	650	NFN-10	G5, T14
3	...	43	100	41	1000	800 (Cl. 3 only)	1250	650	NFN-10	T15
4	...	43	100	41	1000	800	1250	650	NFN-10	G5, T14
5	...	43	100	41	1000	800	1250	650	NFN-10	G5, T14
6	...	43	100	41	1000	800 (Cl. 3 only)	1250	650	NFN-10	T15
7	...	43	100	41	NP	800 (Cl. 3 only)	NP	NP	NFN-10	W5
8	...	43	100	41	NP	800 (Cl. 3 only)	NP	NP	NFN-10	G5, W5
9	...	43	100	41	1000	800	1250	650	NFN-10	G5, G14, T14, W6
10	...	43	100	41	1000	NP	1250	650	NFN-10	G14, T15
11	...	43	100	41	1000	800	1250	650	NFN-10	G5, T14
12	...	43	100	41	1000	800 (Cl. 3 only)	1250	650	NFN-10	T15
13	...	43	100	41	NP	800 (Cl. 3 only)	NP	NP	NFN-10	W5
14	...	43	100	41	NP	800 (Cl. 3 only)	NP	NP	NFN-10	G5, W5
15	...	43	100	41	1000	800	1250	650	NFN-10	G5, G14, T14, W6
16	...	43	100	41	1000	NP	1250	650	NFN-10	G14, T15
17	...	43	105	45	NP	NP	800	NP	NFN-10	G5, W12
18	...	43	105	45	NP	NP	800	NP	NFN-10	...
19	...	43	105	45	NP	NP	800	NP	NFN-10	G5
20	...	43	105	45	NP	NP	800	NP	NFN-10	...
21	...	43	105	45	NP	NP	800	NP	NFN-10	G5
22	...	43	105	45	NP	NP	800	NP	NFN-10	...
23	...	43	105	45	NP	NP	800	NP	NFN-10	G5
24	...	43	105	45	NP	NP	800	NP	NFN-10	...
25	...	43	105	45	NP	NP	800	NP	NFN-10	G5
26	...	43	105	45	NP	NP	800	NP	NFN-10	G14
27	...	43	105	45	NP	NP	800	NP	NFN-10	G5, G14
28	...	43	105	45	NP	NP	800	NP	NFN-10	...
29	...	43	105	45	NP	NP	800	NP	NFN-10	G5
30	...	43	105	45	NP	NP	800	NP	NFN-10	G14
31	...	43	105	45	NP	NP	800	NP	NFN-10	G5, G14
32	...	44	110	51	NP	NP	800	NP	NFN-16	G5
33	...	44	110	51	NP	NP	800	NP	NFN-16	...
34	...	44	110	51	NP	NP	800	NP	NFN-16	G5
35	...	44	110	51	NP	NP	800	NP	NFN-16	...
36	...	44	110	51	NP	NP	800	NP	NFN-16	G5, W12
37	...	44	110	51	NP	NP	800	NP	NFN-16	G5
38	...	44	110	51	NP	NP	800	NP	NFN-16	...
39	...	44	110	51	NP	NP	800	NP	NFN-16	G5
40	...	44	110	51	NP	NP	800	NP	NFN-16	...
41	...	44	110	51	NP	NP	800	NP	NFN-16	G5, G14
42	...	44	110	51	NP	NP	800	NP	NFN-16	G14
43	...	44	110	51	NP	NP	800	NP	NFN-16	G5
44	...	44	110	51	NP	NP	800	NP	NFN-16	...
45	...	44	110	51	NP	NP	800	NP	NFN-16	G5, G14

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	16.9	16.7	16.6
2	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	22.8	22.6	22.4
3	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	16.9	16.7	16.6
4	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	22.8	22.6	22.4
5	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	22.8	22.6	22.4
6	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	16.9	16.7	16.6
7	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	...	...	...
8	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	...	...	...
9	23.2	...	23.2	...	23.2	...	23.2	...	22.8	...	21.5	20.9	20.4	20.0	19.6	19.4	19.2	19.0
10	23.2	...	21.1	...	19.6	...	18.1	...	16.9	...	15.9	15.5	15.1	14.8	14.5	14.3	14.2	14.1
11	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	22.8	22.6	22.4
12	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	16.9	16.7	16.6
13	27.3	...	24.9	...	23.0	...	21.3	...	19.9	...	18.7	18.2	17.8	17.4	17.1	...	...	...
14	27.3	...	27.3	...	27.3	...	27.3	...	26.9	...	25.2	24.6	24.0	23.5	23.1	...	...	...
15	23.2	...	23.2	...	23.2	...	23.2	...	22.8	...	21.5	20.9	20.4	20.0	19.6	19.4	19.2	19.0
16	23.2	...	21.1	...	19.6	...	18.1	...	16.9	...	15.9	15.5	15.1	14.8	14.5	14.3	14.2	14.1
17	30.0	...	30.0	...	30.0	...	29.6	...	28.8	...	27.7	27.3	27.0	26.7	26.4	...	...	...
18	30.0	...	26.7	...	24.5	...	22.7	...	21.4	...	20.5	20.2	20.0	19.8	19.6	...	...	...
19	30.0	...	30.0	...	30.0	...	29.6	...	28.8	...	27.7	27.3	27.0	26.7	26.4	...	...	...
20	30.0	...	26.7	...	24.5	...	22.7	...	21.4	...	20.5	20.2	20.0	19.8	19.6	...	...	...
21	30.0	...	30.0	...	30.0	...	29.6	...	28.8	...	27.7	27.3	27.0	26.7	26.4	...	...	...
22	30.0	...	26.7	...	24.5	...	22.7	...	21.4	...	20.5	20.2	20.0	19.8	19.6	...	...	...
23	30.0	...	30.0	...	30.0	...	29.6	...	28.8	...	27.7	27.3	27.0	26.7	26.4	...	...	...
24	30.0	...	26.7	...	24.5	...	22.7	...	21.4	...	20.5	20.2	20.0	19.8	19.6	...	...	...
25	30.0	...	30.0	...	30.0	...	29.6	...	28.8	...	27.7	27.3	27.0	26.7	26.4	...	...	...
26	25.5	...	22.7	...	20.8	...	19.3	...	18.2	...	17.4	17.2	17.0	16.8	16.7	...	...	...
27	25.5	...	25.5	...	25.5	...	25.2	...	24.5	...	23.5	23.2	23.0	22.7	22.4	...	...	...
28	30.0	...	26.7	...	24.5	...	22.7	...	21.4	...	20.5	20.2	20.0	19.8	19.6	...	...	...
29	30.0	...	30.0	...	30.0	...	29.6	...	28.8	...	27.7	27.3	27.0	26.7	26.4	...	...	...
30	25.5	...	22.7	...	20.8	...	19.3	...	18.2	...	17.4	17.2	17.0	16.8	16.7	...	...	...
31	25.5	...	25.5	...	25.5	...	25.2	...	24.5	...	23.5	23.2	23.0	22.7	22.4	...	...	...
32	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
33	31.4	...	31.4	...	29.6	...	28.1	...	27.0	...	26.1	25.8	25.5	25.3	25.1	...	...	...
34	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
35	31.4	...	31.4	...	29.6	...	28.1	...	27.0	...	26.1	25.8	25.5	25.3	25.1	...	...	...
36	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
37	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
38	31.4	...	31.4	...	29.6	...	28.1	...	27.0	...	26.1	25.8	25.5	25.3	25.1	...	...	...
39	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
40	31.4	...	31.4	...	29.6	...	28.1	...	27.0	...	26.1	25.8	25.5	25.3	25.1	...	...	...
41	26.7	...	26.7	...	26.7	...	26.7	...	26.4	...	26.0	25.8	25.7	25.6	25.4	...	...	...
42	26.7	...	26.7	...	25.2	...	23.9	...	23.0	...	22.2	21.9	21.7	21.5	21.3	...	...	...
43	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
44	31.4	...	31.4	...	29.6	...	28.1	...	27.0	...	26.1	25.8	25.5	25.3	25.1	...	...	...
45	26.7	...	26.7	...	26.7	...	26.7	...	26.4	...	26.0	25.8	25.7	25.6	25.4	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	16.5	16.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
2	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
3	16.5	16.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
4	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
5	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
6	16.5	16.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	19.0	15.7	12.8	10.4	8.3	6.6	...	...	...	...	...	...	...	...	...	...	...
10	14.0	14.0	12.8	10.4	8.3	6.6	...	...	...	...	...	...	...	...	...	...	...
11	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
12	16.5	16.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	19.0	15.7	12.8	10.4	8.3	6.6	...	...	...	...	...	...	...	...	...	...	...
16	14.0	14.0	12.8	10.4	8.3	6.6	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
(23) 1	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. tube	SB-626	...	N10629	Solution ann.
2	65Ni-28Mo-2Fe	Smls. & wld. fittings	SB-366	...	N10665	Annealed
3	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Annealed
4	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Annealed
5	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Annealed
6	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Annealed
7	65Ni-28Mo-2Fe	Plate, sheet, strip	SB-333	...	N10665	Solution ann.
8	65Ni-28Mo-2Fe	Plate, sheet, strip	SB-333	...	N10665	Solution ann.
9	65Ni-28Mo-2Fe	Rod	SB-335	...	N10665	Solution ann.
10	65Ni-28Mo-2Fe	Rod	SB-335	...	N10665	Solution ann.
11	65Ni-28Mo-2Fe	Forgings	SB-462	...	N10665	Solution ann.
12	65Ni-28Mo-2Fe	Forgings	SB-462	...	N10665	Solution ann.
13	65Ni-28Mo-2Fe	Forgings	SB-564	...	N10665	Solution ann.
14	65Ni-28Mo-2Fe	Forgings	SB-564	...	N10665	Solution ann.
15	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Solution ann.
16	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Solution ann.
17	65Ni-28Mo-2Fe	Smls. pipe & tube	SB-622	...	N10665	Solution ann.
18	65Ni-28Mo-2Fe	Smls. pipe & tube	SB-622	...	N10665	Solution ann.
19	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Solution ann.
20	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Solution ann.
21	65Ni-29.5Mo-2Fe-2Cr	Plate, sheet, strip	SB-333	...	N10675	Solution ann.
22	65Ni-29.5Mo-2Fe-2Cr	Plate, sheet, strip	SB-333	...	N10675	Solution ann.
23	65Ni-29.5Mo-2Fe-2Cr	Rod	SB-335	...	N10675	Solution ann.
24	65Ni-29.5Mo-2Fe-2Cr	Rod	SB-335	...	N10675	Solution ann.
25	65Ni-29.5Mo-2Fe-2Cr	Smls. & wld. fittings	SB-366	...	N10675	Solution ann.
26	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-462	...	N10675	Solution ann.
27	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-462	...	N10675	Solution ann.
28	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-564	...	N10675	Solution ann.
29	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-564	...	N10675	Solution ann.
30	65Ni-29.5Mo-2Fe-2Cr	Wld. pipe	SB-619	...	N10675	Solution ann.
31	65Ni-29.5Mo-2Fe-2Cr	Wld. pipe	SB-619	...	N10675	Solution ann.
32	65Ni-29.5Mo-2Fe-2Cr	Smls. pipe & tube	SB-622	...	N10675	Solution ann.
33	65Ni-29.5Mo-2Fe-2Cr	Smls. pipe & tube	SB-622	...	N10675	Solution ann.
34	65Ni-29.5Mo-2Fe-2Cr	Wld. tube	SB-626	...	N10675	Solution ann.
35	65Ni-29.5Mo-2Fe-2Cr	Wld. tube	SB-626	...	N10675	Solution ann.
36	37Ni-30Co-28Cr-2.7Si	Smls. & wld. fittings	SB-366	...	N12160	Solution ann.
37	37Ni-30Co-28Cr-2.7Si	Plate, sheet, strip	SB-435	...	N12160	Solution ann.
38	37Ni-30Co-28Cr-2.7Si	Plate, sheet, strip	SB-435	...	N12160	Solution ann.
39	37Ni-30Co-28Cr-2.7Si	Forgings	SB-564	...	N12160	Solution ann.
40	37Ni-30Co-28Cr-2.7Si	Forgings	SB-564	...	N12160	Solution ann.
41	37Ni-30Co-28Cr-2.7Si	Rod	SB-572	...	N12160	Solution ann.
42	37Ni-30Co-28Cr-2.7Si	Rod	SB-572	...	N12160	Solution ann.
43	37Ni-30Co-28Cr-2.7Si	Wld. pipe	SB-619	...	N12160	Solution ann.
44	37Ni-30Co-28Cr-2.7Si	Wld. pipe	SB-619	...	N12160	Solution ann.
45	37Ni-30Co-28Cr-2.7Si	Smls. pipe & tube	SB-622	...	N12160	Solution ann.

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	44	110	51	NP	NP	800	NP	NFN-16	G14
2	...	44	110	51	NP	800 (Cl. 3 only)	800	650	NFN-16	G5, W5, W12
3	...	44	110	51	NP	800 (Cl. 3 only)	NP	NP	NFN-16	G5, W5
4	...	44	110	51	NP	800 (Cl. 3 only)	NP	NP	NFN-16	W5
5	...	44	110	51	NP	800 (Cl. 3 only)	NP	NP	NFN-16	G5, W5
6	...	44	110	51	NP	800 (Cl. 3 only)	NP	NP	NFN-16	W5
7	...	44	110	51	NP	800 (Cl. 3 only)	800	650	NFN-16	...
8	...	44	110	51	NP	800 (Cl. 3 only)	800	NP	NFN-16	G5
9	...	44	110	51	NP	800 (Cl. 3 only)	800	650	NFN-16	G13
10	...	44	110	51	NP	800 (Cl. 3 only)	800	650	NFN-16	G5, G13
11	...	44	110	51	NP	NP	800	NP	NFN-16	...
12	...	44	110	51	NP	NP	800	NP	NFN-16	G5
13	...	44	110	51	NP	NP	800	NP	NFN-16	...
14	...	44	110	51	NP	NP	800	NP	NFN-16	G5
15	...	44	110	51	NP	NP	800	650	NFN-16	G14
16	...	44	110	51	NP	NP	800	650	NFN-16	G5, G14
17	...	44	110	51	NP	800 (Cl. 3 only)	800	650	NFN-16	...
18	...	44	110	51	NP	800 (Cl. 3 only)	800	650	NFN-16	G5
19	...	44	110	51	NP	NP	800	650	NFN-16	G5, G14
20	...	44	110	51	NP	NP	800	650	NFN-16	G14
21	...	44	110	51	NP	NP	800	650	NFN-16	G5
22	...	44	110	51	NP	NP	800	650	NFN-16	...
23	...	44	110	51	NP	NP	800	650	NFN-16	G5
24	...	44	110	51	NP	NP	800	650	NFN-16	...
25	...	44	110	51	NP	NP	800	650	NFN-16	G5, W12
26	...	44	110	51	NP	NP	800	NP	NFN-16	G5
27	...	44	110	51	NP	NP	800	NP	NFN-16	...
28	...	44	110	51	NP	NP	800	650	NFN-16	G5
29	...	44	110	51	NP	NP	800	650	NFN-16	...
30	...	44	110	51	NP	NP	800	650	NFN-16	G5, G14
31	...	44	110	51	NP	NP	800	650	NFN-16	G14
32	...	44	110	51	NP	NP	800	650	NFN-16	G5
33	...	44	110	51	NP	NP	800	650	NFN-16	...
34	...	44	110	51	NP	NP	800	650	NFN-16	G5, G14
35	...	44	110	51	NP	NP	800	650	NFN-16	G14
36	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, T14, W12
37	...	46	90	35	NP	NP	1500	NP	NFN-13	T14
38	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, T14
39	...	46	90	35	NP	NP	1500	NP	NFN-13	T14
40	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, T14
41	...	46	90	35	NP	NP	1500	NP	NFN-13	T14
42	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, T14
43	...	46	90	35	NP	NP	1500	NP	NFN-13	G14, T14
44	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, G14, T14
45	...	46	90	35	NP	NP	1500	NP	NFN-13	T14

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	26.7	...	26.7	...	25.2	...	23.9	...	23.0	...	22.2	21.9	21.7	21.5	21.3	...	...	...
2	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
3	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
4	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
5	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
6	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
7	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
8	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
9	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
10	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
11	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
12	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
13	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
14	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
15	26.7	...	26.7	...	25.7	...	24.6	...	23.7	...	23.1	22.9	22.6	22.3	21.9	...	...	...
16	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.5	26.4	26.3	26.1	26.0	...	...	...
17	31.4	...	31.4	...	30.2	...	28.9	...	27.9	...	27.2	26.9	26.6	26.2	25.8	...	...	...
18	31.4	...	31.4	...	31.4	...	31.4	...	31.4	...	31.2	31.1	30.9	30.7	30.6	...	...	...
19	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.5	26.4	26.3	26.1	26.0	...	...	...
20	26.7	...	26.7	...	25.7	...	24.6	...	23.7	...	23.1	22.9	22.6	22.3	21.9	...	...	...
21	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
22	31.4	...	31.4	...	30.3	...	28.8	...	27.4	...	26.3	25.8	25.4	25.1	24.8	...	...	...
23	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
24	31.4	...	31.4	...	30.3	...	28.8	...	27.4	...	26.3	25.8	25.4	25.1	24.8	...	...	...
25	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
26	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
27	31.4	...	31.4	...	30.3	...	28.8	...	27.4	...	26.3	25.8	25.4	25.1	24.8	...	...	...
28	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
29	31.4	...	31.4	...	30.3	...	28.8	...	27.4	...	26.3	25.8	25.4	25.1	24.8	...	...	...
30	26.7	...	26.7	...	26.7	...	26.7	...	26.4	...	26.0	25.8	25.7	25.6	25.4	...	...	...
31	26.7	...	26.7	...	25.8	...	24.5	...	23.4	...	22.4	21.9	21.6	21.3	21.1	...	...	...
32	31.4	...	31.4	...	31.4	...	31.4	...	31.1	...	30.6	30.4	30.2	30.1	29.9	...	...	...
33	31.4	...	31.4	...	30.3	...	28.8	...	27.4	...	26.3	25.8	25.4	25.1	24.8	...	...	...
34	26.7	...	26.7	...	26.7	...	26.7	...	26.4	...	26.0	25.8	25.7	25.6	25.4	...	...	...
35	26.7	...	26.7	...	25.8	...	24.5	...	23.4	...	22.4	21.9	21.6	21.3	21.1	...	...	...
36	23.3	...	23.3	...	23.3	...	22.2	...	20.3	...	19.0	18.6	18.4	18.3	18.3	18.3	18.3	18.3
37	23.3	...	20.5	...	18.3	...	16.5	...	15.0	...	14.1	13.8	13.6	13.6	13.5	13.5	13.5	13.5
38	23.3	...	23.3	...	23.3	...	22.2	...	20.3	...	19.0	18.6	18.4	18.3	18.3	18.3	18.3	18.3
39	23.3	...	20.5	...	18.3	...	16.5	...	15.0	...	14.1	13.8	13.6	13.6	13.5	13.5	13.5	13.5
40	23.3	...	23.3	...	23.3	...	22.2	...	20.3	...	19.0	18.6	18.4	18.3	18.3	18.3	18.3	18.3
41	23.3	...	20.5	...	18.3	...	16.5	...	15.0	...	14.1	13.8	13.6	13.6	13.5	13.5	13.5	13.5
42	23.3	...	23.3	...	23.3	...	22.2	...	20.3	...	19.0	18.6	18.4	18.3	18.3	18.3	18.3	18.3
43	19.8	...	17.4	...	15.6	...	14.0	...	12.8	...	12.0	11.7	11.6	11.6	11.5	11.5	11.5	11.5
44	19.8	...	19.8	...	19.8	...	18.9	...	17.3	...	16.2	15.8	15.6	15.6	15.6	15.6	15.6	15.6
45	23.3	...	20.5	...	18.3	...	16.5	...	15.0	...	14.1	13.8	13.6	13.6	13.5	13.5	13.5	13.5

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	16.6	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
37	13.5	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
38	16.6	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
39	13.5	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
40	16.6	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
41	13.5	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
42	16.6	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
43	11.5	11.5	9.4	7.7	6.4	5.3	4.3	3.7	3.1	2.6	2.1	...	...	...	...	...	...
44	14.1	11.5	9.4	7.7	6.4	5.3	4.3	3.7	3.1	2.6	2.1	...	...	...	...	...	...
45	13.5	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...

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Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	37Ni-30Co-28Cr-2.7Si	Smls. pipe & tube	SB-622	...	N12160	Solution ann.
2	37Ni-30Co-28Cr-2.7Si	Wld. tube	SB-626	...	N12160	Solution ann.
3	37Ni-30Co-28Cr-2.7Si	Wld. tube	SB-626	...	N12160	Solution ann.
4	59Ni-22Cr-14Mo-4Fe-3W	Castings	SA-494	CX2MW	N26022	Solution ann.
5	53Ni-17Mo-16Cr-6Fe-5W	Castings	SA-494	CW-12MW/C	N30002	Annealed
6	62Ni-28Mo-5Fe	Castings	SA-494	N-12MV/B	N30012	Annealed
7	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Smls. & wld. fittings	SB-366	...	R20033	Solution ann.
8	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Forged fittings	SB-462	...	R20033	Solution ann.
9	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Forgings	SB-564	...	R20033	Solution ann.
10	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Wld. pipe	SB-619	...	R20033	Solution ann.
11	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Smls. pipe & tube	SB-622	...	R20033	Solution ann.
12	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Plate, sheet, strip	SB-625	...	R20033	Solution ann.
13	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Wld. tube	SB-626	...	R20033	Solution ann.
14	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Rod	SB-649	...	R20033	Solution ann.
15	21Ni-30Fe-22Cr-18Co-3Mo-3W	Plate, sheet, strip	SB-435	...	R30556	Annealed
16	21Ni-30Fe-22Cr-18Co-3Mo-3W	Plate, sheet, strip	SB-435	...	R30556	Annealed
17	21Ni-30Fe-22Cr-18Co-3Mo-3W	Rod	SB-572	...	R30556	Annealed
18	21Ni-30Fe-22Cr-18Co-3Mo-3W	Rod	SB-572	...	R30556	Annealed
19	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. pipe	SB-619	...	R30556	Annealed
20	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. pipe	SB-619	...	R30556	Annealed
21	21Ni-30Fe-22Cr-18Co-3Mo-3W	Smls. pipe & tube	SB-622	...	R30556	Annealed
22	21Ni-30Fe-22Cr-18Co-3Mo-3W	Smls. pipe & tube	SB-622	...	R30556	Annealed
23	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. tube	SB-626	...	R30556	Annealed
24	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. tube	SB-626	...	R30556	Annealed
25	Co-26Cr-9Ni-5Mo-3Fe-2W	Rod	SB-815	...	R31233	Solution ann.
26	Co-26Cr-9Ni-5Mo-3Fe-2W	Plate, sheet, strip	SB-818	...	R31233	Solution ann.
27	Ti	Plate, sheet, strip	SB-265	1	R50250	Annealed
28	Ti	Smls. tube	SB-338	1	R50250	Annealed
29	Ti	Wld. tube	SB-338	1	R50250	Annealed
30	Ti	Bar, billet	SB-348	1	R50250	Annealed
31	Ti	Smls. & wld. fittings	SB-363	WPT1	R50250	Annealed
32	Ti	Forgings	SB-381	F-1	R50250	Annealed
33	Ti	Smls. pipe	SB-861	1	R50250	Annealed
34	Ti	Wld. pipe	SB-862	1	R50250	Annealed
35	Ti	Castings	SB-367	C-2	R50400	...
36	Ti	Plate, sheet, strip	SB-265	2	R50400	Annealed
37	Ti	Smls. tube	SB-338	2	R50400	Annealed
38	Ti	Wld. tube	SB-338	2	R50400	Annealed
39	Ti	Bar, billet	SB-348	2	R50400	Annealed
40	Ti	Smls. & wld. fittings	SB-363	WPT2	R50400	Annealed
41	Ti	Forgings	SB-381	F-2	R50400	Annealed
42	Ti	Smls. pipe	SB-861	2	R50400	Annealed
43	Ti	Wld. pipe	SB-862	2	R50400	Annealed
44	Ti	Plate, sheet, strip	SB-265	2H	R50400	Annealed
45	Ti	Smls. tube	SB-338	2H	R50400	Annealed

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, T14
2	...	46	90	35	NP	NP	1500	NP	NFN-13	G14, T14
3	...	46	90	35	NP	NP	1500	NP	NFN-13	G5, G14, T14
4	...	43	80	45	NP	NP	500	500	NFN-10	G15
5	...	...	72	40	NP	NP	1000	650	NFN-10	G15, W1
6	...	...	76	40	NP	NP	1000	650	NFN-10	G15, W1
7	...	45	109	55	NP	NP	800	NP	NFN-10	W12
8	...	45	109	55	NP	NP	800	NP	NFN-10	...
9	...	45	109	55	NP	NP	800	NP	NFN-10	...
10	...	45	109	55	NP	NP	800	NP	NFN-10	G14
11	...	45	109	55	NP	NP	800	NP	NFN-10	...
12	...	45	109	55	NP	NP	800	NP	NFN-10	...
13	...	45	109	55	NP	NP	800	NP	NFN-10	G14
14	...	45	109	55	NP	NP	800	NP	NFN-10	...
15	...	45	100	45	NP	NP	1650	650	NFN-15	G4, T17
16	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G5, T16
17	...	45	100	45	NP	NP	1650	650	NFN-15	G4, T17
18	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G5, T16
19	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G14, T16
20	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G5, G14, T15
21	...	45	100	45	NP	NP	1650	650	NFN-15	G4, T17
22	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G5, T16
23	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G14, T16
24	...	45	100	45	NP	NP	1650	650	NFN-15	G4, G5, G14, T15
25	...	49	130	55	NP	NP	800	NP	NFN-15	G8
26	...	49	130	55	NP	NP	800	NP	NFN-15	G8
27	...	51	35	20	600	600	600	NP	NFT-3	...
28	...	51	35	20	600	600	600	NP	NFT-3	...
29	...	51	35	20	600	600	600	NP	NFT-3	G14, W6
30	...	51	35	20	600	600	600	NP	NFT-3	...
31	...	51	35	20	NP	600	600	NP	NFT-3	W5, W12
32	...	51	35	20	NP	600	600	NP	NFT-3	...
33	...	51	35	20	600	600	600	NP	NFT-3	...
34	...	51	35	20	600	600	600	NP	NFT-3	G14, W6
35	...	51	50	40	NP	NP	500	500	NFT-2	G15
36	...	51	50	40	600	600	600	600	NFT-2	...
37	...	51	50	40	600	600	600	600	NFT-2	...
38	...	51	50	40	600	600	600	600	NFT-2	G14, W6
39	...	51	50	40	600	600	600	600	NFT-2	...
40	...	51	50	40	NP	600	600	600	NFT-2	W5, W12
41	...	51	50	40	NP	600	600	600	NFT-2	...
42	...	51	50	40	600	600	600	600	NFT-2	...
43	...	51	50	40	600	600	600	600	NFT-2	G14, W6
44	...	51	58	40	NP	NP	600	NP	NFT-2	...
45	...	51	58	40	NP	NP	600	NP	NFT-2	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	23.3	...	23.3	...	23.3	...	22.2	...	20.3	...	19.0	18.6	18.4	18.3	18.3	18.3	18.3	18.3
2	19.8	...	17.4	...	15.6	...	14.0	...	12.8	...	12.0	11.7	11.6	11.6	11.5	11.5	11.5	11.5
3	19.8	...	19.8	...	19.8	...	18.9	...	17.3	...	16.2	15.8	15.6	15.6	15.6	15.6	15.6	15.6
4	22.9	...	22.2	...	21.6	...	21.4	...	21.4	...	...	...	...	...	...	...	...	...
5	20.6	...	19.5	...	18.5	...	18.5	...	18.1	...	16.9	16.9	16.9	16.9	16.9	16.9	16.5	16.1
6	21.7	...	20.3	...	20.3	...	20.3	...	20.3	...	18.6	18.3	18.0	17.7	17.3	17.0	16.6	16.2
7	31.1	...	30.9	...	28.1	...	26.1	...	24.8	...	23.6	23.5	23.1	22.9	22.6	...	...	...
8	31.1	...	30.9	...	28.1	...	26.1	...	24.8	...	23.6	23.5	23.1	22.9	22.6	...	...	...
9	31.1	...	30.9	...	28.1	...	26.1	...	24.8	...	23.6	23.5	23.1	22.9	22.6	...	...	...
10	26.4	...	26.3	...	23.9	...	22.2	...	21.1	...	20.1	20.0	19.6	19.5	19.2	...	...	...
11	31.1	...	30.9	...	28.1	...	26.1	...	24.8	...	23.6	23.5	23.1	22.9	22.6	...	...	...
12	31.1	...	30.9	...	28.1	...	26.1	...	24.8	...	23.6	23.5	23.1	22.9	22.6	...	...	...
13	26.4	...	26.3	...	23.9	...	22.2	...	21.1	...	20.1	20.0	19.6	19.5	19.2	...	...	...
14	31.1	...	30.9	...	28.1	...	26.1	...	24.8	...	23.6	23.5	23.1	22.9	22.6	...	...	...
15	28.6	...	25.6	...	23.1	...	21.3	...	20.1	...	19.3	18.9	18.7	18.4	18.2	18.0	17.8	17.6
16	28.6	...	28.6	...	28.0	...	27.1	...	26.4	...	26.0	25.6	25.2	24.9	24.6	24.3	24.1	23.8
17	28.6	...	25.6	...	23.1	...	21.3	...	20.1	...	19.3	18.9	18.7	18.4	18.2	18.0	17.8	17.6
18	28.6	...	28.6	...	28.0	...	27.1	...	26.4	...	26.0	25.6	25.2	24.9	24.6	24.3	24.1	23.8
19	24.3	...	21.8	...	19.6	...	18.1	...	17.1	...	16.4	16.1	15.9	15.7	15.5	15.3	15.2	15.0
20	24.3	...	24.3	...	23.8	...	23.0	...	22.5	...	22.1	21.7	21.4	21.1	20.9	20.7	20.5	20.2
21	28.6	...	25.6	...	23.1	...	21.3	...	20.1	...	19.3	18.9	18.7	18.4	18.2	18.0	17.8	17.6
22	28.6	...	28.6	...	28.0	...	27.1	...	26.4	...	26.0	25.6	25.2	24.9	24.6	24.3	24.1	23.8
23	24.3	...	21.8	...	19.6	...	18.1	...	17.1	...	16.4	16.1	15.9	15.7	15.5	15.3	15.2	15.0
24	24.3	...	24.3	...	23.8	...	23.0	...	22.5	...	22.1	21.7	21.4	21.1	20.9	20.7	20.5	20.2
25	34.2	...	32.1	...	28.5	...	25.5	...	23.4	...	22.0	21.5	21.2	20.9	20.5	...	...	...
26	34.2	...	32.1	...	28.5	...	25.5	...	23.4	...	22.0	21.5	21.2	20.9	20.5	...	...	...
27	10.0	9.3	8.3	7.4	6.6	6.0	5.4	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
28	10.0	9.3	8.3	7.4	6.6	6.0	5.5	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
29	8.5	7.9	7.0	6.3	5.6	5.1	4.7	4.1	3.6	3.2	3.0	...	...	...	...	...	...	...
30	10.0	9.3	8.3	7.4	6.6	6.0	5.5	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
31	10.0	9.3	8.3	7.4	6.6	6.0	5.5	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
32	10.0	9.3	8.3	7.4	6.6	6.0	5.5	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
33	10.0	9.3	8.3	7.4	6.6	6.0	5.5	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
34	8.5	7.9	7.0	6.3	5.6	5.1	4.7	4.1	3.6	3.2	3.0	...	...	...	...	...	...	...
35	14.3	13.1	11.8	10.7	9.7	8.9	8.1	7.4	6.8	...	...	...	...	...	...	...	...	...
36	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
37	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
38	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
39	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
40	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
41	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
42	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
43	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
44	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
45	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	16.6	13.5	11.0	9.1	7.5	6.2	5.1	4.3	3.6	3.0	2.5	...	...	...	...	...	...
2	11.5	11.5	9.4	7.7	6.4	5.3	4.3	3.7	3.1	2.6	2.1	...	...	...	...	...	...
3	14.1	11.5	9.4	7.7	6.4	5.3	4.3	3.7	3.1	2.6	2.1	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	15.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	15.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	17.5	17.3	17.1	16.9	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.7	2.1	1.6	...	...	...
16	23.6	23.3	21.2	17.0	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.7	2.1	1.6	...	...	...
17	17.5	17.3	17.1	16.9	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.7	2.1	1.6	...	...	...
18	23.6	23.3	21.2	17.0	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.7	2.1	1.6	...	...	...
19	14.8	14.7	14.5	14.4	11.6	9.3	7.5	6.0	4.8	3.8	3.1	2.3	1.8	1.4	...	...	...
20	20.0	19.8	18.0	14.4	11.6	9.3	7.5	6.0	4.8	3.8	3.1	2.3	1.8	1.4	...	...	...
21	17.5	17.3	17.1	16.9	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.7	2.1	1.6	...	...	...
22	23.6	23.3	21.2	17.0	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.7	2.1	1.6	...	...	...
23	14.8	14.7	14.5	14.4	11.6	9.3	7.5	6.0	4.8	3.8	3.1	2.3	1.8	1.4	...	...	...
24	20.0	19.8	18.0	14.4	11.6	9.3	7.5	6.0	4.8	3.8	3.1	2.3	1.8	1.4	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	Ti	Wld. tube	SB-338	2H	R50400	Annealed
2	Ti	Bar, billet	SB-348	2H	R50400	Annealed
3	Ti	Smls. fittings	SB-363	WPT2H	R50400	Annealed
4	Ti	Wld. fittings	SB-363	WPT2HW	R50400	Annealed
5	Ti	Forgings	SB-381	F-2H	R50400	Annealed
6	Ti	Smls. pipe	SB-861	2H	R50400	Annealed
7	Ti	Wld. pipe	SB-862	2H	R50400	Annealed
8	Ti	Castings	SB-367	C-3	R50550	...
9	Ti	Plate, sheet, strip	SB-265	3	R50550	Annealed
10	Ti	Smls. tube	SB-338	3	R50550	Annealed
11	Ti	Wld. tube	SB-338	3	R50550	Annealed
12	Ti	Bar, billet	SB-348	3	R50550	Annealed
13	Ti	Smls. & wld. fittings	SB-363	WPT3	R50550	Annealed
14	Ti	Forgings	SB-381	F-3	R50550	Annealed
15	Ti	Smls. pipe	SB-861	3	R50550	Annealed
16	Ti	Wld. pipe	SB-862	3	R50550	Annealed
17	Ti-Pd	Plate, sheet, strip	SB-265	11	R52250	Annealed
18	Ti-Pd	Plate, sheet, strip	SB-265	17	R52252	Annealed
19	Ti-Ru	Plate, sheet, strip	SB-265	27	R52254	Annealed
20	Ti-Pd	Plate, sheet, strip	SB-265	7	R52400	Annealed
21	Ti-Pd	Smls. tube	SB-338	7	R52400	Annealed
22	Ti-Pd	Wld. tube	SB-338	7	R52400	Annealed
23	Ti-Pd	Bar, billet	SB-348	7	R52400	Annealed
24	Ti-Pd	Smls. fittings	SB-363	WPT7	R52400	Annealed
25	Ti-Pd	Wld. fittings	SB-363	WPT7HW	R52400	Annealed
26	Ti-Pd	Castings	SB-367	C-7	R52400	Annealed
27	Ti-Pd	Forgings	SB-381	F-7	R52400	Annealed
28	Ti-Pd	Smls. pipe	SB-861	7	R52400	Annealed
29	Ti-Pd	Wld. pipe	SB-862	7	R52400	Annealed
30	Ti-0.15Pd	Plate, sheet, strip	SB-265	7H	R52400	Annealed
31	Ti-0.15Pd	Smls. tube	SB-338	7H	R52400	Annealed
32	Ti-0.15Pd	Wld. tube	SB-338	7H	R52400	Annealed
33	Ti-0.15Pd	Bar, billet	SB-348	7H	R52400	Annealed
34	Ti-0.15Pd	Smls. fittings	SB-363	WPT7H	R52400	Annealed
35	Ti-0.15Pd	Wld. fittings	SB-363	WPT7HW	R52400	Annealed
36	Ti-0.15Pd	Forgings	SB-381	F-7H	R52400	Annealed
37	Ti-0.15Pd	Smls. pipe	SB-861	7H	R52400	Annealed
38	Ti-0.15Pd	Wld. pipe	SB-862	7H	R52400	Annealed
39	Ti-Pd	Plate, sheet, strip	SB-265	16	R52402	Annealed
40	Ti-Pd	Smls. tube	SB-338	16	R52402	Annealed
41	Ti-Pd	Wld. tube	SB-338	16	R52402	Annealed
42	Ti-Pd	Bar, billet	SB-348	16	R52402	Annealed
43	Ti-Pd	Forgings	SB-381	F-16	R52402	Annealed
44	Ti-0.05Pd	Plate, sheet, strip	SB-265	16H	R52402	Annealed
45	Ti-0.05Pd	Smls. tube	SB-338	16H	R52402	Annealed

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	51	58	40	NP	NP	600	NP	NFT-2	G14, W6
2	...	51	58	40	NP	NP	600	NP	NFT-2	...
3	...	51	58	40	NP	NP	600	NP	NFT-2	...
4	...	51	58	40	NP	NP	600	NP	NFT-2	W12
5	...	51	58	40	NP	NP	600	NP	NFT-2	...
6	...	51	58	40	NP	NP	600	NP	NFT-2	...
7	...	51	58	40	NP	NP	600	NP	NFT-2	W12
8	...	52	65	55	NP	NP	500	NP	NFT-1	G15
9	...	52	65	55	600	600	600	600	NFT-1	...
10	...	52	65	55	600	600	600	600	NFT-1	...
11	...	52	65	55	600	600	600	600	NFT-1	G14, W6
12	...	52	65	55	600	600	600	600	NFT-1	...
13	...	52	65	55	NP	600	600	600	NFT-1	W5, W12
14	...	52	65	55	NP	600	600	600	NFT-1	...
15	...	52	65	55	600	600	600	600	NFT-1	...
16	...	52	65	55	600	600	600	600	NFT-1	G14, W6
17	...	51	35	20	NP	NP	600	NP	NFT-3	...
18	...	51	35	20	NP	NP	600	NP	NFT-3	...
19	...	51	35	20	NP	NP	600	NP	NFT-3	...
20	...	51	50	40	NP	600	600	600	NFT-2	...
21	...	51	50	40	NP	600	600	600	NFT-2	...
22	...	51	50	40	NP	600	600	600	NFT-2	G14, W6
23	...	51	50	40	NP	600	600	600	NFT-2	...
24	...	51	50	40	NP	NP	600	600	NFT-2	...
25	...	51	50	40	NP	NP	600	600	NFT-2	G14
26	...	51	50	40	NP	NP	500	500	NFT-2	G15
27	...	51	50	40	NP	NP	600	600	NFT-2	...
28	...	51	50	40	NP	600	600	600	NFT-2	...
29	...	51	50	40	NP	600	600	600	NFT-2	G14, W6
30	...	51	58	40	NP	NP	600	NP	NFT-2	...
31	...	51	58	40	NP	NP	600	NP	NFT-2	...
32	...	51	58	40	NP	NP	600	NP	NFT-2	G14, W6
33	...	51	58	40	NP	NP	600	NP	NFT-2	...
34	...	51	58	40	NP	NP	600	NP	NFT-2	...
35	...	51	58	40	NP	NP	600	NP	NFT-2	W12
36	...	51	58	40	NP	NP	600	NP	NFT-2	...
37	...	51	58	40	NP	NP	600	NP	NFT-2	...
38	...	51	58	40	NP	NP	600	NP	NFT-2	W12
39	...	51	50	40	NP	NP	600	600	NFT-2	...
40	...	51	50	40	NP	NP	600	600	NFT-2	...
41	...	51	50	40	NP	NP	600	600	NFT-2	G14, W6
42	...	51	50	40	NP	NP	600	600	NFT-2	...
43	...	51	50	40	NP	NP	600	600	NFT-2	...
44	...	51	58	40	NP	NP	600	NP	NFT-2	...
45	...	51	58	40	NP	NP	600	NP	NFT-2	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	14.1	13.5	12.3	11.2	10.2	9.4	8.7	8.1	7.5	6.9	6.4	...	...	...	...	...	...	...
2	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
3	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
4	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
5	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
6	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
7	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
8	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	...	...	...	...	...	...	...	...	...
9	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	7.9	7.4	...	...	...	...	...	...	...
10	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	7.9	7.4	...	...	...	...	...	...	...
11	15.8	14.9	13.4	12.1	10.8	9.7	8.8	7.9	7.2	6.7	6.3	...	...	...	...	...	...	...
12	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	7.9	7.4	...	...	...	...	...	...	...
13	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	7.9	7.4	...	...	...	...	...	...	...
14	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	7.9	7.4	...	...	...	...	...	...	...
15	18.6	17.5	15.8	14.2	12.8	11.5	10.3	9.3	8.5	7.9	7.4	...	...	...	...	...	...	...
16	15.8	14.9	13.4	12.1	10.8	9.7	8.8	7.9	7.2	6.7	6.3	...	...	...	...	...	...	...
17	10.0	9.3	8.3	7.4	6.6	6.0	5.4	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
18	10.0	9.3	8.3	7.4	6.6	6.0	5.4	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
19	10.0	9.3	8.3	7.4	6.6	6.0	5.4	4.7	4.2	3.8	3.5	...	...	...	...	...	...	...
20	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
21	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
22	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
23	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
24	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
25	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
26	14.3	13.1	11.8	10.7	9.7	8.9	8.1	7.4	6.8	...	...	...	...	...	...	...	...	...
27	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
28	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
29	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
30	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
31	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
32	14.1	13.5	12.3	11.2	10.2	9.4	8.7	8.1	7.5	6.9	6.4	...	...	...	...	...	...	...
33	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
34	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
35	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
36	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
37	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
38	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
39	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
40	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
41	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
42	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
43	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
44	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
45	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
 (*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
1	Ti-0.05Pd	Wld. tube	SB-338	16H	R52402	Annealed
2	Ti-0.05Pd	Bar, billet	SB-348	16H	R52402	Annealed
3	Ti-0.05Pd	Smls. fittings	SB-363	WPT16H	R52402	Annealed
4	Ti-0.05Pd	Wld. fittings	SB-363	WPT16HW	R52402	Annealed
5	Ti-0.05Pd	Forgings	SB-381	F-16H	R52402	Annealed
6	Ti-0.05Pd	Smls. pipe	SB-861	16H	R52402	Annealed
7	Ti-0.05Pd	Wld. pipe	SB-862	16H	R52402	Annealed
8	Ti-Ru	Plate, sheet, strip	SB-265	26	R52404	Annealed
9	Ti-Ru	Smls. tube	SB-338	26	R52404	Annealed
10	Ti-Ru	Wld. tube	SB-338	26	R52404	Annealed
11	Ti-Ru	Bar, billet	SB-348	26	R52404	Annealed
12	Ti-Ru	Smls. fittings	SB-363	WPT26	R52404	Annealed
13	Ti-Ru	Wld. fittings	SB-363	WPT26W	R52404	Annealed
14	Ti-Ru	Forgings	SB-381	F-26	R52404	Annealed
15	Ti-Ru	Smls. pipe	SB-861	26	R52404	Annealed
16	Ti-Ru	Wld. pipe	SB-862	26	R52404	Annealed
17	Ti-0.10Ru	Plate, sheet, strip	SB-265	26H	R52404	Annealed
18	Ti-0.10Ru	Smls. tube	SB-338	26H	R52404	Annealed
19	Ti-0.10Ru	Wld. tube	SB-338	26H	R52404	Annealed
20	Ti-0.10Ru	Bar, billet	SB-348	26H	R52404	Annealed
21	Ti-0.10Ru	Smls. fittings	SB-363	WPT26H	R52404	Annealed
22	Ti-0.10Ru	Wld. fittings	SB-363	WPT26HW	R52404	Annealed
23	Ti-0.10Ru	Forgings	SB-381	F-26H	R52404	Annealed
24	Ti-0.10Ru	Smls. pipe	SB-861	26H	R52404	Annealed
25	Ti-0.10Ru	Wld. pipe	SB-862	26H	R52404	Annealed
(23)	Ti-0.3Mo-0.8Ni	Plate, sheet, strip	SB-265	12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Smls. tube	SB-338	12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Wld. tube	SB-338	12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Bar, billet	SB-348	12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Smls. fittings	SB-363	WPT12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Wld. fittings	SB-363	WPT12W	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Forgings	SB-381	F-12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Smls. pipe	SB-861	12	R53400	Annealed
(23)	Ti-0.3Mo-0.8Ni	Wld. pipe	SB-862	12	R53400	Annealed
35	Ti-4Al-2.5V-1.5Fe	Plate, sheet, strip	SB-265	38	R54250	Annealed
36	Ti-4Al-2.5V-1.5Fe	Smls. tube	SB-338	38	R54250	Annealed
37	Ti-4Al-2.5V-1.5Fe	Wld. tube	SB-338	38	R54250	Annealed
38	Ti-4Al-2.5V-1.5Fe	Bar, billet	SB-348	38	R54250	Annealed
39	Ti-4Al-2.5V-1.5Fe	Smls. fittings	SB-363	WPT38	R54250	Annealed
40	Ti-4Al-2.5V-1.5Fe	Wld. fittings	SB-363	WPT38W	R54250	Annealed
41	Ti-4Al-2.5V-1.5Fe	Forgings	SB-381	F-38	R54250	Annealed
42	Ti-4Al-2.5V-1.5Fe	Smls. pipe	SB-861	38	R54250	Annealed
43	Ti-4Al-2.5V-1.5Fe	Wld. pipe	SB-862	38	R54250	Annealed
44	Ti-3Al-2.5V	Plate, sheet, strip	SB-265	9	R56320	Annealed
45	Ti-3Al-2.5V	Smls. tube	SB-338	9	R56320	Annealed

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	51	58	40	NP	NP	600	NP	NFT-2	G14, W6
2	...	51	58	40	NP	NP	600	NP	NFT-2	...
3	...	51	58	40	NP	NP	600	NP	NFT-2	...
4	...	51	58	40	NP	NP	600	NP	NFT-2	W12
5	...	51	58	40	NP	NP	600	NP	NFT-2	...
6	...	51	58	40	NP	NP	600	NP	NFT-2	...
7	...	51	58	40	NP	NP	600	NP	NFT-2	W12
8	...	51	50	40	NP	NP	600	600	NFT-2	...
9	...	51	50	40	NP	NP	600	600	NFT-2	...
10	...	51	50	40	NP	NP	600	600	NFT-2	G14, W6
11	...	51	50	40	NP	NP	600	600	NFT-2	...
12	...	51	50	40	NP	NP	600	600	NFT-2	...
13	...	51	50	40	NP	NP	600	600	NFT-2	G14
14	...	51	50	40	NP	NP	600	600	NFT-2	...
15	...	51	50	40	NP	NP	600	600	NFT-2	...
16	...	51	50	40	NP	NP	600	600	NFT-2	G14, W6
17	...	51	58	40	NP	NP	600	NP	NFT-2	...
18	...	51	58	40	NP	NP	600	NP	NFT-2	...
19	...	51	58	40	NP	NP	600	NP	NFT-2	G14, W6
20	...	51	58	40	NP	NP	600	NP	NFT-2	...
21	...	51	58	40	NP	NP	600	NP	NFT-2	...
22	...	51	58	40	NP	NP	600	NP	NFT-2	W12
23	...	51	58	40	NP	NP	600	NP	NFT-2	...
24	...	51	58	40	NP	NP	600	NP	NFT-2	...
25	...	51	58	40	NP	NP	600	NP	NFT-2	W12
26	...	52	70	50	NP	NP	600	600	NFT-5	...
27	...	52	70	50	NP	NP	600	600	NFT-5	...
28	...	52	70	50	NP	NP	600	600	NFT-5	G14, W6
29	...	52	70	50	NP	NP	600	600	NFT-5	...
30	...	52	70	50	NP	NP	600	600	NFT-5	...
31	...	52	70	50	NP	NP	600	600	NFT-5	G14
32	...	52	70	50	NP	NP	600	600	NFT-5	...
33	...	52	70	50	NP	NP	600	600	NFT-5	...
34	...	52	70	50	NP	NP	600	600	NFT-5	G14, W6
35	...	54	130	115	NP	NP	650	NP	NFT-6	...
36	...	54	130	115	NP	NP	650	NP	NFT-6	...
37	...	54	130	115	NP	NP	650	NP	NFT-6	G14, W6
38	...	54	130	115	NP	NP	650	NP	NFT-6	...
39	...	54	130	115	NP	NP	650	NP	NFT-6	...
40	...	54	130	115	NP	NP	650	NP	NFT-6	G14, W6
41	...	54	130	115	NP	NP	650	NP	NFT-6	...
42	...	54	130	115	NP	NP	650	NP	NFT-6	...
43	...	54	130	115	NP	NP	650	NP	NFT-6	G14, W6
44	...	53	90	70	NP	600	600	600	NFT-4	...
45	...	53	90	70	NP	600	600	600	NFT-4	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	14.1	13.5	12.3	11.2	10.2	9.4	8.7	8.1	7.5	6.9	6.4	...	...	...	...	...	...	...
2	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
3	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
4	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
5	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
6	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
7	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
8	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
9	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
10	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
11	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
12	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
13	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
14	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
15	14.3	13.7	12.4	11.3	10.3	9.5	8.8	8.2	7.6	7.0	6.5	...	...	...	...	...	...	...
16	12.1	11.7	10.6	9.6	8.8	8.1	7.5	7.0	6.5	6.0	5.5	...	...	...	...	...	...	...
17	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
18	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
19	14.1	13.5	12.3	11.2	10.2	9.4	8.7	8.1	7.5	6.9	6.4	...	...	...	...	...	...	...
20	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
21	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
22	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
23	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
24	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
25	16.6	15.9	14.4	13.1	12.0	11.1	10.2	9.5	8.8	8.2	7.6	...	...	...	...	...	...	...
26	20.0	20.0	18.7	17.4	16.2	15.2	14.3	13.6	13.1	12.7	12.3	...	...	...	...	...	...	...
27	20.0	20.0	18.7	17.4	16.2	15.2	14.3	13.6	13.1	12.7	12.3	...	...	...	...	...	...	...
28	17.0	17.0	15.9	14.8	13.8	12.9	12.1	11.5	11.1	10.8	10.5	...	...	...	...	...	...	...
29	20.0	20.0	18.7	17.4	16.2	15.2	14.3	13.6	13.1	12.7	12.3	...	...	...	...	...	...	...
30	20.0	20.0	18.7	17.4	16.2	15.2	14.3	13.6	13.1	12.7	12.3	...	...	...	...	...	...	...
31	17.0	17.0	15.9	14.8	13.8	12.9	12.1	11.5	11.1	10.8	10.5	...	...	...	...	...	...	...
32	20.0	20.0	18.7	17.4	16.2	15.2	14.3	13.6	13.1	12.7	12.3	...	...	...	...	...	...	...
33	20.0	20.0	18.7	17.4	16.2	15.2	14.3	13.6	13.1	12.7	12.3	...	...	...	...	...	...	...
34	17.0	17.0	15.9	14.8	13.8	12.9	12.1	11.5	11.1	10.8	10.5	...	...	...	...	...	...	...
35	37.1	37.1	36.9	35.3	33.8	32.3	31.0	29.9	29.0	28.2	27.7	27.3	...	...	...	...	...	...
36	37.1	37.1	36.9	35.3	33.8	32.3	31.0	29.9	29.0	28.2	27.7	27.3	...	...	...	...	...	...
37	31.5	31.5	31.4	30.0	28.7	27.5	26.4	25.4	24.7	24.0	23.5	23.2	...	...	...	...	...	...
38	37.1	37.1	36.9	35.3	33.8	32.3	31.0	29.9	29.0	28.2	27.7	27.3	...	...	...	...	...	...
39	37.1	37.1	36.9	35.3	33.8	32.3	31.0	29.9	29.0	28.2	27.7	27.3	...	...	...	...	...	...
40	31.5	31.5	31.4	30.0	28.7	27.5	26.4	25.4	24.7	24.0	23.5	23.2	...	...	...	...	...	...
41	37.1	37.1	36.9	35.3	33.8	32.3	31.0	29.9	29.0	28.2	27.7	27.3	...	...	...	...	...	...
42	37.1	37.1	36.9	35.3	33.8	32.3	31.0	29.9	29.0	28.2	27.7	27.3	...	...	...	...	...	...
43	31.5	31.5	31.4	30.0	28.7	27.5	26.4	25.4	24.7	24.0	23.5	23.2	...	...	...	...	...	...
44	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
45	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
1	Ti-3Al-2.5V	Wld. tube	SB-338	9	R56320	Annealed
2	Ti-3Al-2.5V	Bar, billet	SB-348	9	R56320	Annealed
3	Ti-3Al-2.5V	Smls. fittings	SB-363	WPT9	R56320	Annealed
4	Ti-3Al-2.5V	Wld. fittings	SB-363	WPT9W	R56320	Annealed
5	Ti-3Al-2.5V	Forgings	SB-381	F-9	R56320	Annealed
6	Ti-3Al-2.5V	Smls. pipe	SB-861	9	R56320	Annealed
7	Ti-3Al-2.5V	Wld. pipe	SB-862	9	R56320	Annealed
8	Ti-3Al-2.5V-0.1Ru	Plate, sheet, strip	SB-265	28	R56323	Annealed
9	Ti-3Al-2.5V-0.1Ru	Smls. tube	SB-338	28	R56323	Annealed
10	Ti-3Al-2.5V-0.1Ru	Wld. tube	SB-338	28	R56323	Annealed
11	Ti-3Al-2.5V-0.1Ru	Bar, billet	SB-348	28	R56323	Annealed
12	Ti-3Al-2.5V-0.1Ru	Smls. fittings	SB-363	WPT28	R56323	Annealed
13	Ti-3Al-2.5V-0.1Ru	Wld. fittings	SB-363	WPT28W	R56323	Annealed
14	Ti-3Al-2.5V-0.1Ru	Forgings	SB-381	F-28	R56323	Annealed
15	Ti-3Al-2.5V-0.1Ru	Smls. pipe	SB-861	28	R56323	Annealed
16	Ti-3Al-2.5V-0.1Ru	Wld. pipe	SB-862	28	R56323	Annealed
17	99.2Zr	Forgings	SB-493	...	R60702	Annealed
18	99.2Zr	Smls. tube	SB-523	...	R60702	Annealed
19	99.2Zr	Wld. tube	SB-523	...	R60702	Annealed
20	99.2Zr	Bar, wire	SB-550	...	R60702	Annealed
(23)	21 99.2Zr	Plate, sheet, strip	SB-551	...	R60702	Annealed
(23)	22 99.2Zr	Smls. fittings	SB-653	PZ-2	R60702	Annealed
(23)	23 99.2Zr	Wld. fittings	SB-653	PZ-2W	R60702	Annealed
(23)	24 99.2Zr	Smls. & wld. pipe	SB-658	...	R60702	Annealed
(23)	25 99.2Zr	Castings	SB-752	702C	R61702	...
(23)	26 95.5Zr + 2.5Nb	Forgings	SB-493	...	R60705	Annealed
(23)	27 ...	...	...	...	...	...
(23)	28 ...	...	...	...	...	...
(23)	29 95.5Zr + 2.5Nb	Bar, wire	SB-550	...	R60705	Annealed
(23)	30 95.5Zr + 2.5Nb	Plate, sheet, strip	SB-551	...	R60705	Annealed
(23)	31 95.5Zr + 2.5Nb	Smls. & wld. pipe	SB-658	...	R60705	Annealed
(23)	32 95.5Zr + 2.5Nb	Castings	SB-752	705C	R61705	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)				External Pressure Chart No.	Notes
					I	III	VIII-1	XII		
1	...	53	90	70	NP	600	600	600	NFT-4	G14, W6
2	...	53	90	70	NP	600	NP	NP	NFT-4	...
3	...	53	90	70	NP	600	NP	NP	NFT-4	...
4	...	53	90	70	NP	600	NP	NP	NFT-4	G14, W6
5	...	53	90	70	NP	600	NP	NP	NFT-4	...
6	...	53	90	70	NP	600	600	600	NFT-4	...
7	...	53	90	70	NP	600	600	600	NFT-4	G14, W6
8	...	53	90	70	NP	NP	600	NP	NFT-4	...
9	...	53	90	70	NP	NP	600	NP	NFT-4	...
10	...	53	90	70	NP	NP	600	NP	NFT-4	G14, W6
11	...	53	90	70	NP	NP	600	NP	NFT-4	...
12	...	53	90	70	NP	NP	600	NP	NFT-4	...
13	...	53	90	70	NP	NP	600	NP	NFT-4	G14, W6
14	...	53	90	70	NP	NP	600	NP	NFT-4	...
15	...	53	90	70	NP	NP	600	NP	NFT-4	...
16	...	53	90	70	NP	NP	600	NP	NFT-4	G14, W6
17	...	61	55	30	NP	400	700	NP	NFZ-1	...
18	...	61	55	30	NP	400	700	NP	NFZ-1	...
19	...	61	55	30	NP	400	700	NP	NFZ-1	G14, W6
20	...	61	55	30	NP	400	700	NP	NFZ-1	...
21	...	61	55	30	NP	NP	700	NP	NFZ-1	...
22	...	61	55	30	NP	NP	700	NP	NFZ-1	...
23	...	61	55	30	NP	NP	700	NP	NFZ-1	G14, W6
24	...	61	55	30	NP	NP	700	NP	NFZ-1	W12
25	...	61	55	40	NP	NP	600	NP	NFZ-1	G15
26	...	62	70	55	NP	NP	700	NP	NFZ-2	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	62	80	55	NP	NP	700	NP	NFZ-2	...
30	...	62	80	55	NP	NP	700	NP	NFZ-2	...
31	...	62	80	55	NP	NP	700	NP	NFZ-2	W12
32	...	62	70	50	NP	NP	600	NP	NFZ-1	G15

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950
1	21.9	21.9	21.0	20.2	19.2	18.2	17.1	16.2	15.4	14.9	14.7	...	...	...	...	...	...	...
2	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
3	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
4	21.9	21.9	21.0	20.2	19.2	18.2	17.1	16.2	15.4	14.9	14.7	...	...	...	...	...	...	...
5	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
6	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
7	21.9	21.9	21.0	20.2	19.2	18.2	17.1	16.2	15.4	14.9	14.7	...	...	...	...	...	...	...
8	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
9	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
10	21.9	21.9	21.0	20.2	19.2	18.2	17.1	16.2	15.4	14.9	14.7	...	...	...	...	...	...	...
11	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
12	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
13	21.9	21.9	21.0	20.2	19.2	18.2	17.1	16.2	15.4	14.9	14.7	...	...	...	...	...	...	...
14	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
15	25.7	25.7	24.7	23.7	22.6	21.4	20.2	19.0	18.1	17.5	17.2	...	...	...	...	...	...	...
16	21.9	21.9	21.0	20.2	19.2	18.2	17.1	16.2	15.4	14.9	14.7	...	...	...	...	...	...	...
17	15.7	15.1	13.7	12.4	11.2	10.1	9.1	8.3	7.4	6.6	6.0	5.6	5.2	...	...	...	...	...
18	15.7	15.1	13.7	12.4	11.2	10.1	9.1	8.3	7.4	6.6	6.0	5.6	5.2	...	...	...	...	...
19	13.4	12.8	11.6	10.5	9.5	8.6	7.7	7.0	6.3	5.6	5.1	4.7	4.5	...	...	...	...	...
20	15.7	15.1	13.7	12.4	11.2	10.1	9.1	8.3	7.4	6.6	6.0	5.6	5.2	...	...	...	...	...
21	15.7	15.1	13.7	12.4	11.2	10.1	9.1	8.3	7.4	6.6	6.0	5.6	5.2	...	...	...	...	...
22	15.7	15.1	13.7	12.4	11.2	10.1	9.1	8.3	7.4	6.6	6.0	5.6	5.2	...	...	...	...	...
23	13.4	12.8	11.6	10.5	9.5	8.6	7.7	7.0	6.3	5.6	5.1	4.7	4.5	...	...	...	...	...
24	15.7	15.1	13.7	12.4	11.2	10.1	9.1	8.3	7.4	6.6	6.0	5.6	5.2	...	...	...	...	...
25	15.7	15.5	14.4	13.1	11.9	10.8	9.6	8.6	7.7	6.9	6.3	...	...	...	...	...	...	...
26	20.0	18.4	16.6	15.1	13.9	13.1	12.4	12.0	11.7	11.5	11.3	11.1	10.8	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	22.9	21.0	18.9	17.3	15.9	14.9	14.2	13.7	13.4	13.1	12.5	11.9	11.4	...	...	...	...	...
30	22.9	21.0	18.9	17.3	15.9	14.9	14.2	13.7	13.4	13.1	12.5	11.9	11.4	...	...	...	...	...
31	22.9	21.0	18.9	17.3	15.9	14.9	14.2	13.7	13.4	13.1	12.5	11.9	11.4	...	...	...	...	...
32	20.0	19.9	18.5	17.2	16.0	14.8	13.6	12.6	11.7	10.9	10.2	...	...	...	...	...	...	...

Table 1B (Cont'd)
Section I; Section III, Division 1, Classes 2 and 3,* Section VIII, Division 1; and Section XII
Maximum Allowable Stress Values, S, for Nonferrous Materials
(*See Maximum Temperature Limits for Restrictions on Class)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)

NOTES TO TABLE 1B**GENERAL NOTES**

- (a) The following abbreviations are used: ann., annealed; cond., condenser; CW, cold worked; exch., exchanger; extr., extruded; fin., finished; fr., from; HW, Hot worked; rel., relieved; rld., rolled; Smls., Seamless; Sol., Solution; treat., treated; and Wld., Welded.
- (b) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (c) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (d) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.
- (e) An alternative typeface is used for stress values obtained from time-dependent properties (see Notes T1 through T19).
- (f) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SB-407/SB-407M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SB-407 Grade N08800 shall be used when SB-407M Grade N08800 is used in construction.

NOTES - GENERAL REQUIREMENTS

- G1 For steam at 250 psi (406°F), the values given for 400°F may be used.
- G2 At temperatures over 1000°F, these stress values apply only when the carbon is 0.04% or higher.
- G3 In the absence of evidence that the casting is of high quality throughout, values not in excess of 80% of those given in the Table shall be used. This is not intended to apply to valves and fittings made to recognized standards.
- G4 Creep-fatigue, thermal ratcheting, and environmental effects are increasingly significant failure modes at temperatures in excess of 1500°F and shall be considered in the design.
- G5 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed 66²/₃% but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction. For Section III applications, Table Y-2 lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give allowable stress values that will result in lower levels of permanent strain.
- G6 Maximum temperature for external pressure not to exceed 350°F.
- G7 Use 350°F curve for all temperature values below 350°F.
- G8 The stresses for this material are based on 120 ksi minimum tensile strength because of weld metal strength limitations.
- G9 Use Figure NFC-6 up to and including 300°F. Use the 600°F curve of Figure NFC-3 above 300°F up to and including 400°F. Maximum temperature for external pressure not to exceed 400°F.
- G10 Maximum temperature for external pressure not to exceed 450°F.
- G11 Referenced external pressure chart is applicable up to 700°F.
- G12 Referenced external pressure chart is applicable up to 800°F.
- G13 For Section VIII and XII applications, use of external pressure charts for material in the form of bar stock is permitted for stiffener rings only.
- G14 For Section VIII applications, a factor of 0.85 has been applied in arriving at the maximum allowable stress values in tension for this material. Divide tabulated values by 0.85 for maximum allowable longitudinal tensile stress.
- G15 To these stress values a quality factor as specified in ND-3115 of Section III; UG-24 of Section VIII, Division 1; or TM-190 of Section XII shall be applied for castings. This is not intended to apply to valves and fittings made to recognized standards.
- G16 Allowable stress values shown are 90% of those for the corresponding core material.
- (23) G17 C37700 and copper-silicon alloys are not always suitable when exposed to certain media and high temperatures, particularly steam above 212°F. The user should ensure that the alloy selected is satisfactory for the service for which it is to be used.
- G18 Because of the occasionally contingent danger from the failure of pressure vessels by stress corrosion cracking, the following is pertinent. These materials are suitable for engineering use under a wide variety of ordinary corrosive conditions with no particular hazard in respect to stress corrosion.
- G19 Few alloys are completely immune to stress corrosion cracking in all combinations of stress and corrosive environments, and the supplier of the material should be consulted. Reference may also be made to the following sources: (1) Stress Corrosion Cracking Control Measures, B. F. Brown, U.S. National Bureau of Standards (1977), available from NACE, Texas; (2) The Stress Corrosion of Metals, H. L. Logan, John Wiley & Sons, New York, 1966.
- G20 For plate only.
- G21 The maximum operating temperature is arbitrarily set at 500°F because harder temper adversely affects design stress in the creep rupture temperature range.
- G22 The minimum tensile strength of reduced section tension specimens in accordance with QW-462.1 of Section IX shall not be less than 110,000 psi.
- G23 This alloy is subject to severe loss of impact strength at room temperatures after exposure in the range of 1000°F to 1400°F.

NOTES TO TABLE 1B (CONT'D)**NOTES – GENERAL REQUIREMENTS (CONT'D)**

- G24 For stress relieved tempers (T351, T3510, T3511, T451, T4510, T4511, T651, T6510, T6511), stress values for materials in the basic temper shall be used.
- G25 The tension test specimen from plate 0.500 in. and thicker is machined from the core and does not include the cladding alloy; therefore, the allowable stress values for thickness less than 0.500 in. shall be used.
- G26 The tension test specimen from plate 0.500 in. and thicker is machined from the core and does not include the cladding alloy; therefore, the allowable stress values shown are 90% of those for the core material of the same thickness.
- G27 Alloy N06022 in the solution annealed condition is subject to severe loss of impact strength at room temperatures after exposure in the range of 1000°F to 1250°F.
- G28 For external pressure design, the maximum design temperature is limited to 1000°F.
- G29 External pressure chart NFN-2 may be used for temperatures between 400°F and 600°F.
- G30 Alloy N06025 in the solution annealed condition is subject to severe loss of rupture ductility in the approximate temperature range of 1200°F to 1400°F.
- G31 For external pressure design, the maximum design temperature is limited to 1200°F.
- G32 For Section I use, the y values (see Section I, PG-27.4.6) shall be as follows: for 1050°F and below, 0.4; for 1100°F, 0.5; and for 1150°F and above, 0.7.
- G33 Allowable stress values listed are set equal to those of an annealed temper, as data were not provided to justify higher values.
- G34 Time-dependent values are based on creep testing of as-welded product.

NOTES – HEAT TREATMENT REQUIREMENTS

- H1 For temperatures above 1000°F, these stress values may be used only if the material is annealed at a minimum temperature of 1900°F and has a carbon content of 0.04% or higher.
- H2 For temperatures above 1000°F, these stress values may be used only if the material is heat treated by heating it to a minimum temperature of 1900°F and quenching in water or rapidly cooling by other means.
- H3 For Section I applications, cold drawn pipe and tube shall be annealed at 1900°F minimum.
- H4 The material shall be given a 1725°F to 1825°F stabilizing heat treatment.

NOTES – TIME-DEPENDENT PROPERTIES [See General Note (e)]

- T1 Allowable stresses for temperatures of 250°F and above are values obtained from time-dependent properties.
- T2 Allowable stresses for temperatures of 300°F and above are values obtained from time-dependent properties.
- T3 Allowable stresses for temperatures of 350°F and above are values obtained from time-dependent properties.
- T4 Allowable stresses for temperatures of 400°F and above are values obtained from time-dependent properties.
- T5 Allowable stresses for temperatures of 500°F and above are values obtained from time-dependent properties.
- T6 Allowable stresses for temperatures of 550°F and above are values obtained from time-dependent properties.
- T7 Allowable stresses for temperatures of 600°F and above are values obtained from time-dependent properties.
- T8 Allowable stresses for temperatures of 750°F and above are values obtained from time-dependent properties.
- T9 Allowable stresses for temperatures of 800°F and above are values obtained from time-dependent properties.
- T10 Allowable stresses for temperatures of 850°F and above are values obtained from time-dependent properties.
- T11 Allowable stresses for temperatures of 900°F and above are values obtained from time-dependent properties.
- T12 Allowable stresses for temperatures of 950°F and above are values obtained from time-dependent properties.
- T13 Allowable stresses for temperatures of 1000°F and above are values obtained from time-dependent properties.
- T14 Allowable stresses for temperatures of 1050°F and above are values obtained from time-dependent properties.
- T15 Allowable stresses for temperatures of 1100°F and above are values obtained from time-dependent properties.
- T16 Allowable stresses for temperatures of 1150°F and above are values obtained from time-dependent properties.
- T17 Allowable stresses for temperatures of 1200°F and above are values obtained from time-dependent properties.
- T18 Allowable stresses for temperatures of 1250°F and above are values obtained from time-dependent properties.
- T19 Allowable stresses for temperatures of 450°F and above are values obtained from time-dependent properties.

NOTES – WELDING REQUIREMENTS

- W1 No welding or brazing permitted.
- W2 For Section VIII applications, UNF-56(d) shall apply for welded constructions.
- W3 For welded and brazed constructions, stress values for O (annealed) temper material shall be used.
- W4 The stress values given for this material are not applicable when either welding or thermal cutting is employed.
- W5 These S values do not include a longitudinal weld efficiency factor. For Section III applications, for materials welded without filler metal, ultrasonic examination, radiographic examination, or eddy current examination, in accordance with NC-2550, shall provide a longitudinal weld efficiency factor of 1.00. Materials welded with filler metal meeting the requirements of NC-2560 shall receive a longitudinal weld efficiency factor of 1.00. Other longitudinal weld efficiency factors shall be in accordance with the following:
- (a) for single butt weld, with filler metal, 0.80
 - (b) for single or double butt weld, without filler metal, 0.85
 - (c) for double butt weld, with filler metal, 0.90
 - (d) for single or double butt weld, with radiography or ultrasonic, 1.00
- W6 Filler metal shall not be used in the manufacture of welded pipe or tubing.
- W7 Strength of reduced-section tensile specimen required to qualify welding procedures. See QW-150, Section IX.
- W8 For Section VIII and XII applications, no welding is permitted.

NOTES TO TABLE 1B (CONT'D)

NOTES – WELDING REQUIREMENTS (CONT'D)

- W9 Use NFA-12 when welded with 5356 or 5556 filler metal, all thicknesses, or 4043 or 5554 filler metal, thickness $\leq \frac{3}{8}$ in. Use NFA-13 when welded with 4043 or 5554 filler metal, thickness $> \frac{3}{8}$ in.
- W10 For welded and brazed constructions, stress values for the welded and annealed (W061) temper material shall be used.
- W11 These maximum allowable stress values are to be used in welded or brazed constructions.
- W12 These S values do not include a weld factor. For Section VIII, Division 1 and Section XII applications using welds made without filler metal, the tabulated tensile stress values shall be multiplied by 0.85. For welds made with filler metal, consult UW-12 of Section VIII, Division 1, or TW-130.4 of Section XII, as applicable.
- W13 For service at 1200°F or higher, the deposited weld metal shall be of the same nominal chemistry as the base metal.
- W14 No welding permitted.

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Table 2A
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Bar, shapes	SA-675	45	...	...	...	1	1
2	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
3	Carbon steel	Wld. pipe	SA-672	A45	K01700	...	...	1	1
4	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
5	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	...	1	1
6	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
7	Carbon steel	Bar, shapes	SA-675	50	...	...	...	1	1
8	...	...	...	...	...	...	...	...	...
9	Carbon steel	Plate	SA-285	B	K02200	...	≤2	1	1
10	Carbon steel	Wld. pipe	SA-672	A50	K02200	...	...	1	1
11	Carbon steel	Bar, shapes	SA-675	55	...	...	...	1	1
12	Carbon steel	Plate	SA-285	C	K02801	...	≤2	1	1
13	Carbon steel	Wld. pipe	SA-333	1	K03008	...	...	1	1
14	Carbon steel	Smls. pipe	SA-333	1	K03008	...	...	1	1
15	Carbon steel	Wld. tube	SA-334	1	K03008	...	...	1	1
16	Carbon steel	Smls. tube	SA-334	1	K03008	...	...	1	1
17	Carbon steel	Plate	SA-516	55	K01800	...	...	1	1
18	Carbon steel	Smls. pipe	SA-524	II	K02104	...	...	1	1
19	Carbon steel	Wld. pipe	SA-671	CA55	K02801	...	...	1	1
20	Carbon steel	Wld. pipe	SA-671	CE55	K02202	...	...	1	1
21	Carbon steel	Wld. pipe	SA-672	A55	K02801	...	...	1	1
22	Carbon steel	Wld. pipe	SA-672	B55	K02001	...	...	1	1
23	Carbon steel	Wld. pipe	SA-672	C55	K01800	...	...	1	1
24	Carbon steel	Wld. pipe	SA-672	E55	K02202	...	...	1	1
25	Carbon steel	Plate, bar, shapes	SA-36	...	K02600	...	...	1	1
26	Carbon steel	Plate	SA-662	A	K01701	...	...	1	1
27	Carbon steel	Forgings	SA-181	...	K03502	60	...	1	1
28	Carbon steel	Castings	SA-216	WCA	J02502	...	...	1	1
29	Carbon steel	Forgings	SA-266	1	K03506	...	...	1	1
30	Carbon steel	Forgings	SA-350	LF1	K03009	1	...	1	1
31	Carbon steel	Castings	SA-352	LCA	J02504	...	...	1	1
32	Carbon steel	Cast pipe	SA-660	WCA	J02504	...	...	1	1
33	Carbon steel	Bar, shapes	SA-675	60	...	...	...	1	1
34	Carbon steel	Forgings	SA-765	I	K03046	...	...	1	1
35	Carbon steel	Plate	SA-515	60	K02401	...	...	1	1
36	Carbon steel	Plate	SA-516	60	K02100	...	...	1	1
37	Carbon steel	Wld. pipe	SA-671	CB60	K02401	...	...	1	1
38	Carbon steel	Wld. pipe	SA-671	CC60	K02100	...	...	1	1
39	Carbon steel	Wld. pipe	SA-671	CE60	K02402	...	...	1	1
40	Carbon steel	Wld. pipe	SA-672	B60	K02401	...	...	1	1
41	Carbon steel	Wld. pipe	SA-672	C60	K02100	...	...	1	1
42	Carbon steel	Wld. pipe	SA-672	E60	K02402	...	...	1	1
43	Carbon steel	Plate	SA-283	D	K02702	...	...	1	1
44	Carbon steel	Wld. pipe	SA-53	E/B	K03005	...	...	1	1
45	Carbon steel	Smls. pipe	SA-53	S/B	K03005	...	...	1	1

Table 2A
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	45	22.5	NP	700	CS-6	...
2	45	24	700	700	CS-1	...
3	45	24	700	NP	CS-1	G1, G4
4	48	30	700 (SPT)	NP	CS-2	E2
5	48	30	700 (SPT)	NP	CS-2	E2
6	48	30	700	700	CS-2	E2
7	50	25	700 (SPT)	700	CS-1	...
8	...	...	...	...	...	...
9	50	27	700	700	CS-1	E2
10	50	27	700	NP	CS-1	E2, G1, G4
11	55	27.5	700 (SPT)	700	CS-1	...
12	55	30	700	700	CS-2	...
13	55	30	700	NP	CS-2	...
14	55	30	700	700	CS-2	...
15	55	30	700	NP	CS-2	...
16	55	30	700	700	CS-2	...
17	55	30	700	700	CS-2	...
18	55	30	NP	700	CS-2	...
19	55	30	700	NP	CS-2	G1, G4
20	55	30	700	NP	CS-2	G1, G4
21	55	30	700	NP	CS-2	G1, G4
22	55	30	700	NP	CS-2	G1, G4
23	55	30	700	NP	CS-2	G1, G4
24	55	30	700	NP	CS-2	G1, G4
25	58	36	700 (SPT)	700	CS-2	E2
26	58	40	NP	700	CS-2	E1
27	60	30	700	700	CS-2	...
28	60	30	700	700	CS-2	...
29	60	30	700	700	CS-2	...
30	60	30	700	700	CS-2	...
31	60	30	700	NP	CS-2	...
32	60	30	700	NP	CS-2	...
33	60	30	700 (SPT)	700	CS-2	...
34	60	30	NP	700	CS-2	...
35	60	32	700	700	CS-2	...
36	60	32	700	700	CS-2	...
37	60	32	700	NP	CS-2	G1, G4
38	60	32	700	NP	CS-2	G1, G4
39	60	32	700	NP	CS-2	G1, G4
40	60	32	700	NP	CS-2	G1, G4
41	60	32	700	NP	CS-2	G1, G4
42	60	32	700	NP	CS-2	G1, G4
43	60	33	NP	700	CS-2	E2
44	60	35	700 (SPT)	NP	CS-2	E2
45	60	35	700 (SPT)	NP	CS-2	E2

Table 2A
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	15.0	14.1	13.7	...	13.3	12.8	12.2	11.5	11.1	10.7	...	...	...	...
2	15.0	...	14.7	...	14.2	13.7	13.0	12.3	11.9	11.5	...	...	...	...
3	15.0	...	14.7	...	14.2	13.7	13.0	12.3	11.9	11.5	...	...	...	...
4	16.0	...	16.0	...	16.0	16.0	16.0	15.3	14.6	14.4	...	...	...	...
5	16.0	16.0	16.0	...	16.0	16.0	16.0	15.3	14.6	14.4	...	...	...	...
6	16.0	16.0	16.0	...	16.0	16.0	16.0	15.3	14.6	14.4	...	...	...	...
7	16.7	...	15.3	...	14.7	14.2	13.6	12.8	12.4	11.9	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	16.7	16.7	16.5	...	15.9	15.4	14.7	13.8	13.3	13.0	...	...	...	...
10	16.7	16.7	16.5	...	15.9	15.4	14.7	13.8	13.3	13.0	...	...	...	...
11	18.3	...	16.8	...	16.2	15.7	14.9	14.1	13.6	13.1	...	...	...	...
12	18.3	18.3	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
13	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
14	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
15	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
16	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
17	18.3	18.3	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
18	18.3	18.3	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
19	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
20	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
21	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
22	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
23	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
24	18.3	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
25	19.3	...	19.3	...	19.3	19.3	19.3	18.4	17.8	17.3	...	...	...	...
26	19.3	19.3	19.3	...	19.3	19.3	19.3	19.3	19.3	19.2	...	...	...	...
27	20.0	18.8	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
28	20.0	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
29	20.0	18.8	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
30	20.0	18.8	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
31	20.0	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
32	20.0	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
33	20.0	...	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
34	20.0	18.8	18.3	...	17.7	17.1	16.3	15.3	14.8	14.3	...	...	...	...
35	20.0	20.0	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
36	20.0	20.0	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
37	20.0	...	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
38	20.0	...	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
39	20.0	...	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
40	20.0	...	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
41	20.0	...	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
42	20.0	...	19.5	...	18.9	18.2	17.4	16.4	15.8	15.3	...	...	...	...
43	20.0	20.0	20.0	...	19.5	18.8	17.9	16.9	16.3	15.4	...	...	...	...
44	20.0	...	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
45	20.0	...	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Smls. pipe	SA-106	B	K03006	...	...	1	1
2	Carbon steel	Fittings	SA-234	WPB	K03006	...	...	1	1
3	Carbon steel	Wld. fittings	SA-234	WPB	K03006	W	...	1	1
4	Carbon steel	Wld. pipe	SA-333	6	K03006	...	...	1	1
5	Carbon steel	Smls. pipe	SA-333	6	K03006	...	...	1	1
6	Carbon steel	Smls. & wld. tube	SA-334	6	K03006	...	...	1	1
7	Carbon steel	Forgings	SA-372	A	K03002	...	...	1	1
8	Carbon steel	Fittings	SA-420	WPL6	...	...	...	1	1
9	Carbon steel	Wld. fittings	SA-420	WPL6	...	WP-W	...	1	1
10	Carbon steel	Smls. pipe	SA-524	I	K02104	...	...	1	1
11	Carbon steel	Bar	SA-696	B	K03200	...	...	1	1
12	Carbon steel	Forgings	SA-727	...	K02506	...	...	1	1
13	Carbon steel	Wld. tube	SA-178	C	K03503	...	...	1	1
14	Carbon steel	Wld. tube	SA-178	C	K03503	...	...	1	1
15	Carbon steel	Smls. tube	SA-210	A-1	K02707	...	...	1	1
16	Carbon steel	Bar, shapes	SA-675	65	...	...	...	1	1
17	Carbon steel	Castings	SA-352	LCB	J03003	...	...	1	1
18	Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
19	Carbon steel	Plate	SA-516	65	K02403	...	...	1	1
20	Carbon steel	Wld. pipe	SA-671	CB65	K02800	...	...	1	1
21	Carbon steel	Wld. pipe	SA-671	CC65	K02403	...	...	1	1
22	Carbon steel	Wld. pipe	SA-672	B65	K02800	...	...	1	1
23	Carbon steel	Wld. pipe	SA-672	C65	K02403	...	...	1	1
24	Carbon steel	Plate	SA-662	B	K02203	...	...	1	1
25	Carbon steel	Plate	SA-537	...	K12437	1	$2\frac{1}{2} < t \leq 4$	1	2
26	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$2\frac{1}{2} < t \leq 4$	1	2
(23) 27	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	NT or QT	$1.4 < t \leq 6.3$	1	2
(23) 28	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	Normalized	$t \leq 1.4$	1	1
(23) 29	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$6 < t \leq 10$	1	2
(23) 30	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$4 < t \leq 6$	1	2
31	Carbon steel	Bar, shapes	SA-675	70	...	...	...	1	1
32	Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2
33	Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2
34	Carbon steel	Castings	SA-216	WCB	J03002	...	...	1	2
35	Carbon steel	Forgings	SA-266	2	K03506	...	...	1	2
36	Carbon steel	Forgings	SA-266	4	K03017	...	...	1	2
37	Carbon steel	Forgings	SA-350	LF2	K03011	...	...	1	2
38	Carbon steel	Forgings	SA-508	1	K13502	...	...	1	2
39	Carbon steel	Forgings	SA-508	1A	K13502	...	...	1	2
40	Carbon steel	Forgings	SA-541	1	K03506	...	...	1	2
41	Carbon steel	Forgings	SA-541	1A	K03020	...	...	1	2
42	Carbon steel	Cast pipe	SA-660	WCB	J03003	...	...	1	2
43	Carbon steel	Forgings	SA-765	II	K03047	...	...	1	2
44	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2
45	Carbon steel	Plate	SA-516	70	K02700	...	...	1	2

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	60	35	700	700	CS-2	E2
2	60	35	700	700	CS-2	E2
3	60	35	700	NP	CS-2	E2
4	60	35	700	NP	CS-2	E2
5	60	35	700	700	CS-2	E2
6	60	35	700	NP	CS-2	E2
7	60	35	NP	650	CS-2	G19, H5
8	60	35	700	700	CS-2	E2
9	60	35	700	NP	CS-2	E2
10	60	35	NP	700	CS-2	E2
11	60	35	700	NP	CS-2	E2
12	60	36	700 (SPT)	700	CS-2	E2
13	60	37	700	NP	CS-2	E2
14	60	37	NP	700	CS-2	E2, G18
15	60	37	700	700	CS-2	E2
16	65	32.5	NP	700	CS-2	...
17	65	35	700	700	CS-2	...
18	65	35	700	700	CS-2	...
19	65	35	700	700	CS-2	...
20	65	35	700	NP	CS-2	G1, G4
21	65	35	700	NP	CS-2	G1, G4
22	65	35	700	NP	CS-2	G1, G4
23	65	35	700	NP	CS-2	G1, G4
24	65	40	NP	700	CS-2	E2
25	65	45	700	700	CS-2	E2
26	65	45	700	NP	CS-2	E2, G1, G2
27	66.5	37	NP	700	CS-2	E2
28	66.5	40.5	NP	700	CS-2	E2
29	68	40.5	NP	700	CS-2	E2
30	69.5	43	NP	700	CS-2	E2
31	70	35	NP	700	CS-2	...
32	70	36	700	700	CS-2	...
33	70	36	700	700	CS-2	...
34	70	36	700	700	CS-2	...
35	70	36	700	700	CS-2	...
36	70	36	NP	700	CS-2	...
37	70	36	700	700	CS-2	...
38	70	36	700	700	CS-2	...
39	70	36	700	700	CS-2	...
40	70	36	700	700	CS-2	...
41	70	36	700	700	CS-2	...
42	70	36	700	NP	CS-2	...
43	70	36	NP	700	CS-2	...
44	70	38	700	700	CS-2	...
45	70	38	700	700	CS-2	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
2	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
3	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
4	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
5	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
6	20.0	...	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
7	20.0	20.0	20.0	20.0	20.0	19.9	19.0	17.9	17.3	...	...	...	...	...
8	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
9	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
10	20.0	20.0	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
11	20.0	...	20.0	...	20.0	19.9	19.0	17.9	17.3	16.8	...	...	...	...
12	20.0	20.0	20.0	...	20.0	20.0	19.6	18.4	17.8	17.3	...	...	...	...
13	20.0	...	20.0	...	20.0	20.0	20.0	18.9	18.3	17.8	...	...	...	...
14	17.0	...	17.0	...	17.0	17.0	17.0	16.1	15.5	15.1	...	...	...	...
15	20.0	20.0	20.0	...	20.0	20.0	20.0	18.9	18.3	17.8	...	...	...	...
16	21.7	20.4	19.8	19.5	19.2	18.5	17.7	16.6	16.1	15.5	...	...	...	...
17	21.7	21.7	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
18	21.7	21.7	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
19	21.7	21.7	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
20	21.7	...	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
21	21.7	...	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
22	21.7	...	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
23	21.7	...	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
24	21.7	21.7	21.7	...	21.7	21.7	21.7	20.4	19.8	19.2	...	...	...	...
25	21.7	...	21.7	...	21.7	21.7	21.7	21.7	20.5	19.6	...	...	...	...
26	21.7	...	21.7	...	21.7	21.7	21.7	21.7	20.5	19.6	...	...	...	...
27	22.2	22.2	22.2	21.9	21.7	20.9	19.9	18.8	18.1	17.5	14.8	12.0	9.3	6.7 (23)
28	22.2	22.2	22.2	22.2	22.2	22.2	21.9	20.6	19.9	19.3	14.8	12.0	9.3	6.7 (23)
29	22.7	22.7	22.7	22.7	22.7	22.7	22.1	20.7	20.1	18.3	14.8	12.0	9.3	6.7 (23)
30	23.2	23.2	23.2	23.2	23.2	23.2	23.2	21.9	21.1	18.3	14.8	12.0	9.3	6.7 (23)
31	23.3	21.9	21.4	...	20.6	19.9	19.0	17.9	17.3	16.7	...	...	...	...
32	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
33	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
34	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
35	23.3	...	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
36	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
37	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
38	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
39	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
40	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
41	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
42	23.3	...	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
43	23.3	22.6	22.0	...	21.2	20.5	19.6	18.4	17.8	17.2	...	...	...	...
44	23.3	23.3	23.2	...	22.4	21.6	20.6	19.4	18.8	18.1	...	...	...	...
45	23.3	23.3	23.2	...	22.4	21.6	20.6	19.4	18.8	18.1	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Wld. pipe	SA-671	CB70	K03101	...	...	1	2
2	Carbon steel	Wld. pipe	SA-671	CC70	K02700	...	...	1	2
3	Carbon steel	Wld. pipe	SA-672	B70	K03101	...	...	1	2
4	Carbon steel	Wld. pipe	SA-672	C70	K02700	...	...	1	2
5	Carbon steel	Smls. pipe	SA-106	C	K03501	...	...	1	2
6	Carbon steel	Smls. tube	SA-210	C	K03501	...	...	1	2
7	Carbon steel	Castings	SA-216	WCC	K02503	...	...	1	2
8	Carbon steel	Fittings	SA-234	WPC	K03501	...	...	1	2
9	Carbon steel	Wld. fittings	SA-234	WPC	K03501	W	...	1	2
10	Carbon steel	Castings	SA-352	LCC	J02505	...	...	1	2
11	Carbon steel	Castings	SA-487	16	...	A	...	1	2
12	Carbon steel	Plate	SA-537	...	K12437	3	$4 < t \leq 6$	1	3
13	Carbon steel	Cast pipe	SA-660	WCC	J02505	...	...	1	2
14	Carbon steel	Bar	SA-696	C	K03200	...	...	1	2
15	Carbon steel	Plate	SA-662	C	K02007	...	...	1	2
16	Carbon steel	Plate	SA-537	...	K12437	2	$4 < t \leq 6$	1	3
17	Carbon steel	Plate	SA-738	C	...	...	$4 < t \leq 6$	1	3
18	Carbon steel	Plate	SA-537	...	K12437	1	$\leq 2\frac{1}{2}$	1	2
19	Carbon steel	Wld. pipe	SA-671	CD70	K12437	...	$\leq 2\frac{1}{2}$	1	2
20	Carbon steel	Wld. pipe	SA-672	D70	K12437	...	$\leq 2\frac{1}{2}$	1	2
21	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$\leq 2\frac{1}{2}$	1	2
(23) 22	Carbon steel	Plate	SA-841	A	...	1	$t \leq 4$	1	2
(23) 23	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	NT	$1.4 < t \leq 6.3$	1	2
(23) 24	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	Normalized	$t \leq 1.4$	1	2
(23) 25	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$2.5 < t \leq 4$	1	2
(23) 26	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	QT	$t \leq 2.8$	1	2
(23) 27	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$1.5 < t \leq 2.5$	1	2
(23) 28	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$\frac{5}{8} < t \leq 1.5$	1	2
(23) 29	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$\leq \frac{5}{8}$	1	2
(23) 30	Carbon steel	Forgings	SA-266	3	K05001	...	...	1	2
31	Carbon steel	Plate	SA-299	A	K02803	...	>1	1	2
32	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	>1	1	2
33	Carbon steel	Plate	SA-299	A	K02803	...	≤ 1	1	2
34	Carbon steel	Wld. pipe	SA-671	CK75	K02803	...	≤ 1	1	2
35	Carbon steel	Wld. pipe	SA-672	N75	K02803	...	≤ 1	1	2
36	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	≤ 1	1	2
37	Carbon steel	Forgings	SA-372	B	K04001	...	...	1	2
38	Carbon steel	Plate	SA-738	A	K12447	N	$\leq 2\frac{1}{2}$	1	2
39	Carbon steel	Plate	SA-738	A	K12447	QT	...	1	2
40	Carbon steel	Plate	SA-537	...	K12437	3	$2\frac{1}{2} < t \leq 4$	1	3
41	Carbon steel	Plate	SA-537	...	K12437	2	$2\frac{1}{2} < t \leq 4$	1	3
42	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437	...	$2\frac{1}{2} < t \leq 4$	1	3
(23) 43	Carbon steel	Plate	SA-738	C	...	...	$2\frac{1}{2} < t \leq 4$	1	3
(23) 44	Carbon steel	Plate	SA-299	B	K02803	...	$t > 1$	1	3
(23) 45	Carbon steel	Plate	SA-299	B	K02803	...	$t \leq 1$	1	3

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	70	38	700	NP	CS-2	G1, G3
2	70	38	700	NP	CS-2	G1, G4
3	70	38	700	NP	CS-2	G1, G3
4	70	38	700	NP	CS-2	G1, G4
5	70	40	700	700	CS-2	E2
6	70	40	NP	700	CS-2	E2
7	70	40	700	700	CS-2	E2
8	70	40	700	700	CS-2	E2
9	70	40	700	NP	CS-2	E2
10	70	40	700	NP	CS-2	E2
11	70	40	700	NP	CS-2	E2
12	70	40	NP	700	CS-2	E2
13	70	40	700	NP	CS-2	E2
14	70	40	700	NP	CS-2	E2
15	70	43	NP	700	CS-3	E2
16	70	46	700	700	CS-3	E2
17	70	46	NP	650	CS-3	...
18	70	50	700	700	CS-3	E2
19	70	50	700	NP	CS-3	E2, G1, G4
20	70	50	700	NP	CS-3	E2, G1, G4
21	70	50	700	NP	CS-3	E2, G1, G4
22	70	50	NP	650	CS-3	E2
23	71	40.5	NP	700	CS-2	E2
24	71	44	NP	700	CS-2	E2
25	71	45.5	NP	700	CS-2	E2
26	74	41.5	NP	700	CS-2	E2
27	74	48.5	NP	700	CS-2	E2
28	74	50	NP	700	CS-2	E2
29	74	51.5	NP	700	CS-2	E2
30	75	37.5	700	700	CS-2	W6
31	75	40	700	700	CS-2	...
32	75	40	700	NP	CS-2	G1, G4
33	75	42	700	700	CS-2	E2
34	75	42	700	NP	CS-2	E2, G1
35	75	42	700	NP	CS-2	E2, G1
36	75	42	700	NP	CS-2	E2, G1
37	75	45	NP	100	CS-3	G19, H5, W5, W6
38	75	45	NP	700	CS-2	...
39	75	45	NP	700	CS-2	...
40	75	50	NP	700	CS-5	E2
41	75	55	700	700	CS-5	E2
42	75	55	700	NP	CS-5	E2
43	75	55	NP	650	CS-5	...
44	80	45	...	700	CS-3	E2
45	80	47	...	700	CS-3	E2

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	23.3	...	23.2	...	22.4	21.6	20.6	19.4	18.8	18.1	...	...	...	...
2	23.3	...	23.2	...	22.4	21.6	20.6	19.4	18.8	18.1	...	...	...	...
3	23.3	...	23.2	...	22.4	21.6	20.6	19.4	18.8	18.1	...	...	...	...
4	23.3	...	23.2	...	22.4	21.6	20.6	19.4	18.8	18.1	...	...	...	...
5	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
6	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
7	23.3	23.3	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
8	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
9	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
10	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
11	23.3	...	23.2	...	21.9	21.1	20.4	19.6	19.1	18.6	...	...	...	...
12	23.3	23.3	23.3	...	23.2	22.2	21.3	20.6	20.2	19.8	...	...	...	...
13	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
14	23.3	...	23.3	...	23.3	22.8	21.7	20.4	19.8	19.2	...	...	...	...
15	23.3	...	23.3	...	23.3	23.3	23.3	22.0	21.2	20.7	...	...	...	...
16	23.3	...	23.3	...	23.3	23.3	23.3	23.1	22.5	20.7	...	...	...	...
17	23.3	...	23.3	...	23.3	23.3	23.3	23.1	22.5	...	...	...	...	...
18	23.3	...	23.3	...	22.8	22.7	22.7	22.4	21.9	21.4	...	...	...	...
19	23.3	...	23.3	...	22.8	22.7	22.7	22.4	21.9	21.4	...	...	...	...
20	23.3	...	23.3	...	22.8	22.7	22.7	22.4	21.9	21.4	...	...	...	...
21	23.3	...	23.3	...	22.8	22.7	22.7	22.4	21.9	21.4	...	...	...	...
22	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	22.8	...	...	...	...	(23)
23	23.7	23.7	23.7	23.7	23.7	22.9	21.9	20.6	19.9	19.3	14.8	12.0	9.3	6.7 (23)
24	23.7	23.7	23.7	23.7	23.7	23.7	23.7	22.5	21.7	20.9	14.8	12.0	9.3	6.7 (23)
25	23.7	23.7	23.7	23.7	23.7	23.7	23.7	22.5	21.7	18.3	14.8	12.0	9.3	6.7 (23)
26	24.7	24.7	24.7	24.4	24.2	23.4	22.3	21.0	20.3	19.6	14.8	12.0	9.3	6.7 (23)
27	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.0	18.3	14.8	12.0	9.3	6.7 (23)
28	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.0	18.3	14.8	12.0	9.3	6.7 (23)
29	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	18.3	14.8	12.0	9.3	6.7 (23)
30	25.0	23.5	22.9	...	22.1	21.4	20.4	19.2	18.5	17.9	...	...	...	(23)
31	25.0	25.0	24.4	...	23.6	22.8	21.7	20.4	19.8	19.1	...	...	...	...
32	25.0	...	24.4	...	23.6	22.8	21.7	20.4	19.8	19.1	...	...	...	...
33	25.0	25.0	25.0	...	24.8	23.9	22.8	21.5	20.8	20.2	...	...	...	...
34	25.0	25.0	25.0	...	24.8	23.9	22.8	21.5	20.8	20.2	...	...	...	...
35	25.0	25.0	25.0	...	24.8	23.9	22.8	21.5	20.8	20.2	...	...	...	...
36	25.0	...	25.0	...	24.8	23.9	22.8	21.5	20.8	20.2	...	...	...	...
37	25.0	...	...	...	...	...	...	...	...	...	...	...	...	...
38	25.0	...	25.0	...	24.3	22.6	21.2	20.2	19.7	19.3	...	...	...	...
39	25.0	...	25.0	...	25.0	25.0	24.0	23.1	22.7	22.3	...	...	...	...
40	25.0	...	25.0	...	25.0	25.0	25.0	24.8	22.5	21.4	...	...	...	...
41	25.0	...	25.0	...	25.0	25.0	25.0	24.8	24.4	24.3	...	...	...	...
42	25.0	...	25.0	...	25.0	25.0	25.0	24.8	24.4	24.3	...	...	...	...
43	25.0	...	25.0	...	25.0	25.0	25.0	24.8	24.4	...	...	...	...	...
44	26.7	26.7	26.7	26.6	26.5	25.6	24.5	23.0	22.3	19.6	15.7	12.6	9.3	6.7 (23)
45	26.7	26.7	26.7	26.6	26.5	25.6	24.5	23.0	22.3	19.6	15.7	12.6	9.3	6.7 (23)

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Forgings	SA-765	IV	K02009	...	...	1	3
2	Carbon steel	Plate	SA-537	...	K12437	3	$\leq 2\frac{1}{2}$	1	3
3	Carbon steel	Plate	SA-537	...	K12437	2	$\leq 2\frac{1}{2}$	1	3
4	Carbon steel	Wld. pipe	SA-671	CD80	K12437	...	$\leq 2\frac{1}{2}$	1	3
5	Carbon steel	Wld. pipe	SA-672	D80	K12437	...	$\leq 2\frac{1}{2}$	1	3
6	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437	...	$\leq 2\frac{1}{2}$	1	3
7	Carbon steel	Plate	SA-738	C	...	...	$\leq 2\frac{1}{2}$	1	3
(23) 8	Carbon steel	Plate	SA-841	B	...	2	$t \leq 4$	1	3
9	Carbon steel	Plate	SA-612	...	K02900	N	$\frac{1}{2} < t \leq 1$	10C	1
10	Carbon steel	Plate	SA-612	...	K02900	N	$\leq \frac{1}{2}$	10C	1
(23) 11	Carbon steel	Plate	SA-738	B	K12007	...	...	1	3
12	Carbon steel	Forgings	SA-372	C	K04801	...	...	...	...
13	Carbon steel	Plate	SA-724	A	K11831	...	...	1	4
14	Carbon steel	Plate	SA-724	C	K12037	...	...	1	4
15	Carbon steel	Plate	SA-724	B	K12031	...	...	1	4
16	Ductile cast iron	Castings	SA-874	...	...	...	$12 < t < 21$	...	...
17	Ductile cast iron	Castings	SA/JIS G5504	FCD 300 LT	...	...	$12 < t < 21$	...	...
18	C-Mn-Si-Cb	Plate	SA-737	B	K12001	...	...	1	2
19	C-Mn-Si-V	Plate	SA-737	C	K12202	...	...	1	3
20	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1b	K11422	...	...	3	1
21	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1	K11522	...	...	3	1
22	C- $\frac{1}{2}$ Mo	Fittings	SA-234	WP1	K12821	...	...	3	1
23	C- $\frac{1}{2}$ Mo	Wld. fittings	SA-234	WP1	K12821	W	...	3	1
24	C- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P1	K11522	...	...	3	1
25	C- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP1	K11522	...	...	3	1
26	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1a	K12023	...	...	3	1
27	C- $\frac{1}{2}$ Mo	Castings	SA-217	WC1	J12524	...	...	3	1
28	C- $\frac{1}{2}$ Mo	Castings	SA-352	LC1	J12522	...	...	3	1
29	C- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP1	J12521	...	...	3	1
30	C- $\frac{1}{2}$ Mo	Plate	SA-204	A	K11820	...	...	3	1
31	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L65	K11820	...	...	3	1
32	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-65	K11820	...	...	3	1
33	C- $\frac{1}{2}$ Mo	Forgings	SA-182	F1	K12822	...	...	3	2
34	C- $\frac{1}{2}$ Mo	Plate	SA-204	B	K12020	...	...	3	2
35	C- $\frac{1}{2}$ Mo	Forgings	SA-336	F1	K12520	...	...	3	2
36	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L70	K12020	...	...	3	2
37	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-70	K12020	...	...	3	2
38	C- $\frac{1}{2}$ Mo	Plate	SA-204	C	K12320	...	...	3	2
39	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L75	K12320	...	...	3	2
40	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-75	K12320	...	...	3	2
41	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	70	...	...	...
42	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	70	...	...	...
43	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo-V	Plate	SA-517	B	K11630	...	$\leq 1\frac{1}{4}$	11B	4
44	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Forgings	SA-592	A	K11856	...	$2\frac{1}{2} < t \leq 4$	11B	1
45	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Plate	SA-517	A	K11856	...	$\leq 1\frac{1}{4}$	11B	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	80	50	NP	700	CS-3	...
2	80	55	NP	700	CS-5	E1
3	80	60	700	700	CS-5	E1
4	80	60	700	NP	CS-5	E1, G1, G4
5	80	60	700	NP	CS-5	E1, G1, G4
6	80	60	700	NP	CS-5	E1, G1, G4
7	80	60	NP	650	CS-5	E1
8	80	60	NP	650	CS-3	...
9	81	50	NP	650	CS-3	...
10	83	50	NP	650	CS-3	...
11	85	60	650	600	CS-5	...
12	90	55	NP	100	CS-3	G19, H5, W5, W6
13	90	70	NP	700	CS-5	E1
14	90	70	NP	700	CS-5	E1
15	95	75	NP	700	CS-5	E1
16	43.5	29	650	NP	CD-2	G17, W1
17	43.5	29	650	NP	CD-2	G17, W1
18	70	50	700	700	CS-3	E2
19	80	60	700	700	CS-3	E1
20	53	28	NP	700	CS-1	...
21	55	30	NP	700	CS-2	...
22	55	30	700	700	CS-2	...
23	55	30	700	NP	CS-2	...
24	55	30	700	700	CS-2	...
25	55	30	700	700	CS-2	...
26	60	32	NP	700	CS-2	...
27	65	35	700	700	CS-2	...
28	65	35	700	700	CS-2	...
29	65	35	700	NP	CS-2	...
30	65	37	700	700	CS-2	...
31	65	37	700	NP	CS-2	G1, G2
32	65	37	700	NP	CS-2	G1, G2
33	70	40	700	700	CS-2	...
34	70	40	700	700	CS-2	...
35	70	40	700	700	CS-2	...
36	70	40	700	NP	CS-2	G1, G2
37	70	40	700	NP	CS-2	G1, G2
38	75	43	700	700	CS-2	...
39	75	43	700	NP	CS-2	G1, G2
40	75	43	700	NP	CS-2	G1, G2
41	120	70	NP	100	CS-3	G19, H4, W5, W6
42	120	70	NP	100	CS-3	G19, H4, W5, W6
43	115	100	700 (SPT)	700	HT-1	...
44	105	90	700 (SPT)	NP	CS-5	...
45	115	100	700 (SPT)	700	HT-1	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	26.7	...	26.7	...	26.7	26.4	26.4	25.5	25.1	24.7	...	...	...	...
2	26.7	...	26.7	...	26.7	26.7	26.7	26.4	26.0	24.3	...	...	...	...
3	26.7	...	26.7	...	26.7	26.7	26.7	26.4	26.0	24.3	...	...	...	...
4	26.7	...	26.7	...	26.7	26.7	26.7	26.4	26.0	24.3	...	...	...	...
5	26.7	...	26.7	...	26.7	26.7	26.7	26.4	26.0	24.3	...	...	...	...
6	26.7	...	26.7	...	26.7	26.7	26.7	26.4	26.0	24.3	...	...	...	...
7	26.7	...	26.7	...	26.7	26.7	26.7	26.4	26.0	...	...	...	...	...
8	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.6	26.1	...	...	...	...	...
9	27.0	...	27.0	...	26.5	25.0	23.5	22.6	22.0	...	...	...	...	...
10	27.7	...	27.7	...	27.1	25.0	23.5	22.6	22.0	...	...	...	...	...
11	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.1	27.7	...	...	...	...	...
12	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	26.2	25.9	...	...	...	...
14	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	26.2	25.9	...	...	...	...
15	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.4	26.2	25.9	...	...	...	...
16	10.9	...	10.8	...	10.3	10.0	9.8	9.6	9.4	...	...	...	...	...
17	10.9	...	10.8	...	10.3	10.0	9.8	9.6	9.4	...	...	...	...	...
18	23.3	23.3	23.3	...	23.3	23.3	23.3	22.6	22.3	22.1	...	...	...	...
19	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.2	25.9	...	...	...	...
20	17.7	...	17.5	...	16.8	16.3	15.8	15.3	15.0	14.7	...	...	...	...
21	18.3	...	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
22	18.3	18.3	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
23	18.3	18.3	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
24	18.3	...	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
25	18.3	...	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
26	20.0	...	20.0	...	19.2	18.6	18.0	17.4	17.1	16.8	...	...	...	...
27	21.7	...	21.7	...	21.0	20.3	19.7	19.1	18.7	18.4	...	...	...	...
28	21.7	...	21.7	...	21.0	20.3	19.7	19.1	18.7	18.4	...	...	...	...
29	21.7	...	21.7	...	21.0	20.3	19.7	19.1	18.7	18.4	...	...	...	...
30	21.7	...	21.7	...	21.7	21.5	20.8	20.2	19.8	19.4	...	...	...	...
31	21.7	...	21.7	...	21.7	21.5	20.8	20.2	19.8	19.4	...	...	...	...
32	21.7	...	21.7	...	21.7	21.5	20.8	20.2	19.8	19.4	...	...	...	...
33	23.3	...	23.3	...	23.3	23.2	22.5	21.8	21.4	21.0	...	...	...	...
34	23.3	...	23.3	...	23.3	23.2	22.5	21.8	21.4	21.0	...	...	...	...
35	23.3	...	23.3	...	23.3	23.2	22.5	21.8	21.4	21.0	...	...	...	...
36	23.3	...	23.3	...	23.3	23.2	22.5	21.8	21.4	21.0	...	...	...	...
37	23.3	...	23.3	...	23.3	23.2	22.5	21.8	21.4	21.0	...	...	...	...
38	25.0	...	25.0	...	25.0	25.0	24.2	23.4	23.0	22.6	...	...	...	...
39	25.0	...	25.0	...	25.0	25.0	24.2	23.4	23.0	22.6	...	...	...	...
40	25.0	...	25.0	...	25.0	25.0	24.2	23.4	23.0	22.6	...	...	...	...
41	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
42	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
43	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	37.5	...	...	...	...
44	35.0	...	35.0	...	35.0	35.0	35.0	34.8	34.0	33.2	...	...	...	...
45	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	37.5	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design/ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	$\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{Si}$	Forgings	SA-592	A	K11856	...	$\leq 2\frac{1}{2}$	11B	1
2	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Smls. pipe	SA-335	P2	K11547	...	...	3	1
3	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Forged pipe	SA-369	FP2	K11547	...	...	3	1
4	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-387	2	K12143	1	...	3	1
5	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Wld. pipe	SA-691	$\frac{1}{2}\text{CR}$	K12143	...	...	3	1
6	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Smls. tube	SA-213	T2	K11547	...	...	3	1
7	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Cast pipe	SA-426	CP2	J11547	...	...	3	1
8	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA-182	F2	K12122	...	...	3	2
9	$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-387	2	K12143	2/NT	...	3	2
10	$\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Ni}-\text{Cu}$	Smls. tube	SA-423	1	K11535	...	...	4	2
11	$\frac{3}{4}\text{Cr}-\frac{3}{4}\text{Ni}-\text{Cu}-\text{Al}$	Smls. pipe	SA-333	4	K11267	...	...	4	2
(23) 12	$1\text{Cr}-\frac{1}{5}\text{Mo}$	Forgings	SA-372	E	K13047	70	...	...	...
13	$1\text{Cr}-\frac{1}{5}\text{Mo}$	Forgings	SA-372	F	G41350	70	...	...	...
14	$1\text{Cr}-\frac{1}{5}\text{Mo}$	Forgings	SA-372	J	K13548	70	...	...	...
15	$1\text{Cr}-\frac{1}{5}\text{Mo}$	Forgings	SA-372	J	G41370	110	...	...	...
16	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-387	12	K11757	1	...	4	1
17	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Wld. pipe	SA-691	1CR	K11757	22	...	4	1
18	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Cast pipe	SA-426	CP12	J11562	...	...	4	1
19	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA-182	F12	K11562	1	...	4	1
20	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Smls. tube	SA-213	T12	K11562	...	...	4	1
21	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Fittings	SA-234	WP12	K12062	1	...	4	1
22	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Smls. pipe	SA-335	P12	K11562	...	...	4	1
23	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forged pipe	SA-369	FP12	K11562	...	...	4	1
(23) 24	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$10 < t \leq 20$	4	1
(23) 25	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$6 < t \leq 10$	4	1
(23) 26	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$4 < t \leq 6$	4	1
(23) 27	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$4 < t \leq 10$	4	1
(23) 28	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$2.5 < t \leq 4$	4	1
(23) 29	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$2.8 < t \leq 4$	4	1
(23) 30	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT	$1.4 < t \leq 2.8$	4	1
(23) 31	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT	$t \leq 1.4$	4	1
(23) 32	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$\frac{5}{8} < t \leq 2.5$	4	1
(23) 33	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$t \leq \frac{5}{8}$	4	1
34	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-387	12	K11757	2	...	4	1
35	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Wld. pipe	SA-691	1CR	K11757	42/NT	...	4	1
36	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA-182	F12	K11564	2	...	4	1
37	$1\text{Cr}-\frac{1}{2}\text{Mo}$	Forgings	SA-336	F12	K11564	...	...	4	1
38	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	Castings	SA-217	WC6	J12072	...	...	4	1
39	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	Cast pipe	SA-426	CP11	J12072	...	...	4	1
40	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	Bar	SA-739	B11	K11797	...	...	4	1
41	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Forgings	SA-182	F11	K11597	1	...	4	1
42	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Smls. tube	SA-213	T11	K11597	...	...	4	1
43	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Fittings	SA-234	WP11	...	1	...	4	1
44	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Wld. fittings	SA-234	WP11	...	1/W	...	4	1
45	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Smls. pipe	SA-335	P11	K11597	...	...	4	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	115	100	NP	700	HT-1	...
2	55	30	700	700	CS-2	...
3	55	30	700	700	CS-2	...
4	55	33	700	700	CS-2	...
5	55	33	700	NP	CS-2	G1, G2
6	60	30	700	700	CS-2	...
7	60	30	700	NP	CS-2	...
8	70	40	NP	700	CS-2	...
9	70	45	NP	100	CS-3	...
10	60	37	NP	700	CS-2	...
11	60	35	NP	100	CS-2	...
12	120	70	NP	650	CS-5	G19, H4, W5, W6
13	120	70	NP	650	CS-5	G19, H4, W5, W6
14	120	70	NP	650	CS-5	G19, H4, W5, W6
15	135	110	NP	650	HT-1	H4, W5, W6
16	55	33	700	900	CS-2	...
17	55	33	700	NP	CS-2	G15
18	60	30	700	NP	CS-2	...
19	60	32	NP	900	CS-2	...
20	60	32	700	900	CS-2	...
21	60	32	700	900	CS-2	...
22	60	32	700	900	CS-2	...
23	60	32	700	900	CS-2	...
24	61	35	NP	900	CS-2	E4
25	61	35.5	NP	900	CS-2	E4
26	62.5	37	NP	900	CS-2	E4
27	64	38.5	NP	900	CS-2	E4
28	64	39	NP	900	CS-2	E4
29	64	40	NP	900	CS-2	E4
30	64	41.5	NP	900	CS-2	E4
31	64	43	NP	900	CS-2	E4
32	65.5	42	NP	900	CS-2	E4
33	65.5	43.5	NP	900	CS-2	E4
34	65	40	700	900	CS-2	E4
35	65	40	700	NP	CS-2	G16
36	70	40	700	900	CS-2	E4
37	70	40	700	900	CS-2	E4
38	70	40	700	900	CS-2	E4
39	70	40	700	NP	CS-2	...
40	70	45	700	900	CS-3	E4
41	60	30	NP	900	CS-2	...
42	60	30	700	900	CS-2	...
43	60	30	700	900	CS-2	...
44	60	30	700	NP	CS-2	...
45	60	30	700	900	CS-2	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	37.5	...	...	...	...
2	18.3	...	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
3	18.3	...	18.3	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
4	18.3	...	18.3	...	18.3	18.3	18.3	18.0	17.7	17.3	...	...	...	...
5	18.3	...	18.3	...	18.3	18.3	18.3	18.0	17.7	17.3	...	...	...	...
6	20.0	...	18.8	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
7	20.0	...	18.8	...	18.0	17.4	16.9	16.4	16.1	15.7	...	...	...	...
8	23.3	...	23.3	...	23.3	23.2	22.5	21.8	21.4	21.0	...	...	...	...
9	23.3	...	...	...	...	...	...	...	...	...	...	...	...	...
10	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
11	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	40.0	40.0	40.0	...	40.0	40.0	39.4	37.9	36.9	...	...	...	...	...
13	40.0	...	40.0	...	40.0	40.0	39.4	37.9	36.9	...	...	...	...	...
14	40.0	...	40.0	...	40.0	40.0	39.4	37.9	36.9	...	...	...	...	...
15	44.9	...	43.1	...	42.8	42.5	42.1	41.9	40.0	...	...	...	...	...
16	18.3	...	18.0	...	17.6	17.6	17.2	16.8	16.5	16.3	16.0	15.7	15.4	15.0
17	18.3	...	18.0	...	17.6	17.6	17.2	16.8	16.5	16.3	...	...	...	...
18	20.0	...	18.1	...	17.0	16.2	15.7	15.2	15.0	14.8	...	...	...	...
19	20.0	...	19.3	...	18.1	17.3	16.7	16.3	16.0	15.8	15.5	15.3	14.9	14.5
20	20.0	...	19.3	...	18.1	17.3	16.7	16.3	16.0	15.8	15.5	15.3	14.9	14.5
21	20.0	...	19.3	...	18.1	17.3	16.7	16.3	16.0	15.8	15.5	15.3	14.9	14.5
22	20.0	...	19.3	...	18.1	17.3	16.7	16.3	16.0	15.8	15.5	15.3	14.9	14.5
23	20.0	...	19.3	...	18.1	17.3	16.7	16.3	16.0	15.8	15.5	15.3	14.9	14.5
24	20.3	20.2	20.1	19.8	19.5	18.9	18.3	17.7	17.5	17.3	17.0	16.7	16.3	15.8 (23)
25	20.3	20.1	19.9	19.8	19.6	19.3	18.6	18.1	17.8	17.5	17.3	16.9	16.5	16.1 (23)
26	20.8	20.6	20.4	20.2	20.1	20.0	19.3	18.8	18.5	18.3	17.9	17.6	17.2	16.7 (23)
27	21.3	21.1	20.9	20.7	20.5	20.5	20.1	19.6	19.3	19.1	18.7	18.4	17.9	17.5 (23)
28	21.3	21.3	21.3	21.3	21.3	21.2	20.5	19.9	19.6	19.3	19.0	18.7	18.3	17.7 (23)
29	21.3	21.1	21.0	20.7	20.4	20.3	20.3	20.3	20.1	19.8	19.5	19.1	18.6	18.0 (23)
30	21.3	21.1	21.0	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.2	19.8	19.3	18.0 (23)
31	21.3	21.1	21.0	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.0	18.0 (23)
32	21.8	21.6	21.4	21.2	21.0	20.9	20.9	20.9	20.9	20.8	20.4	20.1	19.6	18.0 (23)
33	21.8	21.6	21.4	21.2	21.0	20.9	20.9	20.9	20.9	20.9	20.9	20.7	20.3	18.0 (23)
34	21.7	21.7	21.3	...	20.8	20.8	20.8	20.3	20.0	19.7	19.4	19.1	18.6	18.0
35	21.7	...	21.3	...	20.8	20.8	20.8	20.3	20.0	19.7	...	...	...	...
36	23.3	...	22.9	...	22.4	21.7	20.9	20.3	20.0	19.7	19.4	19.1	18.6	18.0
37	23.3	23.3	22.9	...	22.4	21.7	20.9	20.3	20.0	19.7	19.4	19.1	18.6	18.0
38	23.3	...	23.3	...	23.3	22.5	21.7	20.9	20.5	20.1	19.7	19.2	18.7	13.7
39	23.3	...	23.3	...	23.3	22.5	21.7	20.9	20.5	20.1	...	...	...	...
40	23.3	23.3	23.3	...	23.3	23.3	23.3	23.3	23.1	22.6	22.2	21.6	20.2	13.7
41	20.0	...	18.5	...	17.6	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
42	20.0	...	18.5	...	17.6	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
43	20.0	...	18.5	...	17.6	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
44	20.0	...	18.5	...	17.6	16.8	16.2	15.7	15.4	15.1	...	...	...	...
45	20.0	...	18.5	...	17.6	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Forged pipe	SA-369	FP11	K11597	...	...	4	1
2	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Plate	SA-387	11	K11789	1	...	4	1
3	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Wld. pipe	SA-691	$1\frac{1}{4}\text{CR}$	K11789	...	...	4	1
4	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Forgings	SA-182	F11	K11572	2	...	4	1
5	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Forgings	SA-336	F11	K11572	2	...	4	1
(23) 6	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	$4 < t \leq 10$	4	1
(23) 7	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	$2.25 < t \leq 4$	4	1
(23) 8	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	≤ 2.25	4	1
9	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Forgings	SA-336	F11	K11572	3	...	4	1
10	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Plate	SA-387	11	K11789	2	...	4	1
11	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	Wld. pipe	SA-691	$1\frac{1}{4}\text{CR}$	K11789	NT	...	4	1
12	$1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Cu}$	Forgings	SA-592	E	K11695	...	$2\frac{1}{2} < t \leq 4$	11B	2
13	$1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Cu}$	Forgings	SA-592	E	K11695	...	$\leq 2\frac{1}{2}$	11B	2
14	$1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Ti}$	Plate	SA-517	E	K21604	...	$2\frac{1}{2} < t \leq 6$	11B	2
15	$1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Ti}$	Plate	SA-517	E	K21604	...	$\leq 2\frac{1}{2}$	11B	2
(23) 16	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-182	F22	K21590	1	...	5A	1
17	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-182	F22	K21590	1	...	5A	1
18	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Smls. tube	SA-213	T22	K21590	...	...	5A	1
19	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Fittings	SA-234	WP22	K21590	1	...	5A	1
20	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Wld. fittings	SA-234	WP22	K21590	1/W	...	5A	1
21	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Smls. pipe	SA-335	P22	K21590	...	...	5A	1
22	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-336	F22	K21590	1	...	5A	1
23	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forged pipe	SA-369	FP22	K21590	...	...	5A	1
24	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA-387	22	K21590	1	...	5A	1
25	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Wld. pipe	SA-691	$2\frac{1}{4}\text{CR}$	K21590	...	...	5A	1
(23) 26	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$6 < t \leq 10$	5A	1
(23) 27	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT or QT	$8 < t \leq 20$	5A	1
(23) 28	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$4 < t \leq 6$	5A	1
(23) 29	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$2.5 < t \leq 4$	5A	1
(23) 30	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$1.5 < t \leq 2.5$	5A	1
(23) 31	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$\frac{5}{8} < t \leq 1.5$	5A	1
(23) 32	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$t \leq \frac{5}{8}$	5A	1
33	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Castings	SA-217	WC9	J21890	...	...	5A	1
34	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Castings	SA-217	WC9	J21890	...	...	5A	1
35	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Cast pipe	SA-426	CP22	J21890	...	...	5A	1
36	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-182	F22	K21590	3	...	5A	1
37	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-336	F22	K21590	3	...	5A	1
38	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA-387	22	K21590	2	...	5A	1
39	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Wld. pipe	SA-691	$2\frac{1}{4}\text{CR}$	K21590	NT	...	5A	1
40	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Bar	SA-739	B22	K21390	...	...	5A	1
(23) 41	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT	$t \leq 8$	5A	1
42	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Castings	SA-487	8	J22091	A	...	5C	1
43	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-508	22	K21590	3	...	5C	1
44	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Forgings	SA-541	22	K21390	3	...	5C	1
45	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	Plate	SA-542	B	K21590	4	...	5C	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	60	30	700	900	CS-2	...
2	60	35	700	900	CS-2	E4
3	60	35	700	NP	CS-2	G1, G2
4	70	40	700	900	CS-2	E4
5	70	40	NP	900	CS-2	E4
6	71	55	NP	900	CS-3	E4
7	72.5	56.5	NP	900	CS-3	E4
8	74	58	NP	900	CS-3	E4
9	75	45	NP	700	CS-3	...
10	75	45	700	900	CS-3	E3
11	75	45	700	NP	CS-3	G1, G2
12	105	90	700 (SPT)	700	CS-5	S1
13	115	100	NP	700	HT-1	...
14	105	90	700 (Cl. MC & SPT)	700	CS-5	...
15	115	100	700 (Cl. MC & SPT)	700	HT-1	...
16	60	30	700	NP	CS-2	...
17	60	30	NP	700	CS-2	E3, W2
18	60	30	700	900	CS-2	E3, W2
19	60	30	700	900	CS-2	E3, W2
20	60	30	700	NP	CS-2	...
21	60	30	700	900	CS-2	E3, W2
22	60	30	700	900	CS-2	E3, W2
23	60	30	700	900	CS-2	E3, W2
24	60	30	700	900	CS-2	E3, H1, W2
25	60	30	700	NP	CS-2	G1, G2
26	65.5	36.5	NP	900	CS-3	E4, W5
27	65.5	38.5	NP	900	CS-3	E4, W5
28	66.5	37.5	NP	900	CS-3	E4, W5
29	68	40.5	NP	900	CS-3	E4, W5
30	69.5	42	NP	900	CS-3	E4, W5
31	69.5	43.5	NP	900	CS-3	E4, W5
32	69.5	45	NP	900	CS-3	E4, W5
33	70	40	700	900	CS-2	E4, W2
34	70	40	700 (SPT)	NP	CS-2	...
35	70	40	700	NP	CS-2	...
36	75	45	700	900	CS-3	E3, W2
37	75	45	700	900	CS-3	E3, W2
38	75	45	700	900	CS-3	E3, W2
39	75	45	700	NP	CS-3	G1, G2
40	75	45	700	900	CS-3	E3, W2
41	75.5	45	NP	900	CS-3	E3, W5
42	85	55	700	700	CS-3	...
43	85	55	700	850	CS-2	G21
44	85	55	NP	850	CS-2	G21
45	85	55	NP	850	CS-2	G21

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	18.5	...	17.6	16.8	16.2	15.7	15.4	15.1	14.8	14.4	14.0	13.6
2	20.0	...	20.0	...	20.0	19.6	18.9	18.3	18.0	17.6	17.2	16.8	16.4	15.0
3	20.0	...	20.0	...	20.0	19.6	18.9	18.3	18.0	17.6	...	...	...	...
4	23.3	...	23.3	...	23.3	22.5	21.7	20.9	20.5	20.1	19.7	19.2	18.7	14.5
5	23.3	...	23.3	...	23.3	22.5	21.7	20.9	20.5	20.1	19.7	19.2	18.7	14.5
6	23.7	23.7	23.7	23.6	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.1	20.2	13.7 (23)
7	24.2	24.2	24.2	24.1	23.9	23.9	23.9	23.9	23.9	23.9	23.9	23.6	20.2	13.7 (23)
8	24.7	24.7	24.7	24.5	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.1	20.2	13.7 (23)
9	25.0	25.0	25.0	...	25.0	25.0	24.4	23.5	23.1	22.6	...	...	...	...
10	25.0	...	25.0	...	25.0	25.0	24.4	23.5	23.1	22.6	22.2	21.6	20.2	16.0
11	25.0	...	25.0	...	25.0	25.0	24.4	23.5	23.1	22.6	...	...	...	...
12	35.0	...	35.0	...	35.0	35.0	35.0	35.0	35.0	34.9	...	...	...	...
13	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	38.2	...	...	...	...
14	35.0	...	35.0	...	35.0	35.0	35.0	35.0	35.0	34.9	...	...	...	...
15	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	38.2	...	...	...	...
16	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	...	...	...	...
17	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6 (23)
18	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
19	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
20	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	...	...	...	...
21	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
22	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
23	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
24	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
25	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	...	...	...	...
26	21.8	21.8	21.8	21.5	21.1	20.5	20.0	19.6	19.4	19.1	18.8	18.5	18.0	15.8 (23)
27	21.8	21.8	21.8	21.6	21.3	21.0	20.9	20.8	20.6	20.3	20.0	19.5	19.1	15.8 (23)
28	22.2	22.2	22.2	21.9	21.7	21.3	20.8	20.4	20.2	19.9	19.6	19.2	18.7	15.8 (23)
29	22.7	22.7	22.7	22.4	22.1	21.9	21.8	21.6	21.5	21.2	20.9	20.5	19.9	15.8 (23)
30	23.2	23.2	23.2	22.9	22.6	22.4	22.2	22.1	21.9	21.7	21.4	20.9	20.3	15.8 (23)
31	23.2	23.2	23.2	22.9	22.6	22.4	22.2	22.1	21.9	21.7	21.4	20.9	20.3	15.8 (23)
32	23.2	23.2	23.2	22.9	22.6	22.4	22.2	22.1	21.9	21.7	21.4	20.9	20.3	15.8 (23)
33	23.3	...	23.3	...	23.0	22.6	22.5	22.4	22.2	21.9	21.5	21.0	19.8	16.0
34	23.3	...	23.3	...	23.0	22.6	22.5	22.4	22.2	21.9	...	...	...	...
35	23.3	...	23.3	...	23.0	22.6	22.5	22.4	22.2	21.9	...	...	...	...
36	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	21.9	17.0
37	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	21.9	17.0
38	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	21.9	17.0
39	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	...	...	...	...
40	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	21.9	17.0
41	25.1	25.1	25.1	24.9	24.7	24.3	24.1	24.0	23.9	23.6	23.3	22.7	21.9	15.8 (23)
42	28.3	28.3	28.3	...	27.7	27.4	27.4	27.2	27.0	26.7	...	...	...	...
43	28.3	28.3	28.3	...	27.7	27.4	27.4	27.2	27.0	26.7	26.1	25.4	21.9	...
44	28.3	28.3	28.3	...	27.7	27.4	27.4	27.2	27.0	26.7	26.1	25.4	21.9	...
45	28.3	28.3	28.3	...	27.7	27.4	27.4	27.2	27.0	26.7	26.1	25.4	21.9	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	4	$\geq \frac{1}{4}$	5C	4
2	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-182	F22V	K31835	...	...	5C	1
3	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-336	F22V	K31835	...	...	5C	1
4	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-541	22V	K31835	...	...	5C	1
5	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-542	D	K31835	4a	...	5C	1
6	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-832	22V	K31835	...	...	5C	1
7	3Cr-1Mo	Smls. tube	SA-213	T21	K31545	...	...	5A	1
8	3Cr-1Mo	Smls. pipe	SA-335	P21	K31545	...	...	5A	1
9	3Cr-1Mo	Forgings	SA-336	F21	K31545	1	...	5A	1
10	3Cr-1Mo	Forged pipe	SA-369	FP21	K31545	...	...	5A	1
11	3Cr-1Mo	Plate	SA-387	21	K31545	1	...	5A	1
12	3Cr-1Mo	Cast pipe	SA-426	CP21	J31545	...	...	5A	1
13	3Cr-1Mo	Forgings	SA-182	F21	K31545	...	...	5A	1
14	3Cr-1Mo	Forgings	SA-336	F21	K31545	3	...	5A	1
15	3Cr-1Mo	Plate	SA-387	21	K31545	2	...	5A	1
16	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-182	F3V	K31830	...	...	5C	1
17	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-336	F3V	K31830	...	...	5C	1
18	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-508	3V	K31830	...	...	5C	1
19	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-541	3V	K31830	...	...	5C	1
20	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-542	C	K31830	4a	...	5C	1
21	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-832	21V	K31830	...	...	5C	1
22	5Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T5	K41545	...	...	5B	1
23	5Cr- $\frac{1}{2}$ Mo	Fittings	SA-234	WP5	K41545	...	...	5B	1
24	5Cr- $\frac{1}{2}$ Mo	Wld. fittings	SA-234	WP5	K41545	W	...	5B	1
25	5Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P5	K41545	...	...	5B	1
26	5Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP5	K41545	...	...	5B	1
27	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	1	...	5B	1
28	5Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	5CR	K41545	...	...	5B	1
29	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5	K41545	...	...	5B	1
30	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5	K41545	...	...	5B	1
31	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	2	...	5B	1
32	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5A	K42544	...	...	5B	1
33	5Cr- $\frac{1}{2}$ Mo	Castings	SA-217	C5	J42045	NT	...	5B	1
34	5Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP5	J42045	...	...	5B	1
35	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5a	K42544	...	...	5B	1
36	5Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T5b	K51545	...	...	5B	1
37	5Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P5b	K51545	...	...	5B	1
38	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. tube	SA-213	T5c	K41245	...	...	5B	1
39	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. pipe	SA-335	P5c	K41245	...	...	5B	1
40	9Cr-1Mo	Smls. tube	SA-213	T9	K90941	...	...	5B	1
41	9Cr-1Mo	Fittings	SA-234	WP9	K90941	...	...	5B	1
42	9Cr-1Mo	Smls. pipe	SA-335	P9	K90941	...	...	5B	1
43	9Cr-1Mo	Forged pipe	SA-369	FP9	K90941	...	...	5B	1
44	9Cr-1Mo	Forgings	SA-182	F9	K90941	...	...	5B	1
45	9Cr-1Mo	Forgings	SA-336	F9	K90941	...	...	5B	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	105	85	700	NP	CS-3	S3, W1
2	85	60	NP	900	CS-2	G21
3	85	60	NP	900	CS-2	G21
4	85	60	NP	900	CS-2	G21
5	85	60	NP	900	CS-2	G21
6	85	60	NP	900	CS-2	G21
7	60	30	700	850	CS-2	E3
8	60	30	700	850	CS-2	E3
9	60	30	700	850	CS-2	E3
10	60	30	700	850	CS-2	E3
11	60	30	700	850	CS-2	E3
12	60	30	700	NP	CS-2	...
13	75	45	700	850	CS-3	E3
14	75	45	700	850	CS-3	E3
15	75	45	700	850	CS-3	E3
16	85	60	NP	850	CS-3	G21
17	85	60	NP	850	CS-3	G21
18	85	60	NP	850	CS-3	G21
19	85	60	NP	850	CS-3	G21
20	85	60	NP	850	CS-3	G21
21	85	60	NP	850	CS-3	G21
22	60	30	700	700	CS-2	...
23	60	30	700	700	CS-2	...
24	60	30	700	NP	CS-2	...
25	60	30	700	700	CS-2	...
26	60	30	700	700	CS-2	...
27	60	30	700	700	CS-2	...
28	60	30	700	NP	CS-2	G1, G2
29	60	36	NP	700	CS-2	...
30	70	40	700	700	CS-2	...
31	75	45	700	700	CS-3	...
32	80	50	NP	700	CS-3	...
33	90	60	700	700	CS-3	...
34	90	60	700	NP	CS-3	...
35	90	65	NP	700	CS-5	...
36	60	30	NP	700	CS-2	...
37	60	30	NP	700	CS-2	...
38	60	30	NP	700	CS-2	...
39	60	30	NP	700	CS-2	...
40	60	30	700	700	CS-2	...
41	60	30	NP	700	CS-2	...
42	60	30	700	700	CS-2	...
43	60	30	700	700	CS-2	...
44	85	55	NP	700	CS-3	...
45	85	55	NP	700	CS-3	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	35.0	...	35.0	...	35.0	35.0	34.8	34.3	34.0	33.6	...	...	...	...
2	28.3	...	28.3	...	28.3	28.3	28.3	27.6	27.1	26.5	25.9	25.2	24.5	23.6
3	28.3	...	28.3	...	28.3	28.3	28.3	27.6	27.1	26.5	25.9	25.2	24.5	23.6
4	28.3	...	28.3	...	28.3	28.3	28.3	27.6	27.1	26.5	25.9	25.2	24.5	23.6
5	28.3	...	28.3	...	28.3	28.3	28.3	27.6	27.1	26.5	25.9	25.2	24.5	23.6
6	28.3	...	28.3	...	28.3	28.3	28.3	27.6	27.1	26.5	25.9	25.2	24.5	23.6
7	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	16.0	...
8	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	16.0	...
9	20.0	19.1	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	16.0	...
10	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	16.0	...
11	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	17.9	17.7	16.0	...
12	20.0	...	18.7	...	18.2	18.0	17.9	17.9	17.9	17.9	...	...	...	...
13	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	19.0	...
14	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	19.0	...
15	25.0	...	25.0	...	24.3	24.1	24.0	23.8	23.6	23.4	23.0	22.5	19.0	...
16	28.3	...	28.3	...	27.2	26.4	25.8	25.4	25.2	25.0	24.7	24.3	23.8	...
17	28.3	...	28.3	...	27.2	26.4	25.8	25.4	25.2	25.0	24.7	24.3	23.8	...
18	28.3	...	28.3	...	27.2	26.4	25.8	25.4	25.2	25.0	24.7	24.3	23.8	...
19	28.3	...	28.3	...	27.2	26.4	25.8	25.4	25.2	25.0	24.7	24.3	23.8	...
20	28.3	...	28.3	...	27.2	26.4	25.8	25.4	25.2	25.0	24.7	24.3	23.8	...
21	28.3	...	28.3	...	27.2	26.4	25.8	25.4	25.2	25.0	24.7	24.3	23.8	...
22	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
23	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
24	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
25	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
26	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
27	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
28	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
29	20.0	...	20.0	...	19.4	19.2	19.2	18.9	18.6	18.2	...	...	...	...
30	23.3	...	23.3	...	22.6	22.4	22.4	22.0	21.7	21.2	...	...	...	...
31	25.0	...	24.9	...	24.2	24.0	24.0	23.6	23.2	22.7	...	...	...	...
32	26.7	...	26.6	...	25.8	25.6	25.6	25.2	24.8	24.3	...	...	...	...
33	30.0	...	29.9	...	29.1	28.8	28.7	28.3	27.9	27.3	...	...	...	...
34	30.0	...	29.9	...	29.1	28.8	28.7	28.3	27.9	27.3	...	...	...	...
35	30.0	...	29.9	...	29.1	28.8	28.7	28.3	27.9	27.3	...	...	...	...
36	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
37	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
38	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
39	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
40	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
41	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
42	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
43	20.0	...	18.1	...	17.4	17.2	17.1	16.8	16.6	16.3	...	...	...	...
44	28.3	...	28.3	...	27.4	27.2	27.1	26.8	26.3	25.8	...	...	...	...
45	28.3	...	28.3	...	27.4	27.2	27.1	26.8	26.3	25.8	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	9Cr-1Mo	Castings	SA-217	C12	J82090	NT	...	5B	1
2	9Cr-1Mo	Cast pipe	SA-426	CP9	J82090	...	...	5B	1
3	9Cr-1Mo-V	Smls. tube	SA-213	T91 Type 1	K90901	...	...	15E	1
4	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Type 1	K90901	...	...	15E	1
5	9Cr-1Mo-V	Plate	SA-387	91 Type 1	K90901	2	...	15E	1
(23) 6	9Cr-1Mo-V	Forgings	SA-182	F91 Type 1	K90901	...	...	15E	1
7	9Cr-1Mo-V	Forgings	SA-336	F91	K90901	...	...	15E	1
8	12Cr	Bar	SA-479	403	S40300	A	...	6	1
9	12Cr	Bar	SA-479	403	S40300	1	...	6	1
10	12Cr-Al	Plate	SA-240	405	S40500	...	...	7	1
11	12Cr-Al	Bar	SA-479	405	S40500	...	...	7	1
12	12Cr-Al	Bar	SA/JIS G4303	SUS405	...	...	...	7	1
13	12Cr-Al	Smls. tube	SA-268	TP405	S40500	...	...	7	1
14	12 $\frac{1}{2}$ Cr-2Ni	Bar	SA-479	414	S41400	...	...	6	4
15	13Cr	Plate	SA-240	410S	S41008	...	...	7	1
16	13Cr	Smls. tube	SA-268	TP410	S41000	...	...	6	1
17	13Cr	Plate	SA-240	410	S41000	...	...	6	1
18	13Cr	Forgings	SA-182	F6a	S41000	1	...	6	1
19	13Cr	Bar	SA-479	410	S41000	A	...	6	1
20	13Cr	Bar	SA-479	410	S41000	1	...	6	1
(23) 21	13Cr	Forgings	SA-182	F6a	S41000	1	...	6	3
22	13Cr	Forgings	SA-182	F6a	S41000	2	...	6	3
23	13Cr	Forgings	SA-336	F6	S41000	...	...	6	3
24	13Cr	Castings	SA-217	CA15	J91150	...	...	6	3
25	13Cr	Cast pipe	SA-426	CPCA15	J91150	...	...	6	3
26	13Cr	Bar	SA/EN 10088-3	X12Cr13	...	QT650	$t \leq 6.25$	...	...
27	13Cr-4Ni	Castings	SA-487	CA6NM	J91540	A	...	6	4
28	13Cr-4Ni	Forgings	SA-182	F6NM	S41500	...	...	6	4
29	13Cr-4Ni	Bar	SA-479	...	S41500	...	...	6	4
30	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	...	...	...	...
31	15Cr	Smls. tube	SA-268	TP429	S42900	...	...	6	2
32	15Cr	Plate	SA-240	429	S42900	...	...	6	2
33	17Cr	Smls. tube	SA-268	TP430	S43000	...	...	7	2
34	17Cr	Plate	SA-240	430	S43000	...	...	7	2
35	17Cr-4Ni-4Cu	Forgings, bar	SA-564	630	S17400	H1150	...	...	...
36	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1150	...	...	...
37	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1150	...	...	...
(23) 38	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1100	...	...	...
(23) 39	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1100	...	...	...
(23) 40	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1100	...	...	...
41	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1075	...	...	...
42	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1075	...	...	...
43	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1075	...	...	...
44	26Cr-3Ni-3Mo	Plate	SA-240	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K	1
45	26Cr-3Ni-3Mo	Smls. tube	SA-268	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	90	60	700 (SPT)	700	CS-3	...
2	90	60	700	NP	CS-3	...
3	85	60	700	900	CS-3	...
4	85	60	700	900	CS-3	...
5	85	60	700	900	CS-3	...
6	90	60	700	900	CS-3	...
7	85	60	NP	900	CS-3	...
8	70	40	700	NP	...	...
9	70	40	700	NP	...	...
10	60	25	700	800	CS-1	G13
11	60	25	700	NP	CS-1	G13
12	60	25	700	NP	CS-1	G13
13	60	30	NP	800	CS-2	G13
14	115	90	700	NP	CS-3	...
15	60	30	700	800	CS-2	...
16	60	30	NP	800	CS-2	...
17	65	30	NP	800	CS-2	...
18	70	40	700	NP	CS-2	...
19	70	40	700	NP	CS-2	...
20	70	40	700	NP	CS-2	...
21	70	40	NP	800	CS-3	E3
22	85	55	700	800	CS-3	...
23	85	55	NP	800	CS-3	...
24	90	65	700	100	CS-5	...
25	90	65	700	NP	CS-5	...
26	94.5	65.5	700 (SPT)	NP	...	H2, W1
27	110	80	700	NP	CS-5	...
28	115	90	700	NP	CS-3	...
29	115	90	700	NP	CS-3	...
30	150	135	600	NP	HA-7	W1
31	60	35	NP	800	CS-2	G13
32	65	30	NP	800	CS-2	G13
33	60	35	NP	800	CS-2	G13
34	65	30	NP	800	CS-2	G13
35	135	105	650	NP	HT-1	G8, W1
36	135	105	650	NP	HT-1	G8, W1
37	135	105	650	NP	HT-1	G8, W1
38	140	115	NP	600	HT-1	G8, W1
39	140	115	NP	600	HT-1	G8, W1
40	140	115	NP	600	HT-1	G8, W1
41	145	125	650	NP	HT-1	G8, W1
42	145	125	650	NP	HT-1	G8, W1
43	145	125	650	NP	HT-1	G8, W1
44	85	65	NP	700	HA-5	G13, H6
45	85	65	NP	700	HA-5	G13, H6

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	30.0	...	29.9	...	29.1	28.8	28.7	28.3	27.9	27.3	...	...	...	...
2	30.0	...	29.9	...	29.1	28.8	28.7	28.3	27.9	27.3	...	...	...	...
3	28.3	...	28.3	...	28.3	28.2	28.1	27.7	27.3	26.7	25.9	24.9	23.7	22.3
4	28.3	...	28.3	...	28.3	28.2	28.1	27.7	27.3	26.7	25.9	24.9	23.7	22.3
5	28.3	...	28.3	...	28.3	28.2	28.1	27.7	27.3	26.7	25.9	24.9	23.7	22.3
6	30.0	...	30.0	...	30.0	29.9	29.8	29.3	28.9	28.2	27.4	26.4	25.1	23.6
7	28.3	28.3	28.3	28.3	28.3	28.2	28.1	27.7	27.3	26.7	25.9	24.9	23.7	22.3 (23)
8	23.3	...	23.3	...	22.9	22.5	22.1	21.6	21.2	20.6	...	...	...	...
9	23.3	...	23.3	...	22.9	22.5	22.1	21.6	21.2	20.6	...	...	...	...
10	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	13.1	12.6	...	...
11	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	...	...	...	...
12	16.7	...	15.3	...	14.8	14.5	14.3	14.0	13.8	13.5	...	...	...	...
13	20.0	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	...	...
14	38.3	38.3	38.3	...	37.7	36.8	36.0	35.1	34.5	33.7	...	...	...	...
15	20.0	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	...	...
16	20.0	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	...	...
17	20.0	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	...	...
18	23.3	...	23.3	...	22.9	22.5	22.1	21.6	21.2	20.6	...	...	...	...
19	23.3	...	23.3	...	22.9	22.5	22.1	21.6	21.2	20.6	...	...	...	...
20	23.3	...	23.3	...	22.9	22.5	22.1	21.6	21.2	20.6	...	...	...	...
21	23.3	23.3	23.3	23.1	22.9	22.5	22.1	21.6	21.2	20.6	20.0	19.2	17.2	12.3 (23)
22	28.3	...	28.3	...	27.8	27.3	26.9	26.2	25.7	25.1	24.3	23.3	...	...
23	28.3	...	28.3	...	27.8	27.3	26.9	26.2	25.7	25.1	24.3	23.3	...	...
24	30.0	...	30.0	...	29.4	28.9	28.4	27.7	27.2	26.5	...	...	...	...
25	30.0	...	30.0	...	29.4	28.9	28.4	27.7	27.2	26.5	...	...	...	...
26	31.4	31.4	31.4	31.2	30.8	30.2	29.8	29.1	28.5	27.8	...	...	...	...
27	36.7	...	36.7	...	36.0	35.1	34.4	33.6	33.1	32.6	...	...	...	...
28	38.3	...	38.3	...	38.3	37.9	36.5	35.0	34.3	33.4	...	...	...	...
29	38.3	...	38.3	...	38.3	37.9	36.5	35.0	34.3	33.4	...	...	...	...
30	50.0	50.0	50.0	...	50.0	49.3	47.7	45.7	...	...	...	...	...	...
31	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	17.1	16.4	...	...
32	20.0	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	...	...
33	20.0	...	20.0	...	19.6	19.3	19.0	18.5	18.1	17.7	17.1	16.4	...	...
34	20.0	...	18.4	...	17.8	17.4	17.2	16.8	16.6	16.2	15.7	15.1	...	...
35	45.0	...	45.0	...	45.0	43.7	42.9	42.2	41.8	...	...	...	...	...
36	45.0	...	45.0	...	45.0	43.7	42.9	42.2	41.8	...	...	...	...	...
37	45.0	...	45.0	...	45.0	43.7	42.9	42.2	41.8	...	...	...	...	...
38	46.7	...	46.7	...	46.7	45.4	44.5	43.8	43.4	...	...	...	...	...
39	46.7	...	46.7	...	46.7	45.4	44.5	43.8	43.4	...	...	...	...	...
40	46.7	...	46.7	...	46.7	45.4	44.5	43.8	43.4	...	...	...	...	...
41	48.3	...	48.3	...	48.3	47.0	46.1	45.4	44.9	...	...	...	...	...
42	48.3	...	48.3	...	48.3	47.0	46.1	45.4	44.9	...	...	...	...	...
43	48.3	...	48.3	...	48.3	47.0	46.1	45.4	44.9	...	...	...	...	...
44	28.3	...	28.3	...	28.3	27.9	27.7	27.6	27.5	27.3	...	...	...	...
45	28.3	...	28.3	...	28.3	27.9	27.7	27.6	27.5	27.3	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design/ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	26Cr-3Ni-3Mo	Wld. tube	SA-268	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K	1
2	26Cr-3Ni-3Mo	Wld. tube	SA-803	26-3-3	S44660	...	$\leq \frac{2}{10}$	10K	1
3	27Cr-1Mo	Plate	SA-240	XM-27	S44627	...	...	10I	1
4	27Cr-1Mo	Smls. & wld. tube	SA-268	TPXM-27	S44627	...	...	10I	1
5	27Cr-1Mo	Bar	SA-479	XM-27	S44627	...	...	10I	1
(23) 6	29Cr-4Mo-Ti	Smls. tube	SA-268	...	S44735	...	...	10J	1
7	Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	NT	...	...	...
8	Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	QT	...	...	...
9	Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	A	...	3	3
10	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	A	K12021	...	...	3	2
11	Mn- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	H75	K12021	...	...	3	2
12	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	B	K12022	...	...	3	3
13	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	1	...	3	3
14	Mn- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	H80	K12022	...	...	3	3
15	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	2	...	3	3
16	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	3	...	11A	4
17	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	1	...	3	3
18	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	2	...	3	3
19	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	3	...	11A	4
20	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-302	C	K12039	...	...	3	3
21	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	1	...	3	3
22	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J80	K12539	...	...	3	3
23	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	2	...	3	3
24	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J90	K12539	...	...	3	3
25	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	3	...	11A	4
26	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J100	K12539	...	...	11A	4
27	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-302	D	K12054	...	...	3	3
28	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	1	...	3	3
(23) 29	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	1	...	3	3
30	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	2	...	3	3
31	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	3	...	11A	4
(23) 32	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	2	...	3	3
(23) 33	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	B	K12554	3	...	3	3
(23) 34	Mn- $\frac{1}{2}$ Ni-V	Plate	SA/NF A 36-215	P440NJ4	...	...	$\frac{5}{16} \leq t \leq 0.79$	10A	1
35	Mn- $\frac{1}{2}$ Ni-V	Plate	SA-225	C	K12524	...	...	10A	1
36	Mn-V	Castings	SA-487	1	J13002	A/NT	...	10A	1
37	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	A/NT	...	3	3
38	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	1	...	3	3
39	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	2	...	3	3
40	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...	$2\frac{1}{2} < t \leq 4$	11B	3
41	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Plate	SA-517	F	K11576	...	$\leq 2\frac{1}{2}$	11B	3
42	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...	$\leq 2\frac{1}{2}$	11B	3
43	$\frac{1}{4}$ Ni- $\frac{1}{2}$ Cu-Mo	Smls. tube	SA-423	2	K11540	...	...	4	2
44	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	1	...	3	3
45	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	1	...	3	3

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	85	65	NP	700	HA-5	G13, G18, H6
2	85	65	NP	600	HA-5	G13, G18, H6
3	65	40	650	NP	HA-2	G13
4	65	40	650	NP	HA-2	G13
5	65	40	650	NP	HA-2	G13
6	75	60	NP	600	HA-6	G13
7	105	65	NP	650	CS-5	G19, W5, W6
8	105	65	NP	650	CS-5	G19, W5, W6
9	85	53	700 (SPT)	NP	CS-3	...
10	75	45	700	700	CS-3	...
11	75	45	700	NP	CS-3	G1, G2
12	80	50	700	700	CS-3	...
13	80	50	700	700	CS-5	...
14	80	50	700	NP	CS-3	G1, G2
15	90	70	700	700	CS-5	...
16	100	83	700	NP	CS-5	...
17	80	50	700	NP	CS-5	...
18	90	70	700	700	CS-5	...
19	100	83	700	700	CS-5	...
20	80	50	700	700	CS-3	...
21	80	50	700	700	CS-5	...
22	80	50	700	NP	CS-5	G1, G2
23	90	70	700	700	CS-5	...
24	90	70	700	NP	CS-5	G1, G2
25	100	83	700	700	CS-5	...
26	100	83	700	NP	CS-5	G1, G2
27	80	50	700	700	CS-3	...
28	80	50	700	700	CS-5	...
29	80	50	NP	700	CS-5	...
30	90	70	700	700	CS-5	...
31	100	83	700	NP	CS-5	...
32	90	70	NP	700	CS-5	...
33	100	83	NP	700	CS-5	...
34	91.5	64	NP	150	CS-5	...
35	105	70	NP	700	CS-5	...
36	85	55	700 (SPT)	700	CS-3	...
37	90	60	700	700	CS-3	...
38	80	50	700	700	CS-5	...
39	90	65	700	700	CS-5	...
40	105	90	700 (SPT)	700	CS-5	S1
41	115	100	700 (SPT)	700	HT-1	...
42	115	100	NP	700	HT-1	...
43	60	37	NP	700	CS-2	...
44	80	50	700	700	CS-5	...
45	80	50	700	700	CS-5	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	24.1	...	24.1	...	24.0	23.7	23.6	23.4	23.3	23.2	...	...	...	...
2	24.1	...	24.1	...	24.0	23.7	23.6	23.4	...	...	...	...	...	...
3	21.7	...	21.7	...	20.9	19.5	18.9	18.7	18.6	...	...	...	...	...
4	21.7	...	21.7	...	20.9	19.5	18.9	18.7	18.6	...	...	...	...	...
5	21.7	...	21.7	...	20.9	19.5	18.9	18.7	18.6	...	...	...	...	...
6	25.0	...	24.6	...	24.2	24.0	23.6	23.3	23.2	23.0	22.7	...	...	...
7	35.0	...	33.3	...	32.8	32.8	32.8	32.8	32.8	...	...	...	...	...
8	35.0	...	33.3	...	32.8	32.8	32.8	32.8	32.8	...	...	...	...	...
9	28.3	...	28.3	...	28.3	28.2	28.2	27.3	27.0	26.5	...	...	...	...
10	25.0	...	25.0	...	25.0	25.0	25.0	25.0	24.9	24.4	...	...	...	...
11	25.0	...	25.0	...	25.0	25.0	25.0	25.0	24.9	24.4	...	...	...	...
12	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
13	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
14	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
15	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
16	33.3	...	33.3	...	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...
17	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
18	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
19	33.3	...	33.3	...	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...
20	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
21	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
22	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
23	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
24	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
25	33.3	...	33.3	...	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...
26	33.3	...	33.3	...	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...
27	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
28	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
29	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
30	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
31	33.3	...	33.3	...	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...
32	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
33	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...
34	30.5	30.5	...	...	...	...	...	...	...	...	...	...	...	...
35	35.0	35.0	35.0	...	35.0	35.0	35.0	34.9	34.0	33.3	...	...	...	...
36	28.4	...	26.8	...	26.1	26.1	26.1	25.6	25.1	24.4	...	...	...	...
37	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
38	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
39	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
40	35.0	...	35.0	...	35.0	35.0	35.0	35.0	34.9	34.3	...	...	...	...
41	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	37.5	...	...	...	...
42	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	37.5	...	...	...	...
43	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...
44	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
45	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Mo}-\frac{1}{3}\text{Cr}-\text{V}$	Forgings	SA-508	2	K12766	2	...	3	3
2	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Mo}-\frac{1}{3}\text{Cr}-\text{V}$	Forgings	SA-541	2	K12765	2	...	3	3
3	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Mo}-\text{Cr}-\text{V}$	Forgings	SA-508	3	K12042	1	...	3	3
4	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Mo}-\text{Cr}-\text{V}$	Forgings	SA-508	3	K12042	2	...	3	3
5	$\frac{3}{4}\text{Ni}-1\text{Mo}-\frac{3}{4}\text{Cr}$	Castings	SA-217	WC5	J22000	...	...	4	1
6	$1\text{Ni}-\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Castings	SA-217	WC4	J12082	...	...	4	1
7	$1\frac{1}{4}\text{Ni}-1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-517	P	K21650	...	$2\frac{1}{2} < t \leq 4$	11B	8
8	$1\frac{1}{4}\text{Ni}-1\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-517	P	K21650	...	$\leq 2\frac{1}{2}$	11B	8
9	$2\text{Ni}-1\text{Cu}$	Forgings	SA-182	FR	K22035	...	...	9A	1
10	$2\text{Ni}-1\text{Cu}$	Smls. pipe	SA-333	9	K22035	...	...	9A	1
11	$2\text{Ni}-1\text{Cu}$	Smls. pipe	SA-334	9	K22035	...	...	9A	1
12	$2\text{Ni}-1\text{Cu}$	Forgings	SA-350	LF9	K22036	...	...	9A	1
13	$2\text{Ni}-1\text{Cu}$	Fittings	SA-420	WPL9	K22035	...	...	9A	1
14	$2\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$	Forgings	SA-723	1	K23550	1	...	...	...
15	$2\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$	Forgings	SA-723	1	K23550	2	...	...	...
16	$2\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$	Forgings	SA-723	1	K23550	3	...	...	...
17	$2\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$	Forgings	SA-723	1	K23550	4	...	...	...
18	$2\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$	Forgings	SA-723	1	K23550	5	...	...	...
19	$2\frac{1}{2}\text{Ni}$	Plate	SA-203	A	K21703	...	...	9A	1
20	$2\frac{1}{2}\text{Ni}$	Plate	SA-203	B	K22103	...	...	9A	1
21	$2\frac{1}{2}\text{Ni}$	Castings	SA-352	LC2	J22500	...	...	9A	1
22	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-543	C	...	3	...	3	3
23	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-543	C	...	1	...	11A	5
24	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-543	C	...	2	...	11B	10
25	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	2	K34035	1	...	...	...
26	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	2	K34035	2	...	...	...
27	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	2	K34035	3	...	...	...
28	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	2	K34035	4	...	...	...
29	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	2	K34035	5	...	...	...
30	$3\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-543	B	K42339	3	...	3	3
31	$3\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-543	B	K42339	1	...	11A	5
32	$3\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	Plate	SA-543	B	K42339	2	...	11B	10
33	$3\frac{1}{2}\text{Ni}$	Smls. pipe	SA-333	3	K31918	...	...	9B	1
34	$3\frac{1}{2}\text{Ni}$	Smls. tube	SA-334	3	K31918	...	...	9B	1
35	$3\frac{1}{2}\text{Ni}$	Fittings	SA-420	WPL3	...	...	...	9B	1
36	$3\frac{1}{2}\text{Ni}$	Plate	SA-203	D	K31718	...	...	9B	1
37	$3\frac{1}{2}\text{Ni}$	Forgings	SA-350	LF3	K32025	...	...	9B	1
38	$3\frac{1}{2}\text{Ni}$	Forgings	SA-765	III	K32026	...	...	9B	1
39	$3\frac{1}{2}\text{Ni}$	Plate	SA-203	E	K32018	...	...	9B	1
40	$3\frac{1}{2}\text{Ni}$	Plate	SA-203	E	K32018	...	...	9B	1
41	$3\frac{1}{2}\text{Ni}$	Castings	SA-352	LC3	J31550	...	...	9B	1
42	$3\frac{1}{2}\text{Ni}$	Plate	SA-203	F	...	...	>2	9B	1
43	$3\frac{1}{2}\text{Ni}$	Plate	SA-203	F	...	...	≤ 2	9B	1
44	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-508	4N	K22375	3	...	3	3
45	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-508	4N	K22375	1	...	11A	5

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	90	65	700	700	CS-5	...
2	90	65	700	700	CS-5	...
3	80	50	700	700	CS-5	...
4	90	65	700	700	CS-5	...
5	70	40	700	700	CS-2	...
6	70	40	700 (SPT)	700	CS-2	...
7	105	90	700 (SPT)	700	CS-5	...
8	115	100	700 (SPT)	700	HT-1	...
9	63	46	NP	100	CS-3	...
10	63	46	NP	100	CS-3	...
11	63	46	NP	100	CS-3	...
12	63	46	NP	100	CS-3	...
13	63	46	NP	100	CS-3	...
14	115	100	700 (SPT)	700	HT-1	G14, G20, W1
15	135	120	700 (SPT)	700	HT-1	G6, G20, W1
16	155	140	700 (SPT)	NP	HT-1	W1
17	175	160	700 (SPT)	NP	HT-1	W1
18	190	180	700 (SPT)	NP	HT-1	W1
19	65	37	NP	300	CS-2	...
20	70	40	NP	300	CS-2	...
21	70	40	100	100	CS-2	...
22	90	70	NP	650	CS-5	...
23	105	85	NP	650	CS-5	...
24	115	100	NP	650	HT-1	...
25	115	100	700 (SPT)	700	HT-1	G14, G20, W1
26	135	120	700 (SPT)	700	HT-1	G6, G20, W1
27	155	140	700 (SPT)	NP	HT-1	W1
28	175	160	700 (SPT)	NP	HT-1	W1
29	190	180	700 (SPT)	NP	HT-1	W1
30	90	70	NP	650	CS-5	...
31	105	85	650	650	CS-5	G5, H3, S4, W3
32	115	100	NP	650	HT-1	...
33	65	35	NP	100	CS-2	...
34	65	35	NP	100	CS-2	...
35	65	35	NP	300	CS-2	...
36	65	37	NP	300	CS-2	...
37	70	37.5	700	300	CS-2	...
38	70	37.5	NP	100	CS-2	...
39	70	40	300 (SPT)	300	CS-2	...
40	70	40	500	NP	CS-2	...
41	70	40	100	100	CS-2	...
42	75	50	NP	100	CS-3	...
43	80	55	NP	100	CS-3	...
44	90	70	650	700	CS-5	...
45	105	85	650	700	CS-5	H3, S4, W3

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
2	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
3	26.7	26.7	26.7	...	26.7	26.7	26.7	26.7	26.7	26.7	...	...	...	...
4	30.0	...	30.0	...	30.0	30.0	30.0	30.0	30.0	30.0	...	...	...	...
5	23.3	...	23.3	...	23.3	23.3	23.0	22.4	22.1	21.7	...	...	...	...
6	23.3	...	23.3	...	23.3	23.3	23.0	22.4	22.1	21.7	...	...	...	...
7	35.0	...	35.0	...	35.0	35.0	35.0	35.0	34.9	34.3	...	...	...	...
8	38.3	...	38.3	...	38.3	38.3	38.3	38.3	38.3	37.5	...	...	...	...
9	21.0	...	...	...	...	...	...	...	...	...	...	...	...	...
10	21.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	21.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	21.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	21.0	...	...	...	...	...	...	...	...	...	...	...	...	...
14	38.3	...	38.3	...	38.3	38.3	38.3	38.3	37.7	36.8	...	...	...	...
15	45.0	...	45.0	...	45.0	45.0	45.0	45.0	44.3	43.2	...	...	...	...
16	51.7	...	51.7	...	51.7	51.7	51.7	51.7	50.9	49.7	...	...	...	...
17	58.3	...	58.3	...	58.3	58.3	58.3	58.3	57.4	56.1	...	...	...	...
18	63.3	...	63.3	...	63.3	63.3	63.3	63.3	62.4	60.9	...	...	...	...
19	21.7	...	21.7	...	21.7	...	...	...	...	...	...	...	...	...
20	23.3	...	23.3	...	23.3	...	...	...	...	...	...	...	...	...
21	23.3	...	...	...	...	...	...	...	...	...	...	...	...	...
22	30.0	...	30.0	...	30.0	29.7	29.5	29.1	28.7	...	...	...	...	...
23	35.0	...	35.0	...	35.0	34.6	34.4	34.0	33.5	...	...	...	...	...
24	38.3	...	38.3	...	38.3	37.9	37.7	37.2	36.7	...	...	...	...	...
25	38.3	...	38.3	...	38.3	38.3	38.3	38.3	37.7	36.8	...	...	...	...
26	45.0	...	45.0	...	45.0	45.0	45.0	45.0	44.3	43.2	...	...	...	...
27	51.7	...	51.7	...	51.7	51.7	51.7	51.7	50.9	49.7	...	...	...	...
28	58.3	...	58.3	...	58.3	58.3	58.3	58.3	57.4	56.1	...	...	...	...
29	63.3	...	63.3	...	63.3	63.3	63.3	63.3	62.4	60.9	...	...	...	...
30	30.0	...	30.0	...	30.0	29.7	29.5	29.1	28.7	...	...	...	...	...
31	35.0	...	35.0	...	35.0	34.6	34.4	34.0	33.5	...	...	...	...	...
32	38.3	...	38.3	...	38.3	37.9	37.7	37.2	36.7	...	...	...	...	...
33	21.7	...	...	...	...	...	...	...	...	...	...	...	...	...
34	21.7	...	...	...	...	...	...	...	...	...	...	...	...	...
35	21.7	...	21.4	...	20.6	...	...	...	...	...	...	...	...	...
36	21.7	...	21.7	...	21.7	...	...	...	...	...	...	...	...	...
37	23.3	...	22.9	...	22.1	21.4	20.3	18.8	17.9	16.9	...	...	...	...
38	23.3	...	...	...	...	...	...	...	...	...	...	...	...	...
39	23.3	...	23.3	...	23.3	...	...	...	...	...	...	...	...	...
40	23.3	...	23.3	...	23.3	22.9	21.6	...	...	...	...	...	...	...
41	23.3	...	...	...	...	...	...	...	...	...	...	...	...	...
42	25.0	...	...	...	...	...	...	...	...	...	...	...	...	...
43	26.7	...	...	...	...	...	...	...	...	...	...	...	...	...
44	30.0	30.0	30.0	30.0	30.0	29.7	29.5	29.1	28.7	28.2	...	...	...	...
45	35.0	35.0	35.0	35.0	35.0	34.6	34.4	34.0	33.5	32.9	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375	2	...	11B	10
2	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	1	...	...	...
3	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	2	...	...	...
4	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	3	...	...	...
5	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	4	...	...	...
6	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	5	...	...	...
7	5Ni-¼Mo	Plate	SA-645	...	K41583	...	...	11A	2
8	7Ni	Plate	SA-553	III	K61365	...	≤2	11A	1
9	7Ni	Plate	SA-553	III	K61365	...	≤2	11A	1
10	8Ni	Plate	SA-553	II	K71340	...	...	11A	1
11	8Ni	Plate	SA-553	II	K71340	...	...	11A	1
12	9Ni	Smls. pipe	SA-333	8	K81340	...	...	11A	1
13	9Ni	Smls. pipe	SA-333	8	K81340	...	...	11A	1
14	9Ni	Smls. tube	SA-334	8	K81340	...	...	11A	1
15	9Ni	Smls. tube	SA-334	8	K81340	...	...	11A	1
16	9Ni	Plate	SA-353	...	K81340	...	...	11A	1
17	9Ni	Plate	SA-353	...	K81340	...	...	11A	1
18	9Ni	Fittings	SA-420	WPL8	K81340	...	...	11A	1
19	9Ni	Fittings	SA-420	WPL8	K81340	...	...	11A	1
20	9Ni	Forgings	SA-522	I	K81340	...	...	11A	1
21	9Ni	Forgings	SA-522	I	K81340	...	...	11A	1
22	9Ni	Plate	SA-553	I	K81340	...	...	11A	1
23	9Ni	Plate	SA-553	I	K81340	...	...	11A	1
24	25Ni-15Cr-2Ti	Forgings, bar	SA-638	660	S66286	...	...	...	...
(23) 25	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	8	3
(23) 26	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	8	3
27	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	>5	8	1
28	16Cr-12Ni-2Mo	Forgings	SA-965	F316L	S31603	...	...	8	1
29	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	≤5	8	1
30	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...	...	8	1
31	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...	...	8	1
32	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	...	8	1
33	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	...	8	1
34	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	...	...	8	1
35	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316L	S31603	...	...	8	1
36	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	...	...	8	1
37	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	1	...	8	1
38	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	3	...	8	1
39	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	4	...	8	1
40	16Cr-12Ni-2Mo	Fittings	SA-403	316L	S31603	...	...	8	1
41	16Cr-12Ni-2Mo	Fittings	SA-403	316L	S31603	CR	...	8	1
42	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316L	S31603	WP-W	...	8	1
43	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316L	S31603	WP-W	...	8	1
44	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316L	S31603	WP-WX	...	8	1
45	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	115	100	NP	650	HT-1	...
2	115	100	700 (SPT)	700	HT-1	G14, G20, W1
3	135	120	700 (SPT)	700	HT-1	G6, G20, W1
4	155	140	700 (SPT)	NP	HT-1	W1
5	175	160	700 (SPT)	NP	HT-1	W1
6	190	180	700 (SPT)	NP	HT-1	W1
7	95	65	NP	250	CS-3	W4
8	100	85	NP	150	CS-3	W7
9	100	85	NP	150	CS-3	W4
10	100	85	NP	250	CS-3	W7
11	100	85	NP	250	CS-3	W4
12	100	75	NP	250	CS-3	W7
13	100	75	NP	250	CS-3	W4
14	100	75	NP	250	CS-3	W7
15	100	75	NP	250	CS-3	W4
16	100	75	NP	250	CS-3	W7
17	100	75	NP	250	CS-3	W4
18	100	75	NP	250	CS-3	W7
19	100	75	NP	250	CS-3	W4
20	100	75	NP	250	CS-3	G19, S6, W7
21	100	75	NP	250	CS-3	G19, S6, W4
22	100	85	NP	250	CS-3	W7
23	100	85	NP	250	CS-3	W4
24	130	85	700	NP	HA-5	W1
25	95	45	NP	100	HA-6	...
26	95	45	NP	800	HA-6	G7
27	65	25	800	800	HA-4	G7
28	65	25	800	800	HA-4	G7
29	70	25	800	800	HA-4	G7
30	70	25	800	800	HA-4	G7
31	70	25	800	800	HA-4	G7
32	70	25	800	NP	HA-4	G7
33	70	25	NP	800	HA-4	G7, G18
34	70	25	800	NP	HA-4	G7
35	70	25	800	800	HA-4	G7
36	70	25	NP	800	HA-4	G7, G18
37	70	25	800	NP	HA-4	G7
38	70	25	800	NP	HA-4	G7
39	70	25	800	NP	HA-4	G7
40	70	25	800	NP	HA-4	G7
41	70	25	NP	800	HA-4	G7, G18
42	70	25	800	NP	HA-4	G7
43	70	25	NP	800	HA-4	G7, G18
44	70	25	NP	800	HA-4	G7, G18
45	70	25	800	NP	HA-4	G7

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	38.3	38.3	38.3	38.3	38.3	37.9	37.7	37.2	36.7	...	...	...	...	...
2	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	37.7	36.8	...	...	...	...
3	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.3	43.2	...	...	...	...
4	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	50.9	49.7	...	...	...	...
5	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	57.4	56.1	...	...	...	...
6	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	62.4	60.9	...	...	...	...
7	30.1	30.1	28.1	27.7	...	...	...	...	...	...	...	...	...	...
8	33.3	33.3	...	...	...	...	...	...	...	...	...	...	...	...
9	31.7	31.7	...	...	...	...	...	...	...	...	...	...	...	...
10	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
11	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
12	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
13	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
14	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
15	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
16	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
17	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
18	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
19	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
20	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
21	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
22	33.3	33.3	31.1	30.2	...	...	...	...	...	...	...	...	...	...
23	31.7	31.7	29.6	28.7	...	...	...	...	...	...	...	...	...	...
24	43.3	...	43.3	...	43.3	43.3	42.5	41.7	41.3	40.9	...	...	...	...
25	30.0	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	30.0	...	27.6	...	24.7	23.4	23.0	22.9	22.8	22.6	22.3	22.0	21.5	21.0 (23)
27	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
28	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
29	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
30	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
31	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
32	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
33	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	...	...
34	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
35	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
36	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	...	...
37	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
38	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
39	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
40	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
41	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	...	...
42	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
43	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	...	...
44	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	...	...
45	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316L	S31603	...	...	8	1
2	16Cr-12Ni-2Mo	Wld. pipe	SA-688	TP316L	S31603	...	...	8	1
3	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316L	S31603	...	...	8	1
4	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316L	S31603	...	...	8	1
5	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316L	...	...	...	8	1
6	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	>5	8	1
7	16Cr-12Ni-2Mo	Forgings	SA-965	F316	S31600	...	...	8	1
8	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	>5	8	1
9	16Cr-12Ni-2Mo	Forgings	SA-965	F316H	S31609	...	...	8	1
10	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	≤5	8	1
11	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
12	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...	...	8	1
13	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
14	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
15	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
16	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316	S31600	...	...	8	1
17	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
18	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	1	...	8	1
19	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	3	...	8	1
20	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	4	...	8	1
21	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
22	16Cr-12Ni-2Mo	Fittings	SA-403	316	S31600	...	...	8	1
23	16Cr-12Ni-2Mo	Fittings	SA-403	316	S31600	WP-S	...	8	1
24	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316	S31600	WP-W	...	8	1
25	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	...	...	8	1
26	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
27	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
28	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316	S31600	...	...	8	1
29	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316	S31600	...	...	8	1
30	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316	...	...	...	8	1
31	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	≤5	8	1
32	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316H	S31609	...	...	8	1
33	16Cr-12Ni-2Mo	Plate	SA-240	316H	S31609	...	...	8	1
34	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8	1
35	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8	1
36	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316H	S31609	...	...	8	1
37	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316H	S31609	...	...	8	1
38	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316H	S31609	...	...	8	1
39	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	1	...	8	1
40	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	3	...	8	1
41	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	4	...	8	1
42	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316H	S31609	...	...	8	1
43	16Cr-12Ni-2Mo	Fittings	SA-403	316H	S31609	...	...	8	1
44	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316H	S31609	WP-W	...	8	1
45	16Cr-12Ni-2Mo	Bar	SA-479	316H	S31609	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	70	25	800	NP	HA-4	G7
2	70	25	NP	800	HA-4	G7, G18
3	70	25	800	NP	HA-4	G7
4	70	25	800	NP	HA-4	G7
5	70	25	800	NP	HA-4	G7
6	70	30	800	800	HA-2	G7
7	70	30	800	800	HA-2	G7, G9, G10
8	70	30	800	800	HA-2	G7
9	70	30	800	800	HA-2	G7
10	75	30	800	800	HA-2	G7, G9
11	75	30	800	800	HA-2	G7, G9
12	75	30	800	800	HA-2	G7, G9, G10
13	75	30	800	NP	HA-2	G7
14	75	30	NP	800	HA-2	G7, G9, G18
15	75	30	800	NP	HA-2	G7
16	75	30	800	800	HA-2	G7, G9, G10
17	75	30	NP	800	HA-2	G7, G9, G18
18	75	30	800	NP	HA-2	G7
19	75	30	800	NP	HA-2	G7
20	75	30	800	NP	HA-2	G7
21	75	30	800	800	HA-2	G7, G9, G10
22	75	30	800	NP	HA-2	G7
23	75	30	NP	800	HA-2	G7
24	75	30	800	NP	HA-2	G7
25	75	30	800	NP	HA-2	G7
26	75	30	800	NP	HA-2	G7
27	75	30	NP	800	HA-2	G7, G9, G18
28	75	30	800	NP	HA-2	G7
29	75	30	800	NP	HA-2	G7
30	75	30	800	NP	HA-2	G7
31	75	30	800	NP	HA-2	G7
32	75	30	800	800	HA-2	G7
33	75	30	800	NP	HA-2	G7
34	75	30	800	NP	HA-2	G7
35	75	30	NP	800	HA-2	G7, G18
36	75	30	800	NP	HA-2	G7
37	75	30	800	800	HA-2	G7
38	75	30	NP	800	HA-2	G7, G18
39	75	30	800	NP	HA-2	G7
40	75	30	800	NP	HA-2	G7
41	75	30	800	NP	HA-2	G7
42	75	30	800	800	HA-2	G7
43	75	30	800	NP	HA-2	G7
44	75	30	800	NP	HA-2	G7
45	75	30	800	NP	HA-2	G7

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
2	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.2	11.0	...	...
3	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
4	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
5	16.7	...	16.7	...	16.7	15.7	14.8	14.0	13.7	13.5	13.2	12.9	...	...
6	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
7	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
8	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
9	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
10	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
11	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
12	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
13	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
14	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...
15	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
16	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
17	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...
18	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
19	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
20	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
21	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
22	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
23	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
24	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
25	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
26	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
27	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...
28	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
29	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
30	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
31	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
32	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
33	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
34	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
35	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...
36	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
37	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
38	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...
39	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
40	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
41	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
42	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
43	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
44	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
45	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
(23) 1	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316H	S31609	...	...	8	1
(23) 2	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316H	S31609	...	...	8	1
(23) 3	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X2CrNiMo17-12-2	...	...	≤3	8	1
(23) 4	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X5CrNiMo17-12-2	...	...	≤3	8	1
5	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...	>5	8	1
6	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316LN	S31653	...	...	8	1
7	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...	≤5	8	1
8	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316LN	S31653	...	...	8	1
9	16Cr-12Ni-2Mo-N	Plate	SA-240	316LN	S31653	...	...	8	1
10	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316LN	S31653	...	...	8	1
11	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316LN	S31653	...	...	8	1
12	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	1	...	8	1
13	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	3	...	8	1
14	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	4	...	8	1
15	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316LN	S31653	...	...	8	1
16	16Cr-12Ni-2Mo-N	Fittings	SA-403	316LN	S31653	...	...	8	1
17	16Cr-12Ni-2Mo-N	Wld. fittings	SA-403	316LN	S31653	WP-W	...	8	1
18	16Cr-12Ni-2Mo-N	Bar	SA-479	316LN	S31653	...	...	8	1
19	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316LN	S31653	...	...	8	1
20	16Cr-12Ni-2Mo-N	Wld. pipe	SA-813	TP316LN	S31653	...	...	8	1
21	16Cr-12Ni-2Mo-N	Wld. pipe	SA-814	TP316LN	S31653	...	...	8	1
22	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316N	S31651	...	≤5	8	1
23	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316N	S31651	...	≤5	8	1
24	16Cr-12Ni-2Mo-N	Plate	SA-240	316N	S31651	...	≤5	8	1
25	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651	...	...	8	1
26	16Cr-12Ni-2Mo-N	Wld. pipe	SA-312	TP316N	S31651	...	≤5	8	1
27	16Cr-12Ni-2Mo-N	Smls. pipe	SA-312	TP316N	S31651	...	≤5	8	1
28	16Cr-12Ni-2Mo-N	Wld. pipe	SA-312	TP316N	S31651	...	...	8	1
29	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	1	≤5	8	1
30	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	3	≤5	8	1
31	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	4	≤5	8	1
32	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316N	S31651	...	...	8	1
33	16Cr-12Ni-2Mo-N	Fittings	SA-403	316N	S31651	...	...	8	1
34	16Cr-12Ni-2Mo-N	Fittings	SA-403	316N	S31651	CR	...	8	1
35	16Cr-12Ni-2Mo-N	Wld. fittings	SA-403	316N	S31651	WP-W	...	8	1
36	16Cr-12Ni-2Mo-N	Wld. fittings	SA-403	316N	S31651	WP-W	...	8	1
37	16Cr-12Ni-2Mo-N	Wld. fittings	SA-403	316N	S31651	WP-WX	...	8	1
38	16Cr-12Ni-2Mo-N	Bar	SA-479	316N	S31651	...	...	8	1
39	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316N	S31651	...	...	8	1
40	16Cr-12Ni-2Mo-N	Wld. pipe	SA-813	TP316N	S31651	...	...	8	1
(23) 41	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMo17-11-2	...	...	≤3	8	1
(23) 42	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMo17-13-3	...	...	≤3	8	1
43	16Cr-12Ni-2Mo-N	Wld. pipe	SA-814	TP316N	S31651	...	...	8	1
44	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316N	S31651	...	≤5	8	1
45	17.5Cr-17.5Ni-5.3Si	Plate	SA-240	...	S30601	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	75	30	800	NP	HA-2	G7
2	75	30	800	NP	HA-2	G7
3	75	32	NP	800	HA-4	G7
4	75	32	NP	800	HA-2	G7
5	70	30	800	NP	HA-2	G7
6	70	30	800	NP	HA-2	G7
7	75	30	800	NP	HA-2	G7
8	75	30	800	NP	HA-2	G7
9	75	30	800	NP	HA-2	G7
10	75	30	800	NP	HA-2	G7
11	75	30	800	NP	HA-2	G7
12	75	30	800	NP	HA-2	G7
13	75	30	800	NP	HA-2	G7
14	75	30	800	NP	HA-2	G7
15	75	30	800	NP	HA-2	G7
16	75	30	800	NP	HA-2	G7
17	75	30	800	NP	HA-2	G7
18	75	30	800	NP	HA-2	G7
19	75	30	800	NP	HA-2	G7
20	75	30	800	NP	HA-2	G7
21	75	30	800	NP	HA-2	G7
22	80	35	800	NP	HA-2	G7
23	80	35	800	800	HA-2	G7
24	80	35	800	800	HA-2	G7
25	80	35	NP	800	HA-2	G7, G18
26	80	35	800	NP	HA-2	G7
27	80	35	800	800	HA-2	G7
28	80	35	NP	800	HA-2	G7, G18
29	80	35	800	NP	HA-2	G7
30	80	35	800	NP	HA-2	G7
31	80	35	800	NP	HA-2	G7
32	80	35	800	800	HA-2	G7
33	80	35	800	NP	HA-2	G7
34	80	35	NP	800	HA-2	G7, G18
35	80	35	800	NP	HA-2	G7
36	80	35	NP	800	HA-2	G7, G18
37	80	35	NP	800	HA-2	G7, G18
38	80	35	800	NP	HA-2	G7
39	80	35	800	NP	HA-2	G7
40	80	35	800	NP	HA-2	G7
41	84	41	NP	800	HA-2	G7
42	84	41	NP	800	HA-2	G7
43	80	35	800	NP	HA-2	G7
44	80	35	800	800	HA-2	G7
45	78	37	NP	500	HA-1	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
2	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...
3	21.3	21.3	21.3	21.3	21.3	20.1	18.8	17.9	17.6	17.3	16.9	16.6	...	...
4	21.3	21.3	21.3	21.3	21.3	20.5	19.1	18.1	17.7	17.4	17.2	16.9	...	...
5	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
6	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
7	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
8	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
9	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
10	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
11	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
12	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
13	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
14	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
15	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
16	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
17	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
18	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
19	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
20	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
21	20.0	...	20.0	...	20.0	18.9	17.5	16.5	16.0	15.6	15.2	14.8	...	...
22	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
23	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
24	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
25	19.8	...	19.8	...	19.8	19.8	18.9	17.9	17.4	17.0	16.7	16.3	...	...
26	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
27	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
28	19.8	...	19.8	...	19.8	19.8	18.9	17.9	17.4	17.0	16.7	16.3	...	...
29	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
30	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
31	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
32	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
33	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
34	19.8	...	19.8	...	19.8	19.8	18.9	17.9	17.4	17.0	16.7	16.3	...	...
35	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
36	19.8	...	19.8	...	19.8	19.8	18.9	17.9	17.4	17.0	16.7	16.3	...	...
37	19.8	...	19.8	...	19.8	19.8	18.9	17.9	17.4	17.0	16.7	16.3	...	...
38	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
39	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
40	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
41	27.3	27.3	27.3	27.2	26.5	25.1	23.8	22.3	21.7	21.2	20.6	20.1	...	...
42	27.3	27.3	27.3	27.2	26.5	25.1	23.8	22.3	21.7	21.2	20.6	20.1	...	...
43	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
44	23.3	...	23.3	...	23.3	23.3	22.3	21.0	20.5	20.0	19.6	19.2	...	...
45	24.7	...	24.7	...	24.4	22.2	20.4	...	...	...	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000	...	...	8	3
2	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000	...	...	8	3
3	18Cr-5Ni-3Mo	Smls. tube	SA-789	...	S31500	...	...	10H	1
4	18Cr-5Ni-3Mo	Wld. tube	SA-789	...	S31500	...	...	10H	1
5	18Cr-5Ni-3Mo	Smls. pipe	SA-790	...	S31500	...	...	10H	1
6	18Cr-5Ni-3Mo	Wld. pipe	SA-790	...	S31500	...	...	10H	1
7	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	>5	8	1
8	18Cr-8Ni	Forgings	SA-965	F304L	S30403	...	...	8	1
9	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	≤5	8	1
10	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...	...	8	1
11	18Cr-8Ni	Plate	SA-240	304L	S30403	...	...	8	1
12	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
13	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
14	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	...	...	8	1
15	18Cr-8Ni	Smls. pipe	SA-312	TP304L	S30403	...	...	8	1
16	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	...	...	8	1
17	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	1	...	8	1
18	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	3	...	8	1
19	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	4	...	8	1
20	18Cr-8Ni	Fittings	SA-403	304L	S30403	...	...	8	1
21	18Cr-8Ni	Fittings	SA-403	304L	S30403	WP-S	...	8	1
22	18Cr-8Ni	Wld. fittings	SA-403	304L	S30403	WP-W	...	8	1
23	18Cr-8Ni	Bar	SA-479	304L	S30403	...	...	8	1
24	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	8	1
25	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	8	1
26	18Cr-8Ni	Wld. pipe	SA-813	TP304L	S30403	...	...	8	1
27	18Cr-8Ni	Wld. pipe	SA-814	TP304L	S30403	...	...	8	1
28	18Cr-8Ni	Bar	SA/JIS G4303	SUS304L	...	...	...	8	1
29	18Cr-8Ni	Castings	SA-351	CF3	J92500	...	...	8	1
30	18Cr-8Ni	Cast pipe	SA-451	CPF3	J92500	...	...	8	1
31	18Cr-8Ni	Castings	SA-351	CF10	J92590	...	...	8	1
32	18Cr-8Ni	Castings	SA-351	CF8	J92600	...	...	8	1
33	18Cr-8Ni	Cast pipe	SA-451	CPF8	J92600	...	...	8	1
34	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	>5	8	1
(23) 35	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	≥8	8	1
36	18Cr-8Ni	Forgings	SA-965	F304	S30400	...	...	8	1
37	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	>5	8	1
38	18Cr-8Ni	Forgings	SA-965	F304H	S30409	...	...	8	1
(23) 39	18Cr-8Ni	Plate	SA/EN 10028-7	X2CrNi18-9	...	...	≤3	8	1
40	18Cr-8Ni	Plate	SA-240	302	S30200	...	...	8	1
41	18Cr-8Ni	Bar	SA-479	302	S30200	...	...	8	1
42	18Cr-8Ni	Bar	SA/JIS G4303	SUS302	...	...	...	8	1
43	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	≤5	8	1
44	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...	...	8	1
45	18Cr-8Ni	Plate	SA-240	304	S30400	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	100	55	NP	800	HA-6	G7
2	100	60	NP	800	HA-6	G7
3	92	64	NP	600	HA-5	G13
4	92	64	NP	600	HA-5	G13, G18
5	92	64	NP	600	HA-5	G13
6	92	64	NP	600	HA-5	G13, G18
7	65	25	800	800	HA-3	G7
8	65	25	NP	800	HA-3	G7
9	70	25	800	800	HA-3	G7
10	70	25	800	800	HA-3	G7
11	70	25	800	800	HA-3	G7
12	70	25	800	NP	HA-3	G7
13	70	25	NP	800	HA-3	G7, G18
14	70	25	800	NP	HA-3	G7
15	70	25	800	800	HA-3	G7
16	70	25	NP	800	HA-3	G7, G18
17	70	25	800	NP	HA-3	G7
18	70	25	800	NP	HA-3	G7
19	70	25	800	NP	HA-3	G7
20	70	25	800	NP	HA-3	G7
21	70	25	NP	800	HA-3	G7
22	70	25	800	NP	HA-3	G7
23	70	25	800	NP	HA-3	G7
24	70	25	800	NP	HA-3	G7
25	70	25	NP	800	HA-3	G7, G18
26	70	25	800	NP	HA-3	G7
27	70	25	800	NP	HA-3	G7
28	70	25	800	NP	HA-3	G7
29	70	30	800	800	HA-3	G7, G13
30	70	30	800	NP	HA-3	G7, G13
31	70	30	NP	800	HA-3	G7, G10, G13
32	70	30	800	800	HA-1	G7, G9, G10, G13
33	70	30	800	NP	HA-1	G7, G13
34	70	30	800	800	HA-1	G7, G9, G10
35	70	30	800	800	HA-1	G7, G9, G10, S2
36	70	30	800	800	HA-1	G7, G9, G10
37	70	30	800	800	HA-1	G7
38	70	30	800	800	HA-1	G7
39	72.5	29	NP	800	HA-3	G7
40	75	30	NP	800	HA-1	G7, G9
41	75	30	800	NP	HA-1	G7
42	75	30	800	NP	HA-1	G7
43	75	30	800	800	HA-1	G7, G9, G10
44	75	30	800	800	HA-1	G7, G9
45	75	30	800	800	HA-1	G7, G9, G10

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	33.3	...	32.6	...	30.4	29.1	27.2	25.9	25.4	25.0	24.5	24.0	...	...
2	33.3	...	32.6	...	30.4	29.1	28.4	27.8	27.3	26.8	26.2	25.4	...	...
3	30.7	...	29.6	...	28.5	28.3	28.3	28.3	...	...	...	...	...	...
4	26.1	...	25.2	...	24.2	24.0	24.0	24.0	...	...	...	...	...	...
5	30.7	...	29.6	...	28.5	28.3	28.3	28.3	...	...	...	...	...	...
6	26.1	...	25.2	...	24.2	24.0	24.0	24.0	...	...	...	...	...	...
7	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
8	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
9	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
10	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
11	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
12	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
13	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.3	11.1	...	...
14	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
15	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
16	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.3	11.1	...	...
17	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
18	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
19	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
20	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
21	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
22	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
23	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
24	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
25	14.2	...	14.2	...	14.2	13.4	12.5	11.9	11.7	11.4	11.3	11.1	...	...
26	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
27	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
28	16.7	...	16.7	...	16.7	15.8	14.7	14.0	13.7	13.5	13.3	13.0	...	...
29	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
30	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
31	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
32	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
33	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
34	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
35	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
36	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
37	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
38	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
39	19.3	...	19.3	...	19.3	18.3	17.1	16.2	15.9	15.7	15.4	15.1	14.9	14.7
40	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
41	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
42	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
43	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
44	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
45	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design/UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
2	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
3	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	...	...	8	1
4	18Cr-8Ni	Smls. pipe	SA-312	TP304	S30400	...	...	8	1
5	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	...	...	8	1
6	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	1	...	8	1
7	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	3	...	8	1
8	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	4	...	8	1
9	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	...	8	1
10	18Cr-8Ni	Fittings	SA-403	304	S30400	...	...	8	1
11	18Cr-8Ni	Fittings	SA-403	304	S30400	CR	...	8	1
12	18Cr-8Ni	Fittings	SA-403	304	S30400	WP-S	...	8	1
13	18Cr-8Ni	Wld. fittings	SA-403	304	S30400	WP-W	...	8	1
14	18Cr-8Ni	Wld. fittings	SA-403	304	S30400	WP-W	...	8	1
15	18Cr-8Ni	Wld. fittings	SA-403	304	S30400	WP-WX	...	8	1
16	18Cr-8Ni	Bar	SA-479	304	S30400	...	...	8	1
17	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	8	1
18	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	8	1
19	18Cr-8Ni	Wld. tube	SA-813	TP304	S30400	...	...	8	1
20	18Cr-8Ni	Wld. tube	SA-814	TP304	S30400	...	...	8	1
21	18Cr-8Ni	Bar	SA/JIS G4303	SUS304	...	...	...	8	1
22	18Cr-8Ni	Forgings	SA-182	P304H	S30409	...	≤5	8	1
23	18Cr-8Ni	Smls. tube	SA-213	TP304H	S30409	...	...	8	1
24	18Cr-8Ni	Plate	SA-240	304H	S30409	...	...	8	1
25	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
26	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
27	18Cr-8Ni	Wld. pipe	SA-312	TP304H	S30409	...	...	8	1
28	18Cr-8Ni	Smls. pipe	SA-312	TP304H	S30409	...	...	8	1
29	18Cr-8Ni	Wld. pipe	SA-312	TP304H	S30409	...	...	8	1
30	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	1	...	8	1
31	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	3	...	8	1
32	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	4	...	8	1
33	18Cr-8Ni	Smls. pipe	SA-376	TP304H	S30409	...	...	8	1
34	18Cr-8Ni	Fittings	SA-403	304H	S30409	...	...	8	1
35	18Cr-8Ni	Fittings	SA-403	304H	S30409	CR	...	8	1
36	18Cr-8Ni	Fittings	SA-403	304H	S30409	WP-S	...	8	1
37	18Cr-8Ni	Wld. fittings	SA-403	304H	S30409	WP-W	...	8	1
38	18Cr-8Ni	Wld. fittings	SA-403	304H	S30409	WP-W	...	8	1
39	18Cr-8Ni	Wld. fittings	SA-403	304H	S30409	WP-WX	...	8	1
40	18Cr-8Ni	Bar	SA-479	304H	S30409	...	...	8	1
41	18Cr-8Ni	Wld. tube	SA-813	TP304H	S30409	...	...	8	1
42	18Cr-8Ni	Wld. tube	SA-814	TP304H	S30409	...	...	8	1
43	18Cr-8Ni	Plate	SA/EN 10028-7	X5CrNi18-10	...	...	≤3	8	1
44	18Cr-8Ni	Castings	SA-351	CF3A	J92500	...	...	8	1
45	18Cr-8Ni	Cast pipe	SA-451	CPF3A	J92500	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	75	30	800	NP	HA-1	G7
2	75	30	NP	800	HA-1	G7, G9, G18
3	75	30	800	NP	HA-1	G7
4	75	30	800	800	HA-1	G7, G9, G10
5	75	30	NP	800	HA-1	G7, G9, G18
6	75	30	800	NP	HA-1	G7
7	75	30	800	NP	HA-1	G7
8	75	30	800	NP	HA-1	G7
9	75	30	800	800	HA-1	G7, G9, G10, S5
10	75	30	800	NP	HA-1	G7
11	75	30	NP	800	HA-1	G7, G18
12	75	30	NP	800	HA-1	G7
13	75	30	800	NP	HA-1	G7
14	75	30	NP	800	HA-1	G7, G18
15	75	30	NP	800	HA-1	G7, G18
16	75	30	800	NP	HA-1	G7
17	75	30	800	NP	HA-1	G7
18	75	30	NP	800	HA-1	G7, G9, G18
19	75	30	800	NP	HA-1	G7
20	75	30	800	NP	HA-1	G7
21	75	30	800	NP	HA-1	G7
22	75	30	800	800	HA-1	G7
23	75	30	800	800	HA-1	G7
24	75	30	800	NP	HA-1	G7
25	75	30	800	NP	HA-1	G7
26	75	30	NP	800	HA-1	G7, G18
27	75	30	800	NP	HA-1	G7
28	75	30	800	800	HA-1	G7
29	75	30	NP	800	HA-1	G7, G18
30	75	30	800	NP	HA-1	G7
31	75	30	800	NP	HA-1	G7
32	75	30	800	NP	HA-1	G7
33	75	30	800	800	HA-1	G7
34	75	30	800	NP	HA-1	G7
35	75	30	NP	800	HA-1	G7, G18
36	75	30	NP	800	HA-1	G7
37	75	30	800	NP	HA-1	G7
38	75	30	NP	800	HA-1	G7, G18
39	75	30	NP	800	HA-1	G7, G18
40	75	30	800	NP	HA-1	G7
41	75	30	800	NP	HA-1	G7
42	75	30	800	NP	HA-1	G7
43	75	31	NP	800	HA-1	G7
44	77	35	700	NP	HA-3	G7, G13
45	77	35	700	NP	HA-3	G7, G13

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
2	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
3	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
4	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
5	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
6	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
7	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
8	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
9	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
10	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
11	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
12	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
13	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
14	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
15	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
16	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
17	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
18	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
19	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
20	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
21	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
22	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
23	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
24	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
25	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
26	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
27	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
28	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
29	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
30	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
31	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
32	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
33	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
34	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
35	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
36	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
37	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
38	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
39	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...
40	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
41	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
42	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
43	20.7	...	20.7	...	20.5	18.9	17.7	16.8	16.5	16.1	15.8	15.4	...	...
44	23.3	...	23.3	...	22.7	21.7	20.4	19.3	18.9	18.5	...	...	...	...
45	23.3	...	23.3	...	22.7	21.7	20.4	19.3	18.9	18.5	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Castings	SA-351	CF8A	J92600	...	...	8	1
2	18Cr-8Ni	Cast pipe	SA-451	CPF8A	J92600	...	...	8	1
3	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...	>5	8	1
4	18Cr-8Ni-N	Forgings	SA-965	F304LN	S30453	...	...	8	1
5	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...	≤5	8	1
6	18Cr-8Ni-N	Smls. tube	SA-213	TP304LN	S30453	...	...	8	1
7	18Cr-8Ni-N	Plate	SA-240	304LN	S30453	...	...	8	1
8	18Cr-8Ni-N	Wld. tube	SA-249	TP304LN	S30453	...	...	8	1
9	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304LN	S30453	...	...	8	1
10	18Cr-8Ni-N	Wld. pipe	SA-358	304LN	S30453	1	...	8	1
11	18Cr-8Ni-N	Wld. pipe	SA-358	304LN	S30453	3	...	8	1
12	18Cr-8Ni-N	Wld. pipe	SA-358	304LN	S30453	4	...	8	1
13	18Cr-8Ni-N	Smls. pipe	SA-376	TP304LN	S30453	...	...	8	1
14	18Cr-8Ni-N	Fittings	SA-403	304LN	S30453	...	...	8	1
15	18Cr-8Ni-N	Wld. fittings	SA-403	304LN	S30453	WP-W	...	8	1
16	18Cr-8Ni-N	Bar	SA-479	304LN	S30453	...	...	8	1
17	18Cr-8Ni-N	Wld. tube	SA-688	TP304LN	S30453	...	...	8	1
18	18Cr-8Ni-N	Wld. tube	SA-813	TP304LN	S30453	...	...	8	1
19	18Cr-8Ni-N	Wld. tube	SA-814	TP304LN	S30453	...	...	8	1
20	18Cr-8Ni-N	Forgings	SA-182	F304N	S30451	...	...	8	1
21	18Cr-8Ni-N	Smls. tube	SA-213	TP304N	S30451	...	...	8	1
22	18Cr-8Ni-N	Plate	SA-240	304N	S30451	...	...	8	1
23	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
24	18Cr-8Ni-N	Wld. pipe	SA-312	TP304N	S30451	...	...	8	1
25	18Cr-8Ni-N	Smls. pipe	SA-312	TP304N	S30451	...	...	8	1
26	18Cr-8Ni-N	Wld. pipe	SA-312	TP304N	S30451	...	...	8	1
27	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	1	...	8	1
28	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	3	...	8	1
29	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	4	...	8	1
30	18Cr-8Ni-N	Smls. pipe	SA-376	TP304N	S30451	...	...	8	1
31	18Cr-8Ni-N	Fittings	SA-403	304N	S30451	...	...	8	1
32	18Cr-8Ni-N	Fittings	SA-403	304N	S30451	CR	...	8	1
33	18Cr-8Ni-N	Wld. fittings	SA-403	304N	S30451	WP-W	...	8	1
34	18Cr-8Ni-N	Wld. fittings	SA-403	304N	S30451	WP-W	...	8	1
35	18Cr-8Ni-N	Wld. fittings	SA-403	304N	S30451	WP-WX	...	8	1
36	18Cr-8Ni-N	Bar	SA-479	304N	S30451	...	...	8	1
37	18Cr-8Ni-N	Wld. tube	SA-688	TP304N	S30451	...	...	8	1
38	18Cr-8Ni-N	Wld. pipe	SA-813	TP304N	S30451	...	...	8	1
39	18Cr-8Ni-N	Wld. pipe	SA-814	TP304N	S30451	...	...	8	1
40	18Cr-8Ni-N	Forgings	SA-965	F304N	S30451	...	...	8	1
(23) 41	18Cr-8Ni-N	Plate	SA/EN 10028-7	X2CrNiN18-10	...	...	≤3	8	1
(23) 42	18Cr-8Ni-N	Plate	SA/EN 10028-7	X5CrNiN19-9	...	...	≤3	8	1
43	18Cr-8Ni-4Si-N	Bar	SA-479	...	S21800	...	...	8	3
44	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710	...	...	8	1
45	18Cr-10Ni-Cb	Cast pipe	SA-451	CPF8C	J92710	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	77	35	700	NP	HA-1	G7, G13
2	77	35	700	NP	HA-1	G7, G13
3	70	30	800	NP	HA-1	G7
4	70	30	800	NP	HA-1	G7
5	75	30	800	NP	HA-1	G7
6	75	30	800	NP	HA-1	G7
7	75	30	800	NP	HA-1	G7
8	75	30	800	NP	HA-1	G7
9	75	30	800	NP	HA-1	G7
10	75	30	800	NP	HA-1	G7
11	75	30	800	NP	HA-1	G7
12	75	30	800	NP	HA-1	G7
13	75	30	800	NP	HA-1	G7
14	75	30	800	NP	HA-1	G7
15	75	30	800	NP	HA-1	G7
16	75	30	800	NP	HA-1	G7
17	75	30	800	NP	HA-1	G7
18	75	30	800	NP	HA-1	G7
19	75	30	800	NP	HA-1	G7
20	80	35	800	NP	HA-1	G7
21	80	35	800	800	HA-1	G7
22	80	35	800	800	HA-1	G7
23	80	35	NP	800	HA-1	G7, G18
24	80	35	800	NP	HA-1	G7
25	80	35	800	800	HA-1	G7
26	80	35	NP	800	HA-1	G7, G18
27	80	35	800	NP	HA-1	G7
28	80	35	800	NP	HA-1	G7
29	80	35	800	NP	HA-1	G7
30	80	35	800	800	HA-1	G7
31	80	35	800	NP	HA-1	G7
32	80	35	NP	800	HA-1	G7, G18
33	80	35	800	NP	HA-1	G7
34	80	35	NP	800	HA-1	G7, G18
35	80	35	NP	800	HA-1	G7, G18
36	80	35	800	NP	HA-1	G7
37	80	35	800	NP	HA-1	G7
38	80	35	800	NP	HA-1	G7
39	80	35	800	NP	HA-1	G7
40	80	35	800	800	HA-1	G7
41	80	39	NP	800	HA-1	G7
42	80	39	NP	800	HA-1	G7
43	95	50	800	NP	HA-6	...
44	70	30	800	800	HA-2	G7, G9, G13
45	70	30	800	NP	HA-2	G7, G13

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	23.3	...	23.3	...	22.7	21.7	20.4	19.3	18.9	18.5	...	...	...	...
2	23.3	...	23.3	...	22.7	21.7	20.4	19.3	18.9	18.5	...	...	...	...
3	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
4	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
5	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
6	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
7	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
8	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
9	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
10	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
11	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
12	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
13	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
14	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
15	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
16	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
17	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
18	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
19	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
20	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
21	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
22	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
23	19.8	...	19.8	...	19.2	17.3	16.0	15.2	14.9	14.6	14.4	14.1	...	...
24	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
25	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
26	19.8	...	19.8	...	19.2	17.3	16.0	15.2	14.9	14.6	14.4	14.1	...	...
27	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
28	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
29	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
30	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
31	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
32	19.8	...	19.8	...	19.2	17.3	16.0	15.2	14.9	14.6	14.4	14.1	...	...
33	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
34	19.8	...	19.8	...	19.2	17.3	16.0	15.2	14.9	14.6	14.4	14.1	...	...
35	19.8	...	19.8	...	19.2	17.3	16.0	15.2	14.9	14.6	14.4	14.1	...	...
36	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
37	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
38	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
39	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
40	23.3	...	23.3	...	22.5	20.3	18.9	17.9	17.5	17.2	16.9	16.6	...	...
41	26.0	25.9	25.1	24.4	23.6	22.7	22.4	21.6	21.2	20.7	20.3	19.8	...	(23)
42	26.0	26.0	26.0	25.9	25.2	22.8	21.1	20.1	19.6	19.3	18.9	18.6	...	(23)
43	31.7	...	25.9	...	22.1	19.8	18.4	17.6	17.3	17.1	16.9	16.8	...	...
44	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
45	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...	>5	8	1
2	18Cr-10Ni-Cb	Forgings	SA-965	F347	S34700	...	...	8	1
3	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	>5	8	1
4	18Cr-10Ni-Cb	Forgings	SA-965	F347H	S34709	...	...	8	1
5	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	>5	8	1
6	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	>5	8	1
7	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...	≤5	8	1
8	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347	S34700	...	...	8	1
9	18Cr-10Ni-Cb	Plate	SA-240	347	S34700	...	...	8	1
10	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8	1
11	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8	1
12	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347	S34700	...	...	8	1
13	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347	S34700	...	...	8	1
14	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347	S34700	...	...	8	1
15	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	1	...	8	1
16	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	3	...	8	1
17	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	4	...	8	1
18	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347	S34700	...	...	8	1
19	18Cr-10Ni-Cb	Fittings	SA-403	347	S34700	...	...	8	1
20	18Cr-10Ni-Cb	Fittings	SA-403	347	S34700	CR	...	8	1
21	18Cr-10Ni-Cb	Fittings	SA-403	347	S34700	WP-S	...	8	1
22	18Cr-10Ni-Cb	Wld. fittings	SA-403	347	S34700	WP-W	...	8	1
23	18Cr-10Ni-Cb	Wld. fittings	SA-403	347	S34700	WP-W	...	8	1
24	18Cr-10Ni-Cb	Wld. fittings	SA-403	347	S34700	WP-WX	...	8	1
25	18Cr-10Ni-Cb	Bar	SA-479	347	S34700	...	...	8	1
26	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347	S34700	...	...	8	1
27	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP347	S34700	...	...	8	1
28	18Cr-10Ni-Cb	Bar	SA/JIS G4303	SUS347	...	...	...	8	1
29	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	≤5	8	1
30	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347H	S34709	...	...	8	1
31	18Cr-10Ni-Cb	Plate	SA-240	347H	S34709	...	...	8	1
32	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8	1
33	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8	1
34	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347H	S34709	...	...	8	1
35	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347H	S34709	...	...	8	1
36	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347H	S34709	...	...	8	1
37	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347H	S34709	...	...	8	1
38	18Cr-10Ni-Cb	Fittings	SA-403	347H	S34709	...	...	8	1
39	18Cr-10Ni-Cb	Fittings	SA-403	347H	S34709	CR	...	8	1
40	18Cr-10Ni-Cb	Fittings	SA-403	347H	S34709	WP-S	...	8	1
41	18Cr-10Ni-Cb	Wld. fittings	SA-403	347H	S34709	WP-W	...	8	1
42	18Cr-10Ni-Cb	Wld. fittings	SA-403	347H	S34709	WP-W	...	8	1
43	18Cr-10Ni-Cb	Wld. fittings	SA-403	347H	S34709	WP-WX	...	8	1
44	18Cr-10Ni-Cb	Bar	SA-479	347H	S34709	...	...	8	1
45	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347H	S34709	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	70	30	800	800	HA-2	G7, G9
2	70	30	800	800	HA-2	G7, G9
3	70	30	800	800	HA-2	G7
4	70	30	800	800	HA-2	G7, G9
5	70	30	NP	800	HA-2	G7, G9
6	70	30	NP	800	HA-2	G7
7	75	30	800	800	HA-2	G7, G9
8	75	30	800	800	HA-2	G7, G9
9	75	30	800	800	HA-2	G7, G9
10	75	30	800	NP	HA-2	G7
11	75	30	NP	800	HA-2	G7, G9, G18
12	75	30	800	NP	HA-2	G7
13	75	30	800	800	HA-2	G7, G9
14	75	30	NP	800	HA-2	G7, G9, G18
15	75	30	800	NP	HA-2	G7
16	75	30	800	NP	HA-2	G7
17	75	30	800	NP	HA-2	G7
18	75	30	800	800	HA-2	G7, G9
19	75	30	800	NP	HA-2	G7
20	75	30	NP	800	HA-2	G7, G18
21	75	30	NP	800	HA-2	G7
22	75	30	800	NP	HA-2	G7
23	75	30	NP	800	HA-2	G7, G18
24	75	30	NP	800	HA-2	G7, G18
25	75	30	800	NP	HA-2	G7
26	75	30	800	NP	HA-2	G7
27	75	30	800	NP	HA-2	G7
28	75	30	800	NP	HA-2	G7
29	75	30	800	800	HA-2	G7
30	75	30	800	800	HA-2	G7
31	75	30	800	800	HA-2	G7
32	75	30	800	NP	HA-2	G7
33	75	30	NP	800	HA-2	G7, G18
34	75	30	800	NP	HA-2	G7
35	75	30	800	800	HA-2	G7
36	75	30	NP	800	HA-2	G7, G18
37	75	30	800	800	HA-2	G7
38	75	30	800	NP	HA-2	G7
39	75	30	NP	800	HA-2	G7, G18
40	75	30	NP	800	HA-2	G7
41	75	30	800	NP	HA-2	G7
42	75	30	NP	800	HA-2	G7, G18
43	75	30	NP	800	HA-2	G7, G18
44	75	30	800	NP	HA-2	G7
45	75	30	800	NP	HA-2	G7

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
2	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
3	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
4	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
5	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
6	20.0	...	20.0	...	20.0	19.3	18.7	18.4	18.3	18.3	18.3	18.3	...	...
7	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
8	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
9	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
10	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
11	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
12	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
13	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
14	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
15	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
16	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
17	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
18	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
19	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
20	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
21	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
22	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
23	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
24	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
25	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
26	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
27	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
28	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
29	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
30	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
31	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
32	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
33	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
34	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
35	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
36	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
37	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
38	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
39	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
40	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
41	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
42	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
43	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
44	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
45	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP347H	S34709	...	...	8	1
2	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	≤5	8	1
3	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348	S34800	...	...	8	1
4	18Cr-10Ni-Cb	Plate	SA-240	348	S34800	...	...	8	1
5	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
6	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
7	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348	S34800	...	...	8	1
8	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP348	S34800	...	...	8	1
9	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348	S34800	...	...	8	1
10	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	1	...	8	1
11	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	3	...	8	1
12	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	4	...	8	1
13	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP348	S34800	...	...	8	1
14	18Cr-10Ni-Cb	Fittings	SA-403	348	S34800	...	...	8	1
15	18Cr-10Ni-Cb	Fittings	SA-403	348	S34800	CR	...	8	1
16	18Cr-10Ni-Cb	Fittings	SA-403	348	S34800	WP-S	...	8	1
17	18Cr-10Ni-Cb	Wld. fittings	SA-403	348	S34800	WP-W	...	8	1
18	18Cr-10Ni-Cb	Wld. fittings	SA-403	348	S34800	WP-W	...	8	1
19	18Cr-10Ni-Cb	Wld. fittings	SA-403	348	S34800	WP-WX	...	8	1
20	18Cr-10Ni-Cb	Bar	SA-479	348	S34800	...	...	8	1
21	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348	S34800	...	...	8	1
22	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348	S34800	...	...	8	1
23	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	≤5	8	1
24	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348H	S34809	...	...	8	1
25	18Cr-10Ni-Cb	Plate	SA-240	348H	S34809	...	...	8	1
26	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
27	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
28	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348H	S34809	...	...	8	1
29	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP348H	S34809	...	...	8	1
30	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348H	S34809	...	...	8	1
31	18Cr-10Ni-Cb	Fittings	SA-403	348H	S34809	...	...	8	1
32	18Cr-10Ni-Cb	Fittings	SA-403	348H	S34809	CR	...	8	1
33	18Cr-10Ni-Cb	Fittings	SA-403	348H	S34809	WP-S	...	8	1
34	18Cr-10Ni-Cb	Wld. fittings	SA-403	348H	S34809	WP-W	...	8	1
35	18Cr-10Ni-Cb	Wld. fittings	SA-403	348H	S34809	WP-W	...	8	1
36	18Cr-10Ni-Cb	Wld. fittings	SA-403	348H	S34809	WP-WX	...	8	1
37	18Cr-10Ni-Cb	Bar	SA-479	348H	S34809	...	...	8	1
38	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348H	S34809	...	...	8	1
39	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348H	S34809	...	...	8	1
40	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	> ³ / ₈	8	1
41	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	> ³ / ₈	8	1
42	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	> ³ / ₁₆	8	1
43	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	> ³ / ₈	8	1
44	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	>5	8	1
45	18Cr-10Ni-Ti	Forgings	SA-965	F321	S32100	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	75	30	800	NP	HA-2	G7
2	75	30	800	800	HA-2	G7, G9
3	75	30	800	800	HA-2	G7, G9
4	75	30	800	800	HA-2	G7, G9
5	75	30	800	NP	HA-2	G7
6	75	30	NP	800	HA-2	G7, G9, G18
7	75	30	800	NP	HA-2	G7
8	75	30	800	800	HA-2	G7, G9
9	75	30	NP	800	HA-2	G7, G9, G18
10	75	30	800	NP	HA-2	G7
11	75	30	800	NP	HA-2	G7
12	75	30	800	NP	HA-2	G7
13	75	30	800	800	HA-2	G7, G9
14	75	30	800	NP	HA-2	G7
15	75	30	NP	800	HA-2	G7, G18
16	75	30	NP	800	HA-2	G7
17	75	30	800	NP	HA-2	G7
18	75	30	NP	800	HA-2	G7, G18
19	75	30	NP	800	HA-2	G7, G18
20	75	30	800	NP	HA-2	G7
21	75	30	800	NP	HA-2	G7
22	75	30	800	NP	HA-2	G7
23	75	30	800	800	HA-2	G7
24	75	30	800	800	HA-2	G7
25	75	30	800	NP	HA-2	G7
26	75	30	800	NP	HA-2	G7
27	75	30	NP	800	HA-2	G7, G18
28	75	30	800	NP	HA-2	G7
29	75	30	800	800	HA-2	G7
30	75	30	NP	800	HA-2	G7, G18
31	75	30	800	NP	HA-2	G7
32	75	30	NP	800	HA-2	G7, G18
33	75	30	NP	800	HA-2	G7
34	75	30	800	NP	HA-2	G7
35	75	30	NP	800	HA-2	G7, G18
36	75	30	NP	800	HA-2	G7, G18
37	75	30	800	NP	HA-2	G7
38	75	30	800	NP	HA-2	G7
39	75	30	800	NP	HA-2	G7
40	70	25	NP	800	HA-2	G7, G9
41	70	25	800	800	HA-2	G7, G9
42	70	25	NP	800	HA-2	G7
43	70	25	800	800	HA-2	G7
44	70	30	800	800	HA-2	G7, G9
45	70	30	800	800	HA-2	G7, G9

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
2	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
3	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
4	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
5	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
6	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
7	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
8	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
9	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
10	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
11	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
12	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
13	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
14	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
15	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
16	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
17	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
18	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
19	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
20	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
21	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
22	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
23	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
24	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
25	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
26	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
27	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
28	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
29	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
30	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
31	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
32	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
33	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
34	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
35	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
36	17.0	...	17.0	...	17.0	17.0	17.0	16.4	16.1	15.9	15.7	15.6	...	...
37	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
38	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
39	20.0	...	20.0	...	20.0	20.0	20.0	19.3	19.0	18.7	18.5	18.3	...	...
40	16.7	...	16.7	...	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	...	...
41	16.7	...	16.7	...	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	...	...
42	16.7	...	16.7	...	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	...	...
43	16.7	...	16.7	...	16.7	16.7	16.1	15.2	14.9	14.6	14.3	14.1	...	...
44	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
45	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
(23)	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	>5	8	1
	18Cr-10Ni-Ti	Forgings	SA-965	F321H	S32109	...	...	8	1
	18Cr-10Ni-Ti	Plate	SA/EN 10028-7	X6CrNiTi181-10	...	...	≤ 3	8	1
	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	≤ 5	8	1
	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...	...	8	1
	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...	...	8	1
	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
11	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
12	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	1	...	8	1
13	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	3	...	8	1
14	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	4	...	8	1
15	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$\leq \frac{3}{8}$	8	1
16	18Cr-10Ni-Ti	Fittings	SA-403	321	S32100	...	...	8	1
17	18Cr-10Ni-Ti	Fittings	SA-403	321	S32100	CR	...	8	1
18	18Cr-10Ni-Ti	Fittings	SA-403	321	S32100	WP-S	...	8	1
19	18Cr-10Ni-Ti	Wld. fittings	SA-403	321	S32100	WP-W	...	8	1
20	18Cr-10Ni-Ti	Wld. fittings	SA-403	321	S32100	WP-W	...	8	1
21	18Cr-10Ni-Ti	Wld. fittings	SA-403	321	S32100	WP-WX	...	8	1
22	18Cr-10Ni-Ti	Bar	SA-479	321	S32100	...	...	8	1
23	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321	S32100	...	...	8	1
24	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321	S32100	...	...	8	1
25	18Cr-10Ni-Ti	Bar	SA/JIS G4303	SUS321	...	...	...	8	1
26	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	≤ 5	8	1
27	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321H	S32109	...	...	8	1
28	18Cr-10Ni-Ti	Plate	SA-240	321H	S32109	...	...	8	1
29	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
30	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
31	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	$\leq \frac{3}{16}$	8	1
32	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	$\leq \frac{3}{16}$	8	1
33	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	$\leq \frac{3}{16}$	8	1
34	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	$\leq \frac{3}{8}$	8	1
35	18Cr-10Ni-Ti	Fittings	SA-403	321H	S32109	...	...	8	1
36	18Cr-10Ni-Ti	Fittings	SA-403	321H	S32109	CR	...	8	1
37	18Cr-10Ni-Ti	Fittings	SA-403	321H	S32109	WP-S	...	8	1
38	18Cr-10Ni-Ti	Wld. fittings	SA-403	321H	S32109	WP-W	...	8	1
39	18Cr-10Ni-Ti	Wld. fittings	SA-403	321H	S32109	WP-W	...	8	1
40	18Cr-10Ni-Ti	Wld. fittings	SA-403	321H	S32109	WP-WX	...	8	1
41	18Cr-10Ni-Ti	Bar	SA-479	321H	S32109	...	...	8	1
42	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321H	S32109	...	...	8	1
43	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321H	S32109	...	...	8	1
44	18Cr-11Ni	Plate	SA-240	305	S30500	...	...	8	1
(23) 45	18Cr-12Ni-2Mo	Castings	SA-351	CF3M	J92800	...	...	8	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	70	30	800	800	HA-2	G7
2	70	30	800	800	HA-2	G7, G9
3	73	29	NP	800	HA-2	G7
4	75	30	800	800	HA-2	G7, G9
5	75	30	800	800	HA-2	G7, G9
6	75	30	800	800	HA-2	G7, G9
7	75	30	800	NP	HA-2	G7
8	75	30	NP	800	HA-2	G7, G9, G18
9	75	30	800	NP	HA-2	G7
10	75	30	800	800	HA-2	G7, G9
11	75	30	NP	800	HA-2	G7, G9, G18
12	75	30	800	NP	HA-2	G7
13	75	30	800	NP	HA-2	G7
14	75	30	800	NP	HA-2	G7
15	75	30	800	800	HA-2	G7, G9
16	75	30	800	NP	HA-2	G7
17	75	30	NP	800	HA-2	G7, G18
18	75	30	NP	800	HA-2	G7
19	75	30	800	NP	HA-2	G7
20	75	30	NP	800	HA-2	G7, G18
21	75	30	NP	800	HA-2	G7, G18
22	75	30	800	NP	HA-2	G7
23	75	30	800	NP	HA-2	G7
24	75	30	800	NP	HA-2	G7
25	75	30	800	NP	HA-2	G7
26	75	30	800	800	HA-2	G7
27	75	30	800	800	HA-2	G7
28	75	30	800	800	HA-2	G7
29	75	30	800	NP	HA-2	G7
30	75	30	NP	800	HA-2	G7, G18
31	75	30	800	NP	HA-2	G7
32	75	30	800	800	HA-2	G7
33	75	30	NP	800	HA-2	G7, G18
34	75	30	800	800	HA-2	G7
35	75	30	800	NP	HA-2	G7
36	75	30	NP	800	HA-2	G7, G18
37	75	30	NP	800	HA-2	G7
38	75	30	800	NP	HA-2	G7
39	75	30	NP	800	HA-2	G7, G18
40	75	30	NP	800	HA-2	G7, G18
41	75	30	800	NP	HA-2	G7
42	75	30	800	NP	HA-2	G7
43	75	30	800	NP	HA-2	G7
44	75	30	800	NP	HA-1	G7
45	70	30	800	NP	HA-4	G7, G13

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
2	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
3	19.3	19.3	19.3	19.3	19.3	19.3	18.7	17.6	17.3	16.9	16.7	16.4	...	...
4	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
5	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
6	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
7	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
8	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
9	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
10	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
11	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
12	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
13	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
14	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
15	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
16	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
17	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
18	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
19	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
20	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
21	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
22	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
23	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
24	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
25	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
26	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
27	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
28	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
29	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
30	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
31	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
32	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
33	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
34	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
35	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
36	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
37	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
38	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
39	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
40	17.0	...	17.0	...	17.0	17.0	16.4	15.5	15.2	14.9	14.6	14.4	...	...
41	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
42	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
43	20.0	...	20.0	...	20.0	20.0	19.3	18.3	17.9	17.5	17.2	16.9	...	...
44	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...
45	20.0	...	20.0	...	20.0	19.2	17.9	17.0	16.6	16.3	16.0	15.8	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
(23) 1	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF3M	J92800	...	...	8	1
(23) 2	18Cr-12Ni-2Mo	Castings	SA-351	CF8M	J92900	...	...	8	1
(23) 3	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF8M	J92900	...	...	8	1
4	18Cr-13Ni-3Mo	Plate	SA-240	317	S31700	...	≤5	8	1
5	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	8	1
6	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	8	1
7	18Cr-13Ni-3Mo	Smls. & wld. pipe	SA-312	TP317	S31700	...	...	8	1
8	18Cr-13Ni-3Mo	Smls. pipe	SA-312	TP317	S31700	...	≤5	8	1
9	18Cr-13Ni-3Mo	Wld. pipe	SA-312	TP317	S31700	...	≤5	8	1
10	18Cr-13Ni-3Mo	Fittings	SA-403	317	S31700	WP-S	...	8	1
11	18Cr-13Ni-3Mo	Plate	SA-240	317L	S31703	...	...	8	1
12	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-S	...	8	1
13	18Cr-18Ni-2Si	Smls. tube	SA-213	XM-15	S38100	...	≤5	8	1
14	18Cr-18Ni-2Si	Plate	SA-240	XM-15	S38100	...	≤5	8	1
15	18Cr-18Ni-2Si	Wld. tube	SA-249	TPXM-15	S38100	...	≤5	8	1
16	18Cr-18Ni-2Si	Smls. pipe	SA-312	TPXM-15	S38100	...	≤5	8	1
17	18Cr-18Ni-2Si	Wld. pipe	SA-312	TPXM-15	S38100	...	≤5	8	1
18	20Cr-10Ni	Bar	SA-479	ER308	S30880	...	...	8	1
19	21Cr-6Ni-9Mn	Forgings	SA-182	FXM-11	S21904	...	...	8	3
20	21Cr-6Ni-9Mn	Wld. pipe	SA-312	TPXM-11	S21904	...	...	8	3
21	21Cr-6Ni-9Mn	Smls. pipe	SA-312	TPXM-11	S21904	...	...	8	3
22	21Cr-6Ni-9Mn	Wld. pipe	SA-312	TPXM-11	S21904	...	...	8	3
23	21Cr-6Ni-9Mn	Plate	SA-666	XM-11	S21904	...	...	8	3
24	21Cr-6Ni-9Mn	Forgings	SA-965	FXM-11	S21904	...	...	8	3
25	22Cr-5Ni-3Mo-N	Forgings	SA-182	F51	S31803	...	...	10H	1
26	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...	...	10H	1
27	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S31803	...	...	10H	1
28	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S31803	...	...	10H	1
29	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S31803	...	...	10H	1
30	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S31803	...	...	10H	1
(23) 31	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S32205	...	...	10H	1
(23) 32	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S32205	...	...	10H	1
(23) 33	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S32205	...	...	10H	1
(23) 34	22Cr-5Ni-3Mo-N	Forgings	SA-182	F60	S32205	...	...	10H	1
(23) 35	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S32205	...	O.D. ≤ 8	10H	1
(23) 36	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S32205	...	O.D. ≤ 8	10H	1
37	22Cr-13Ni-5Mn	Forgings	SA-182	FXM-19	S20910	...	...	8	3
38	22Cr-13Ni-5Mn	Plate	SA-240	XM-19	S20910	...	...	8	3
39	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...	...	8	3
40	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...	...	8	3
41	22Cr-13Ni-5Mn	Wld. pipe	SA-312	TPXM-19	S20910	...	...	8	3
42	22Cr-13Ni-5Mn	Smls. pipe	SA-312	TPXM-19	S20910	...	...	8	3
43	22Cr-13Ni-5Mn	Wld. pipe	SA-312	TPXM-19	S20910	...	...	8	3
44	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	1	...	8	3
45	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	3	...	8	3

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	70	30	800	NP	HA-4	G7, G13
2	70	30	800	800	HA-2	G7, G9, G10, G13
3	70	30	800	NP	HA-2	G7, G13
4	75	30	NP	800	HA-2	G7, G9
5	75	30	800	NP	HA-2	G7
6	75	30	NP	800	HA-2	G7, G9, G18
7	75	30	800	NP	HA-2	G7
8	75	30	NP	800	HA-2	G7, G9
9	75	30	NP	800	HA-2	G7, G9, G18
10	75	30	NP	800	HA-2	G7
11	75	30	NP	800	HA-4	G7
12	75	30	NP	800	HA-4	G7
13	75	30	NP	800	HA-2	G7, G9
14	75	30	NP	800	HA-2	G7, G9
15	75	30	NP	800	HA-2	G7, G9, G18
16	75	30	NP	800	HA-2	G7, G9
17	75	30	NP	800	HA-2	G7, G9, G18
18	75	30	800	NP	HA-2	G7
19	90	50	600	600	HA-6	G7
20	90	50	600	NP	HA-6	G7
21	90	50	600	600	HA-6	G7
22	90	50	NP	600	HA-6	G7, G18
23	90	50	600	600	HA-6	G7
24	90	50	600	600	HA-6	G7
25	90	65	NP	600	HA-5	G13
26	90	65	NP	600	HA-5	G13
27	90	65	NP	600	HA-5	G13
28	90	65	NP	600	HA-5	G13, G18
29	90	65	NP	600	HA-5	G13
30	90	65	NP	600	HA-5	G13, G18
31	95	65	NP	600	HA-5	G7
32	95	65	NP	600	HA-5	G7
33	95	65	NP	600	HA-5	G7
34	95	70	NP	600	HA-5	G7
35	95	70	NP	600	HA-5	G7
36	95	70	NP	600	HA-5	G7
37	100	55	800	800	HA-6	G7
38	100	55	800	800	HA-6	G7
39	100	55	800	NP	HA-6	G7
40	100	55	NP	800	HA-6	G7, G18
41	100	55	800	NP	HA-6	G7
42	100	55	800	800	HA-6	G7
43	100	55	NP	800	HA-6	G7, G18
44	100	55	800	NP	HA-6	G7
45	100	55	800	NP	HA-6	G7

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	400	500	600	650	700	750	800	850	900	
1	20.0	...	20.0	...	20.0	19.2	17.9	17.0	16.6	16.3	16.0	15.8	...	...	(23)
2	20.0	...	20.0	...	20.0	19.2	17.9	17.0	16.6	16.3	16.0	15.8	...	...	(23)
3	20.0	...	20.0	...	20.0	19.2	17.9	17.0	16.6	16.3	16.0	15.8	...	...	(23)
4	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...	
5	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...	
6	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...	
7	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...	
8	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...	
9	17.0	...	17.0	...	17.0	16.4	15.3	14.5	14.1	13.9	13.7	13.5	...	...	
10	20.0	...	20.0	...	20.0	19.3	18.0	17.0	16.6	16.3	16.1	15.9	...	...	
11	20.0	...	20.0	...	20.0	18.9	17.7	16.9	16.5	16.2	15.8	15.5	...	...	
12	20.0	...	20.0	...	20.0	18.9	17.7	16.9	16.5	16.2	15.8	15.5	...	...	
13	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...	
14	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...	
15	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...	
16	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...	
17	17.0	...	17.0	...	17.0	15.8	14.8	14.1	13.8	13.5	13.2	12.9	...	...	
18	20.0	...	20.0	...	20.0	18.6	17.5	16.6	16.2	15.8	15.5	15.2	...	...	
19	30.0	...	30.0	...	28.0	26.4	24.4	23.1	...	...	...	...	...	...	
20	30.0	...	30.0	...	28.0	26.4	24.4	23.1	...	...	...	...	...	...	
21	30.0	...	30.0	...	28.0	26.4	24.4	23.1	...	...	...	...	...	...	
22	25.5	...	25.5	...	23.8	22.5	20.7	19.7	...	...	...	...	...	...	
23	30.0	...	30.0	...	28.0	26.4	24.4	23.1	...	...	...	...	...	...	
24	30.0	...	30.0	...	28.0	26.4	24.4	23.1	...	...	...	...	...	...	
25	30.0	...	30.0	...	28.9	27.9	27.2	26.9	...	...	...	...	...	...	
26	30.0	...	30.0	...	28.9	27.9	27.2	26.9	...	...	...	...	...	...	
27	30.0	...	30.0	...	28.9	27.9	27.2	26.9	...	...	...	...	...	...	
28	25.5	...	25.5	...	24.6	23.7	23.1	22.9	...	...	...	...	...	...	
29	30.0	...	30.0	...	28.9	27.9	27.2	26.9	...	...	...	...	...	...	
30	25.5	...	25.5	...	24.6	23.7	23.1	22.9	...	...	...	...	...	...	
31	31.7	31.7	31.7	31.1	30.6	29.4	28.7	28.4	28.3	...	...	...	...	...	(23)
32	31.7	31.7	31.7	31.1	30.6	29.4	28.7	28.4	28.3	...	...	...	...	...	(23)
33	26.9	26.9	26.9	26.4	26.0	25.0	24.4	24.1	24.1	...	...	...	...	...	(23)
34	31.7	31.7	31.7	31.1	30.6	29.4	28.7	28.4	28.3	...	...	...	...	...	(23)
35	31.7	31.7	31.7	31.1	30.6	29.4	28.7	28.4	28.3	...	...	...	...	...	(23)
36	26.9	26.9	26.9	26.4	26.0	25.0	24.4	24.1	24.1	...	...	...	...	...	(23)
37	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	
38	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	
39	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	
40	28.3	...	26.7	...	24.5	23.1	22.0	21.2	20.9	20.6	20.3	20.0	...	...	
41	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	
42	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	
43	28.3	...	28.2	...	26.7	25.8	25.2	24.8	24.7	24.5	24.3	24.0	...	...	
44	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	
45	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...	

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	4	...	8	3
2	22Cr-13Ni-5Mn	Fittings	SA-403	XM-19	S20910	...	...	8	3
3	22Cr-13Ni-5Mn	Fittings	SA-403	XM-19	S20910	CR	...	8	3
4	22Cr-13Ni-5Mn	Wld. fittings	SA-403	XM-19	S20910	WP-W	...	8	3
5	22Cr-13Ni-5Mn	Wld. fittings	SA-403	XM-19	S20910	WP-W	...	8	3
6	22Cr-13Ni-5Mn	Wld. fittings	SA-403	XM-19	S20910	WP-WX	...	8	3
7	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	...	...	8	3
8	22Cr-13Ni-5Mn	Wld. pipe	SA-813	TPXM-19	S20910	...	...	8	3
9	22Cr-13Ni-5Mn	Wld. pipe	SA-814	TPXM-19	S20910	...	...	8	3
10	22Cr-13Ni-5Mn	Forgings	SA-965	FXM-19	S20910	...	...	8	3
11	23Cr-4Ni-Mo-Cu	Plate	SA-240	...	S32304	...	...	10H	1
12	23Cr-12Ni	Fittings	SA-403	309	S30900	...	...	8	2
13	23Cr-12Ni	Fittings	SA-403	309	S30900	...	...	8	2
14	23Cr-12Ni	Fittings	SA-403	309	S30900	WP-S	...	8	2
15	23Cr-12Ni	Wld. fittings	SA-403	309	S30900	WP-W	...	8	2
16	23Cr-12Ni	Wld. fittings	SA-403	309	S30900	WP-W	...	8	2
17	23Cr-12Ni	Wld. fittings	SA-403	309	S30900	WP-WX	...	8	2
18	23Cr-12Ni	Smls. tube	SA-213	TP309S	S30908	...	...	8	2
19	23Cr-12Ni	Plate	SA-240	309S	S30908	...	...	8	2
20	23Cr-12Ni	Wld. tube	SA-249	TP309S	S30908	...	...	8	2
21	23Cr-12Ni	Smls. pipe	SA-312	TP309S	S30908	...	...	8	2
22	23Cr-12Ni	Wld. pipe	SA-312	TP309S	S30908	...	...	8	2
23	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	1	...	8	2
24	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	3	...	8	2
25	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	4	...	8	2
26	23Cr-12Ni	Bar	SA-479	309S	S30908	...	...	8	2
27	23Cr-12Ni	Wld. pipe	SA-813	TP309S	S30908	...	...	8	2
28	23Cr-12Ni	Wld. pipe	SA-814	TP309S	S30908	...	...	8	2
29	23Cr-12Ni	Bar	SA/JIS G4303	SUS309S	...	...	...	8	2
30	23Cr-12Ni	Smls. tube	SA-213	TP309H	S30909	...	...	8	2
31	23Cr-12Ni	Plate	SA-240	309H	S30909	...	...	8	2
32	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...	...	8	2
33	23Cr-12Ni	Smls. pipe	SA-312	TP309H	S30909	...	...	8	2
34	23Cr-12Ni	Wld. pipe	SA-312	TP309H	S30909	...	...	8	2
35	23Cr-12Ni	Bar	SA-479	309H	S30909	...	...	8	2
36	23Cr-12Ni-Cb	Smls. tube	SA-213	TP309Cb	S30940	...	...	8	2
37	23Cr-12Ni-Cb	Plate	SA-240	309Cb	S30940	...	...	8	2
38	23Cr-12Ni-Cb	Wld. tube	SA-249	TP309Cb	S30940	...	...	8	2
39	23Cr-12Ni-Cb	Smls. pipe	SA-312	TP309Cb	S30940	...	...	8	2
40	23Cr-12Ni-Cb	Wld. pipe	SA-312	TP309Cb	S30940	...	...	8	2
41	23Cr-12Ni-Cb	Wld. pipe	SA-813	TP309Cb	S30940	...	...	8	2
42	23Cr-12Ni-Cb	Wld. pipe	SA-814	TP309Cb	S30940	...	...	8	2
(23) 43	24Cr-22Ni-6Mo-2W-Cu-N	Forgings	SA-182	F58	S31266	...	...	45	...
(23) 44	24Cr-22Ni-6Mo-2W-Cu-N	Plate	SA-240	...	S31266	...	...	45	...
(23) 45	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-358	...	S31266	...	...	45	...

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	100	55	800	NP	HA-6	G7
2	100	55	800	NP	HA-6	G7
3	100	55	NP	800	HA-6	G7, G18
4	100	55	800	NP	HA-6	G7
5	100	55	NP	800	HA-6	G7, G18
6	100	55	NP	800	HA-6	G7, G18
7	100	55	800	800	HA-6	G7
8	100	55	800	NP	HA-6	G7
9	100	55	800	NP	HA-6	G7
10	100	55	800	800	HA-6	G7
11	87	58	NP	600	HA-6	G7, G13
12	75	30	800	NP	HA-2	G7
13	75	30	NP	800	HA-2	G7, G18
14	75	30	NP	800	HA-2	G7
15	75	30	800	NP	HA-2	G7
16	75	30	NP	800	HA-2	G7, G18
17	75	30	NP	800	HA-2	G7, G18
18	75	30	NP	800	HA-2	G7, G9
19	75	30	NP	800	HA-2	G7, G9
20	75	30	NP	800	HA-2	G7, G18
21	75	30	NP	800	HA-2	G7, G9
22	75	30	NP	800	HA-2	G7, G9, G18
23	75	30	800	NP	HA-2	G7
24	75	30	800	NP	HA-2	G7
25	75	30	800	NP	HA-2	G7
26	75	30	800	NP	HA-2	G7
27	75	30	NP	800	HA-2	G7, G9, G18
28	75	30	NP	800	HA-2	G7, G9, G18
29	75	30	800	NP	HA-2	G7
30	75	30	NP	800	HA-2	G7
31	75	30	NP	800	HA-2	G7
32	75	30	NP	800	HA-2	G7, G18
33	75	30	NP	800	HA-2	G7
34	75	30	NP	800	HA-2	G7, G18
35	75	30	NP	800	HA-2	G7
36	75	30	NP	800	HA-2	G7, G9
37	75	30	NP	800	HA-2	G7, G9
38	75	30	NP	800	HA-2	G7, G9, G18
39	75	30	NP	800	HA-2	G7, G9
40	75	30	NP	800	HA-2	G7, G9, G18
41	75	30	NP	800	HA-2	G7, G9, G18
42	75	30	NP	800	HA-2	G7, G9, G18
43	109	61	NP	800	HA-10	G2, G8
44	109	61	NP	800	HA-10	G2, G8
45	109	61	NP	800	HA-10	G2, G8

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
2	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
3	28.3	...	28.2	...	26.7	25.8	25.2	24.8	24.7	24.5	24.3	24.0	...	...
4	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
5	28.3	...	28.2	...	26.7	25.8	25.2	24.8	24.7	24.5	24.3	24.0	...	...
6	28.3	...	28.2	...	26.7	25.8	25.2	24.8	24.7	24.5	24.3	24.0	...	...
7	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
8	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
9	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
10	33.3	...	33.1	...	31.4	30.4	29.7	29.2	29.0	28.8	28.5	28.3	...	...
11	29.0	...	28.0	...	26.2	25.3	24.9	24.5	...	...	...	...	...	...
12	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
13	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
14	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
15	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
16	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
17	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
18	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
19	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
20	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
21	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
22	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
23	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
24	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
25	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
26	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
27	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
28	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
29	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
30	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
31	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
32	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
33	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
34	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
35	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
36	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
37	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
38	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
39	20.0	...	20.0	...	20.0	20.0	19.4	18.8	18.5	18.2	18.0	17.7	...	...
40	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
41	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
42	17.0	...	17.0	...	17.0	17.0	16.5	15.9	15.7	15.5	15.3	15.1	...	...
43	36.3	36.2	35.8	34.5	33.3	31.7	30.7	30.2	30.1	29.9	29.8	29.6	...	(23)
44	36.3	36.2	35.8	34.5	33.3	31.7	30.7	30.2	30.1	29.9	29.8	29.6	...	(23)
45	30.9	30.8	30.4	29.3	28.3	26.9	26.1	25.7	25.6	25.4	25.3	25.2	...	(23)

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
(23)	1	25Cr-5Ni-3Mo-2Cu	Plate	SA-240	255	S32550 ...	...	10H	1
	2	25Cr-6Ni-Mo-N	Plate	SA-240	...	S31200 ...	...	10H	1
	3	25Cr-12Ni	Castings	SA-351	CH8	J93400 ...	...	8	2
	4	25Cr-12Ni	Cast pipe	SA-451	CPH8	J93400 ...	...	8	2
	5	25Cr-12Ni	Castings	SA-351	CH20	J93402 ...	...	8	2
	6	25Cr-12Ni	Cast pipe	SA-451	CPH20	J93402 ...	...	8	2
	7	25Cr-20Ni	Castings	SA-351	CK20	J94202 ...	...	8	2
	8	25Cr-20Ni	Cast pipe	SA-451	CPK20	J94202 ...	...	8	2
	9	25Cr-20Ni	Forgings	SA-182	F310	S31000 ...	...	8	2
	10	25Cr-20Ni	Forgings	SA-965	F310	S31000 ...	...	8	2
	11	25Cr-20Ni	Smls. tube	SA-213	TP310S	S31008 ...	...	8	2
	12	25Cr-20Ni	Plate	SA-240	310S	S31008 ...	...	8	2
	13	25Cr-20Ni	Wld. tube	SA-249	TP310S	S31008 ...	...	8	2
	14	25Cr-20Ni	Smls. pipe	SA-312	TP310S	S31008 ...	...	8	2
	15	25Cr-20Ni	Wld. pipe	SA-312	TP310S	S31008 ...	...	8	2
	16	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008 1	...	8	2
	17	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008 3	...	8	2
	18	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008 4	...	8	2
	19	25Cr-20Ni	Fittings	SA-403	310S	S31008 ...	...	8	2
	20	25Cr-20Ni	Fittings	SA-403	310S	S31008 CR	...	8	2
	21	25Cr-20Ni	Fittings	SA-403	310S	S31008 WP-S	...	8	2
	22	25Cr-20Ni	Wld. fittings	SA-403	310S	S31008 WP-W	...	8	2
	23	25Cr-20Ni	Wld. fittings	SA-403	310S	S31008 WP-W	...	8	2
	24	25Cr-20Ni	Wld. fittings	SA-403	310S	S31008 WP-WX	...	8	2
	25	25Cr-20Ni	Wld. pipe	SA-813	TP310S	S31008 ...	...	8	2
	26	25Cr-20Ni	Wld. pipe	SA-814	TP310S	S31008 ...	...	8	2
	27	25Cr-20Ni	Smls. tube	SA-213	TP310H	S31009 ...	...	8	2
	28	25Cr-20Ni	Plate	SA-240	310H	S31009 ...	...	8	2
	29	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009 ...	...	8	2
	30	25Cr-20Ni	Smls. pipe	SA-312	TP310H	S31009 ...	...	8	2
	31	25Cr-20Ni	Wld. pipe	SA-312	TP310H	S31009 ...	...	8	2
	32	25Cr-20Ni-Cb	Wld. tube	SA-249	TP310Cb	S31040 ...	...	8	2
	33	25Cr-20Ni-Cb	Wld. pipe	SA-312	TP310Cb	S31040 ...	...	8	2
	34	25Cr-20Ni-Cb	Wld. pipe	SA-813	TP310Cb	S31040 ...	...	8	2
	35	25Cr-20Ni-Cb	Wld. pipe	SA-814	TP310Cb	S31040 ...	...	8	2
(23)	36	25Cr-22Ni-2Mo-N	Forgings	SA-182	F310MoLN	S31050 ...	...	8	2
	37	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050 ...	0.250 < t ≤ 1.250	8	2
	38	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050 ...	0.250 < t ≤ 1.250	8	2
	39	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050 ...	0.250 < t ≤ 1.250	8	2
	40	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050 ...	...	8	2
	41	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050 ...	≤0.250, wall	8	2
	42	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050 ...	≤0.250, wall	8	2
	43	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050 ...	≤0.250, wall	8	2
(23)	44	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906 ...	t ≥ 0.40	10H	1
(23)	45	29Cr-6.5Ni-2Mo-N	Bar	SA-479	...	S32906 ...	...	10H	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	110	80	NP	500	HA-5	G7
2	100	65	NP	600	HA-5	G7, G13
3	65	28	800	800	HA-3	G7, G9, G10, G13
4	65	28	800	NP	HA-3	G7, G13
5	70	30	800	800	HA-2	G7
6	70	30	800	NP	HA-2	G7
7	65	28	800	800	HA-3	G7
8	65	28	800	NP	HA-3	G7
9	75	30	NP	800	HA-2	G7, G9, G11, G12
10	75	30	800	800	HA-2	G7, G9, G11, G12
11	75	30	NP	800	HA-2	G7, G9, G11, G12
12	75	30	NP	800	HA-2	G7, G9, G11, G12
13	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
14	75	30	NP	800	HA-2	G7, G9, G11, G12
15	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
16	75	30	800	NP	HA-2	G7
17	75	30	800	NP	HA-2	G7
18	75	30	800	NP	HA-2	G7
19	75	30	800	NP	HA-2	G7
20	75	30	NP	800	HA-2	G7, G18
21	75	30	NP	800	HA-2	G7
22	75	30	800	NP	HA-2	G7
23	75	30	NP	800	HA-2	G7, G18
24	75	30	NP	800	HA-2	G7, G18
25	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
26	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
27	75	30	NP	800	HA-2	G7
28	75	30	NP	800	HA-2	G7
29	75	30	NP	800	HA-2	G7, G18
30	75	30	NP	800	HA-2	G7
31	75	30	NP	800	HA-2	G7, G18
32	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
33	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
34	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
35	75	30	NP	800	HA-2	G7, G9, G11, G12, G18
36	78	37	NP	800	HA-2	G7
37	78	37	NP	800	HA-2	...
38	78	37	NP	800	HA-2	G18
39	78	37	NP	800	HA-2	G18
40	80	35	NP	600	HA-2	...
41	84	39	NP	800	HA-2	...
42	84	39	NP	800	HA-2	G18
43	84	39	NP	800	HA-2	G18
44	109	80	NP	600	HA-5	G8
45	109	80	NP	600	HA-5	G8

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	36.7	36.6	36.5	35.5	34.5	33.4	32.9	...	...	...	...	...	...	...
2	33.3	...	33.3	...	31.6	30.7	30.5	30.5	...	...	...	...	...	...
3	18.7	...	18.7	...	18.5	18.0	17.7	17.1	16.7	16.3	15.9	15.4	...	...
4	18.7	...	18.7	...	18.5	18.0	17.7	17.1	16.7	16.3	15.9	15.4	...	...
5	20.0	...	20.0	...	19.9	19.4	18.9	18.3	17.9	17.5	17.0	16.5	...	...
6	20.0	...	20.0	...	19.9	19.4	18.9	18.3	17.9	17.5	17.0	16.5	...	...
7	18.7	...	18.7	...	18.5	18.0	17.7	17.1	16.7	16.3	15.9	15.4	...	...
8	18.7	...	18.7	...	18.5	18.0	17.7	17.1	16.7	16.3	15.9	15.4	...	...
9	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
10	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
11	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
12	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
13	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
14	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
15	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
16	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
17	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
18	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
19	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
20	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
21	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
22	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
23	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
24	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
25	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
26	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
27	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
28	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
29	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
30	20.0	...	20.0	...	20.0	20.0	19.3	18.5	18.2	17.9	17.7	17.4	...	...
31	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
32	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
33	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
34	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
35	17.0	...	17.0	...	17.0	17.0	16.4	15.7	15.5	15.2	15.0	14.8	...	...
36	24.7	...	24.7	...	24.3	23.4	22.7	21.5	21.0	20.4	19.9	19.4	...	...
37	24.7	...	24.7	...	24.3	23.4	22.7	21.5	21.0	20.4	19.9	19.4	...	...
38	21.0	...	21.0	...	20.7	19.9	19.3	18.3	17.8	17.4	16.9	16.5	...	...
39	21.0	...	21.0	...	20.7	19.9	19.3	18.3	17.8	17.4	16.9	16.5	...	...
40	23.3	...	23.3	...	23.3	22.7	21.4	20.3	...	...	...	...	...	...
41	26.0	...	26.0	...	26.0	25.2	23.9	22.7	22.1	21.5	21.0	20.5	...	...
42	22.1	...	22.1	...	22.1	21.4	20.3	19.3	18.8	18.3	17.8	17.4	...	...
43	22.1	...	22.1	...	22.1	21.4	20.3	19.3	18.8	18.3	17.8	17.4	...	...
44	36.3	36.3	36.3	35.4	34.5	33.5	33.0	33.0	...	...	...	...	...	...
45	36.3	36.3	36.3	35.4	34.5	33.5	33.0	33.0	...	...	...	...	...	...

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Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
(23) 1	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	$t \geq 0.40$	10H	1
(23) 2	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	$t \geq 0.40$	10H	1
(23) 3	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	$t < 0.40$	10H	1
(23) 4	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	$t < 0.40$	10H	1
(23) 5	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	$t < 0.40$	10H	1

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	109	80	NP	600	HA-5	G8
2	109	80	NP	600	HA-5	G8
3	116	94	NP	600	HA-5	G8
4	116	94	NP	600	HA-5	G8
5	116	94	NP	600	HA-5	G8

Table 2A (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Ferrous Materials

Line	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
No.	100	150	200	250	300	400	500	600	650	700	750	800	850	900
1	36.3	36.3	36.3	35.4	34.5	33.5	33.0	33.0	...	...	...	...	...	...
2	36.3	36.3	36.3	35.4	34.5	33.5	33.0	33.0	...	...	...	...	...	...
3	38.7	38.7	38.6	37.7	36.8	35.6	35.2	35.2	...	...	...	...	...	...
4	38.7	38.7	38.6	37.7	36.8	35.6	35.2	35.2	...	...	...	...	...	...
5	38.7	38.7	38.6	37.7	36.8	35.6	35.2	35.2	...	...	...	...	...	...

NOTES TO TABLE 2A**GENERAL NOTES**

- (a) The following abbreviations are used: Smls., Seamless; Temp., Temperature; and Wld., Welded.
- (b) An alternative typeface is used for stress values based on successful experience in service (see Notes E1 through E4).
- (c) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-516/SA-516M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-516 Grade 70 shall be used when SA-516M Grade 485 is used in construction.
- (d) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (e) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (f) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - EXPERIENCE CRITERION

- E1 For values at 650°F and above, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- E2 For values at 700°F and above, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- E3 For values at 850°F and above, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- E4 For values at 900°F, the design stress intensity values or maximum allowable stress values are based on successful experience in service.

NOTES - GENERAL REQUIREMENTS

- G1 Material that conforms to Class 10, 13, 20, 23, 30, 33, 40, 43, 50, or 53 is not permitted.
- G2 Material that conforms to Class 11 or 12 is not permitted.
- G3 Material that conforms to Class 11 or 12 is not permitted when the nominal thickness of the material exceeds $\frac{3}{4}$ in.
- G4 Material that conforms to Class 11 or 12 is not permitted when the nominal thickness of the material exceeds $1\frac{1}{4}$ in.
- G5 For Section III applications, a product analysis is required on this material.
- G6 SA-723 shall not be used for minimum permissible temperature below +40°F.
- G7 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed 66 $\frac{2}{3}$ % but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction. Table Y-2 lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give allowable stress values that will result in lower levels of permanent strain.
- G8 This material has reduced toughness at room temperature after exposure at high temperature. The degree of embrittlement depends on composition, heat treatment, time, and temperature. The lowest temperature of concern is about 500°F. See Nonmandatory Appendix A, A-207.
- G9 At temperatures over 1000°F, these stress values apply only when the carbon is 0.04% or higher. This note is applicable only when stresses above 1000°F are published.
- G10 For temperatures above 1000°F, these stress values may be used only if the material has been heat treated by heating to a minimum temperature of 1900°F and quenching in water or rapidly cooling by other means. This note is applicable only when stresses above 1000°F are published.
- G11 These stress values at temperatures of 1050°F and above should be used only when assurance is provided that the steel has a predominant grain size not finer than ASTM No. 6. This note is applicable only when stresses above 1000°F are published.
- G12 These stress values shall be considered basic values to be used when no effort is made to control or check the grain size of the steel.
- G13 This steel may be expected to develop embrittlement after service at moderately elevated temperature; see Nonmandatory Appendix A, A-207 and A-208.
- G14 All forgings shall have a maximum tensile strength not in excess of 25 ksi above the specified minimum.
- G15 Fabricated from SA-387 Grade 12 Class 1 plate.
- G16 Fabricated from SA-387 Grade 12 Class 2 plate.
- G17 A factor of 4 was used for tensile strength to obtain the stress value.
- G18 A quality factor of 0.85 has been applied in arriving at the stress values for this material.
- G19 The tensile strength shall not be in excess of 20,000 psi above the specified minimum.
- G20 For Section VIII applications, SA-723 is exempt from the requirement in Section VIII, Division 2, 6.7.6.3(b) that the average of the individual Brinell hardness numbers shall not be more than 10% below or 25% above the number corresponding to the tensile strength.
- G21 See Section VIII, Division 2, 3.4.

NOTES - HEAT TREATMENT REQUIREMENTS

- H1 Annealed.

NOTES TO TABLE 2A (CONT'D)**NOTES – HEAT TREATMENT REQUIREMENTS (CONT'D)**

H2 Quenched and tempered at 1200°F.

H3 For Section III applications, pieces that are formed (after quenching and tempering) at a temperature lower than 25°F below the final tempering temperature shall be heat treated after forming when the extreme fiber strain from forming exceeds 3%. Heat treatment shall be 1075°F minimum, but not higher than 25°F below the final tempering temperature for a minimum time of 1 hr per inch of thickness. Pieces formed at temperatures within 25°F higher than the original tempering temperature shall be requenched and tempered, either before or after welding into the vessel.

H4 Liquid quenched and tempered.

H5 Normalized, normalized and tempered, or quenched and tempered.

H6 For Section VIII applications involving consideration of heat treatment after forming or welding, see Section VIII, Division 2, Table 6.15 for P-No. 10K, Group No. 1 materials.

NOTES – SIZE REQUIREMENTS

S1 The maximum thickness of forgings shall not exceed $3\frac{3}{4}$ in. (4 in. as heat treated).

S2 Both NPS 8 and larger, and schedule 140 and heavier.

S3 The minimum thickness of pressure-retaining parts shall be $\frac{1}{4}$ in.

S4 For Section III applications, the minimum thickness of shells, heads, and other pressure-retaining parts shall be $\frac{1}{4}$ in. The maximum thickness shall be limited only by the ability to develop the specified mechanical properties.

S5 Either NPS 8 and larger and less than schedule 140 wall, or less than NPS 8 and all wall thicknesses.

S6 The maximum section thickness shall not exceed 3 in. for double-normalized-and-tempered forgings, or 5 in. for quenched-and-tempered forgings.

NOTES – WELDING REQUIREMENTS

W1 Not for welded construction.

W2 In welded construction, for temperatures above 850°F, the weld metal shall have a carbon content of greater than 0.05%.

W3 The following, in addition to the variables in Section IX, QW-250, shall be considered as essential variables requiring requalification of the welding procedure:

(a) An increase in the maximum or a decrease in the minimum specified preheat or interpass temperatures. The specified range of preheat temperatures shall not exceed 150°F.

(b) A change in the thickness T of the welding procedure qualification test plate as follows:

(1) For welded joints that are quenched and tempered after welding, any increase in thickness (the minimum thickness qualified in all cases is $\frac{1}{4}$ in.).

(2) For welded joints that are not quenched and tempered after welding, any change as follows:

(-a) for T less than $\frac{5}{8}$ in., any decrease in thickness (the maximum thickness qualified is $2T$);

(-b) for T equal to $\frac{5}{8}$ in. and over, any departure from the range of $\frac{5}{8}$ in. to $2T$.

W4 Welded, with the tensile strength of the Section IX reduced section tension test less than 100 ksi but not less than 95 ksi.

W5 For Section VIII applications, welding not permitted when carbon content exceeds 0.35% by ladle analysis except for limited types of welding, as allowed in Section VIII, Division 2, Part 6.

W6 For Section VIII applications, Section IX, QW-250 Variables QW-404.12, QW-406.3, QW-407.2, and QW-409.1 shall also apply to this material. These variables shall be applied in accordance with the rules for welding of Section VIII, Division 2, Part 6.

W7 Nonwelded, or welded if the tensile strength of the Section IX reduced section tension test is not less than 100 ksi.

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Table 2B
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P.No.
1	...	Drawn smls. tube	SB-210	...	Alclad 3003	O	0.010–0.500	21
2	...	Drawn smls. tube	SB-210	...	Alclad 3003	H113	0.050–0.500	21
3	...	Smls. extr. tube	SB-241	...	Alclad 3003	O	...	21
4	...	Smls. extr. tube	SB-241	...	Alclad 3003	H112	...	21
5	...	Plate, sheet	SB-209	...	A93003	O	0.006–3.000	21
6	...	Plate, sheet	SB-209	...	A93003	H112	0.250–0.499	21
7	...	Plate, sheet	SB-209	...	A93003	H112	0.500–2.000	21
8	...	Plate, sheet	SB-209	...	A93003	H112	2.001–3.000	21
9	...	Drawn smls. tube	SB-210	...	A93003	O	0.010–0.500	21
10	...	Drawn smls. tube	SB-210	...	A93003	H113	0.010–0.500	21
11	...	Bar, rod, shapes	SB-221	...	A93003	O	...	21
12	...	Bar, rod, shapes	SB-221	...	A93003	H112	...	21
13	...	Smls. extr. tube	SB-241	...	A93003	O	...	21
14	...	Smls. pipe	SB-241	...	A93003	H112	≥1.000	21
15	...	Smls. extr. tube	SB-241	...	A93003	H112	...	21
16	...	Plate, sheet	SB-209	...	A93004	O	0.006–3.000	22
17	...	Plate, sheet	SB-209	...	A93004	H112	0.250–3.000	22
18	...	Plate, sheet	SB-209	...	A95052	O	0.051–3.000	22
19	...	Plate, sheet	SB-209	...	A95052	H112	0.250–0.499	22
20	...	Plate, sheet	SB-209	...	A95052	H112	0.500–3.000	22
21	...	Plate, sheet	SB-209	...	A95083	O	0.051–1.500	25
22	...	Plate, sheet	SB-209	...	A95083	O	1.501–3.000	25
23	...	Plate, sheet	SB-209	...	A95083	O	3.001–5.000	25
24	...	Plate, sheet	SB-209	...	A95083	O	5.001–7.000	25
25	...	Plate, sheet	SB-209	...	A95083	O	7.001–8.000	25
26	...	Plate, sheet	SB-209	...	A95083	H112	0.250–1.500	25
27	...	Plate, sheet	SB-209	...	A95083	H112	1.501–3.000	25
28	...	Bar, rod, shapes	SB-221	...	A95083	H111	≤5.000	25
29	...	Smls. extr. tube	SB-241	...	A95083	H111	...	25
30	...	Plate, sheet	SB-209	...	A95086	O	0.051–2.000	25
31	...	Plate, sheet	SB-209	...	A95086	H112	0.063–0.499	25
32	...	Plate, sheet	SB-209	...	A95086	H112	0.500–1.000	25
33	...	Plate, sheet	SB-209	...	A95086	H112	1.001–2.000	25
34	...	Plate, sheet	SB-209	...	A95086	H112	2.001–3.000	25
35	...	Plate, sheet	SB-209	...	A95454	O	0.051–3.000	22
36	...	Plate, sheet	SB-209	...	A95454	H112	0.250–0.499	22
37	...	Plate, sheet	SB-209	...	A95454	H112	0.500–3.000	22
38	...	Bar, rod, shapes	SB-221	...	A95454	O	≤5.000	22
39	...	Bar, rod, shapes	SB-221	...	A95454	H112	≤5.000	22
40	...	Smls. extr. tube	SB-241	...	A95454	O	≤5.000	22
41	...	Smls. extr. tube	SB-241	...	A95454	H112	≤5.000	22
42	...	Plate, sheet	SB-209	...	A96061	T4	0.051–0.249	23
43	...	Plate, sheet	SB-209	...	A96061	T451	0.250–3.000	23
44	...	Plate, sheet	SB-209	...	A96061	T6	0.051–0.249	23
45	...	Plate, sheet	SB-209	...	A96061	T651	0.250–4.000	23

Table 2B
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	13	4.5	NP	250	NFA-7	G8
2	13	4.5	NP	250	NFA-7	G8, W2
3	13	4.5	NP	250	NFA-7	G8
4	13	4.5	NP	250	NFA-7	G8, W2
5	14	5	NP	250	NFA-1	G8
6	17	10	NP	250	NFA-1	G8, W2
7	15	6	NP	200	NFA-1	G8, W2
8	14.5	6	NP	200	NFA-1	G8, W2
9	14	5	NP	250	NFA-1	G8
10	14	5	NP	250	NFA-1	G8, W2
11	14	5	NP	250	NFA-1	G2, G8
12	14	5	NP	250	NFA-1	G2, G8, W2
13	14	5	NP	250	NFA-1	G8
14	14	5	NP	250	NFA-1	G8
15	14	5	NP	250	NFA-1	G8, W2
16	22	8.5	NP	250	NFA-3	G8
17	23	9	NP	250	NFA-3	G8, W2
18	25	9.5	NP	200	NFA-8	G8
19	28	16	NP	200	NFA-8	G8, W2
20	25	9.5	NP	200	NFA-8	G8, W2
21	40	18	NP	150	NFA-11	G7, G8
22	39	17	NP	150	NFA-11	G7, G8
23	38	16	NP	150	NFA-11	G7, G8
24	37	15	NP	150	NFA-11	G7, G8
25	36	14	NP	150	NFA-11	G7, G8
26	40	18	NP	150	NFA-11	G7, G8, W2
27	39	17	NP	150	NFA-11	G7, G8, W2
28	40	24	NP	150	NFA-11	G2, G7, G8, W2
29	40	24	NP	150	NFA-11	G7, G8, W2
30	35	14	NP	150	NFA-9	G7, G8
31	36	18	NP	150	NFA-9	G7, G8, W2
32	35	16	NP	150	NFA-9	G7, G8, W2
33	35	14	NP	150	NFA-9	G7, G8, W2
34	34	14	NP	150	NFA-9	G7, G8, W2
35	31	12	NP	250	NFA-6	E2, G8
36	32	18	NP	250	NFA-6	E2, G8, W2
37	31	12	NP	250	NFA-6	E2, G8, W2
38	31	12	NP	250	NFA-6	E2, G2, G8
39	31	12	NP	250	NFA-6	E2, G2, G8, W2
40	31	12	NP	250	NFA-6	E2, G8
41	31	12	NP	250	NFA-6	E2, G8, W2
42	30	16	NP	300	NFA-13	G8, G9, W3
43	30	16	NP	300	NFA-13	G8, G9, W3
44	42	35	NP	300	NFA-12	G8, G9, W3
45	42	35	NP	300	NFA-12,13	G8, G9, W3

Table 2B
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	3.0	3.0	3.0	2.7	...	...	...	...	...	...	...	...	...	...	...
2	3.0	3.0	3.0	2.7	...	...	...	...	...	...	...	...	...	...	...
3	3.0	3.0	3.0	2.7	...	...	...	...	...	...	...	...	...	...	...
4	3.0	3.0	3.0	2.7	...	...	...	...	...	...	...	...	...	...	...
5	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
6	5.7	5.7	5.7	5.3	...	...	...	...	...	...	...	...	...	...	...
7	4.0	4.0	4.0	...	...	...	...	...	...	...	...	...	...	...	...
8	4.0	4.0	4.0	...	...	...	...	...	...	...	...	...	...	...	...
9	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
10	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
11	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
12	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
13	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
14	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
15	3.3	3.3	3.3	3.0	...	...	...	...	...	...	...	...	...	...	...
16	5.7	5.7	5.7	5.5	...	...	...	...	...	...	...	...	...	...	...
17	6.0	6.0	6.0	5.8	...	...	...	...	...	...	...	...	...	...	...
18	6.3	6.3	6.3	...	...	...	...	...	...	...	...	...	...	...	...
19	9.3	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...
20	6.3	6.3	6.3	...	...	...	...	...	...	...	...	...	...	...	...
21	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...
22	11.4	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...
23	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...
24	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...
25	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...
26	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...
27	11.3	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...
28	13.3	13.3	...	...	...	...	...	...	...	...	...	...	...	...	...
29	13.3	13.3	...	...	...	...	...	...	...	...	...	...	...	...	...
30	9.3	9.1	...	...	...	...	...	...	...	...	...	...	...	...	...
31	12.0	11.8	...	...	...	...	...	...	...	...	...	...	...	...	...
32	10.7	10.5	...	...	...	...	...	...	...	...	...	...	...	...	...
33	9.3	9.1	...	...	...	...	...	...	...	...	...	...	...	...	...
34	9.3	9.1	...	...	...	...	...	...	...	...	...	...	...	...	...
35	8.0	8.0	8.0	7.5	...	...	...	...	...	...	...	...	...	...	...
36	10.7	10.7	10.7	7.5	...	...	...	...	...	...	...	...	...	...	...
37	8.0	8.0	8.0	7.5	...	...	...	...	...	...	...	...	...	...	...
38	8.0	8.0	8.0	7.5	...	...	...	...	...	...	...	...	...	...	...
39	8.0	8.0	8.0	7.5	...	...	...	...	...	...	...	...	...	...	...
40	8.0	8.0	8.0	7.5	...	...	...	...	...	...	...	...	...	...	...
41	8.0	8.0	8.0	7.5	...	...	...	...	...	...	...	...	...	...	...
42	10.0	10.0	10.0	8.6	8.1	...	...	...	...	...	...	...	...	...	...
43	10.0	10.0	10.0	8.6	8.1	...	...	...	...	...	...	...	...	...	...
44	14.0	14.0	14.0	13.4	11.3	...	...	...	...	...	...	...	...	...	...
45	14.0	14.0	14.0	13.4	11.3	...	...	...	...	...	...	...	...	...	...

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Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P-No.
1	...	Plate, sheet	SB-209	...	A96061	T651	4.001–6.000	23
2	...	Drawn smls. tube	SB-210	...	A96061	T4	0.025–0.500	23
3	...	Drawn smls. tube	SB-210	...	A96061	T6	0.025–0.500	23
4	...	Bar, rod, shapes	SB-221	...	A96061	T4	...	23
5	...	Bar, rod, shapes	SB-221	...	A96061	T6	...	23
6	...	Smls. extr. tube/pipe	SB-241	...	A96061	T4	...	23
7	...	Smls. extr. tube/pipe	SB-241	...	A96061	T6	...	23
8	...	Smls. drawn pipe	SB-241	...	A96061	T6	<1 NPS	23
9	...	Smls. drawn pipe	SB-241	...	A96061	T6	≥1 NPS	23
10	...	Shapes	SB-308	...	A96061	T6	...	23
11	...	Drawn smls. tube	SB-210	...	A96063	T6	0.025–0.500	23
12	...	Bar, rod, shapes	SB-221	...	A96063	T5	≤0.500	23
13	...	Bar, rod, shapes	SB-221	...	A96063	T5	0.501–1.000	23
14	...	Bar, rod, shapes	SB-221	...	A96063	T6	≤1.000	23
15	...	Smls. extr. tube	SB-241	...	A96063	T5	≤0.500	23
16	...	Smls. extr. tube	SB-241	...	A96063	T5	0.501–1.000	23
17	...	Smls. extr. tube	SB-241	...	A96063	T6	≤1.000	23
(23) 18	...	...	...	...	...	...	...	...
(23) 19	...	...	...	...	...	...	...	...
(23) 20	...	Bar, rod	SB-187	...	C10200	O60	All	31
(23) 21	...	Bar, rod	SB-187	...	C10200	O60	All	31
(23) 22	...	Bar, rod	SB-187	...	C11000	O60	All	31
(23) 23	...	Bar, rod	SB-187	...	C11000	O60	All	31
(23) 24	...	Smls. tube	SB-111	...	C28000	O61	...	32
25	...	Smls. tube	SB-111	...	C44300	O61	...	32
26	...	Smls. tube	SB-111	...	C44400	O61	...	32
27	...	Smls. tube	SB-111	...	C44500	O61	...	32
28	...	Plate	SB-171	...	C46400	M10, M20, O20, O25	$3 < t \leq 5$	32
29	...	Plate	SB-171	...	C46400	M10, M20, O20, O25	≤ 3	32
30	...	Smls. tube	SB-111	...	C60800	O61	...	35
(23) 31	...	...	...	...	...	...	...	...
(23) 32	...	...	...	...	...	...	...	...
(23) 33	...	Plate, sheet	SB-169	...	C61400	O25, O60, M20	$2 < t \leq 5$	35
(23) 34	...	Plate, sheet	SB-169	...	C61400	O25, O60, M20	$2 < t \leq 5$	35
(23) 35	...	Plate, sheet	SB-169	...	C61400	O25, O60, M20	$\frac{1}{2} < t \leq 2$	35
(23) 36	...	Plate, sheet	SB-169	...	C61400	O25, O60, M20	$\frac{1}{2} < t \leq 2$	35
(23) 37	...	Plate, sheet	SB-169	...	C61400	O25, O60, M20	$t \leq \frac{1}{2}$	35
(23) 38	...	Plate, sheet	SB-169	...	C61400	O25, O60, M20	$t \leq \frac{1}{2}$	35
(23) 39	...	Bar, rod	SB-98	...	C65100	O60	All	33
(23) 40	...	Bar, rod	SB-98	...	C65100	O60	All	33
(23) 41	...	Bar, rod	SB-98	...	C65100	H02	≤ 2	33
(23) 42	...	Bar, rod	SB-98	...	C65100	H02	≤ 2	33
(23) 43	...	Plate, sheet	SB-96	...	C65500	O61	≤ 2	33
(23) 44	...	Plate, sheet	SB-96	...	C65500	O61	≤ 2	33
(23) 45	...	Bar, rod	SB-98	...	C65500	O60	All	33

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	40	35	NP	300	NFA-12,13	G8, G9, W3
2	30	16	NP	300	NFA-13	G8, W3
3	42	35	NP	300	NFA-12,13	G8, W3
4	26	16	NP	300	NFA-13	G2, G8, G9, W3
5	38	35	NP	300	NFA-12,13	G2, G8, G9, W3
6	26	16	NP	300	NFA-13	G8, G9, W3
7	38	35	NP	300	NFA-12,13	G8, G9, W3
8	42	35	NP	300	NFA-12,13	G8, W3
9	38	35	NP	300	NFA-12,13	G8, W3
10	38	35	NP	300	NFA-12,13	G2, G8, W3
11	33	28	NP	300	NFA-1	G8, W3
12	22	16	NP	300	NFA-1	E2, G2, G8, W3
13	21	15	NP	300	NFA-1	E2, G2, G8, W3
14	30	25	NP	300	NFA-1	G2, G8, W3
15	22	16	NP	300	NFA-1	E2, G8, W3
16	21	15	NP	300	NFA-1	E2, G8, W3
17	30	25	NP	300	NFA-1	G8, W3
18	...	...	...	...	...	...
19	...	...	...	...	...	...
20	28	8	NP	300	NFC-1	E5, G4
21	28	8	NP	300	NFC-1	E5, G1, G4
22	28	8	NP	300	NFC-1	E5, G4
23	28	8	NP	300	NFC-1	E5, G1, G4
24	50	20	NP	500	NFC-3	E5, G4, G6
25	45	15	NP	500	NFC-2	E3, G4, G6
26	45	15	NP	500	NFC-2	E3, G4, G6
27	45	15	NP	500	NFC-2	E3, G4, G6
28	50	18	NP	100	NFC-2	G4
29	50	20	NP	100	NFC-2	G4
30	50	19	NP	100	NFC-3	G4, G6
31	...	...	...	...	...	...
32	...	...	...	...	...	...
33	65	28	NP	500	NFC-8	G4
34	65	28	NP	500	NFC-8	G1, G4
35	70	30	NP	500	NFC-8	G4
36	70	30	NP	500	NFC-8	G1, G4
37	72	32	NP	500	NFC-8	G4
38	72	32	NP	500	NFC-8	G1, G4
39	40	12	NP	300	NFC-1	G4, G10
40	40	12	NP	300	NFC-1	G1, G4, G10
41	55	20	NP	350	NFC-2	G4, G10, W2
42	55	20	NP	350	NFC-2	G1, G4, G10, W2
43	50	18	NP	300	NFC-2	G4, G10
44	50	18	NP	300	NFC-2	G1, G4, G10
45	52	15	NP	350	NFC-2	G4, G10

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	13.3	13.3	13.3	12.8	10.8	...	...	...	...	...	...	...	...	...	...
2	10.0	10.0	10.0	8.6	8.1	...	...	...	...	...	...	...	...	...	...
3	14.0	14.0	14.0	13.4	11.3	...	...	...	...	...	...	...	...	...	...
4	8.7	8.7	8.7	8.5	8.0	...	...	...	...	...	...	...	...	...	...
5	12.7	12.7	12.7	12.1	10.2	...	...	...	...	...	...	...	...	...	...
6	8.7	8.7	8.7	8.5	8.0	...	...	...	...	...	...	...	...	...	...
7	12.7	12.7	12.7	12.1	10.2	...	...	...	...	...	...	...	...	...	...
8	14.0	14.0	14.0	13.4	11.3	...	...	...	...	...	...	...	...	...	...
9	12.7	12.7	12.7	12.1	10.2	...	...	...	...	...	...	...	...	...	...
10	12.7	12.7	12.7	12.1	10.2	...	...	...	...	...	...	...	...	...	...
11	11.0	11.0	11.0	8.7	6.4	...	...	...	...	...	...	...	...	...	...
12	7.3	7.3	7.3	5.1	4.6	...	...	...	...	...	...	...	...	...	...
13	7.0	7.0	7.0	4.9	4.4	...	...	...	...	...	...	...	...	...	...
14	10.0	10.0	10.0	7.9	5.8	...	...	...	...	...	...	...	...	...	...
15	7.3	7.3	7.3	5.1	4.6	...	...	...	...	...	...	...	...	...	...
16	7.0	7.0	7.0	4.9	4.4	...	...	...	...	...	...	...	...	...	...
17	10.0	10.0	10.0	7.9	5.8	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	(23)
21	5.3	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	(23)
22	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	(23)
23	5.3	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	(23)
24	13.3	13.3	13.3	13.3	13.3	10.8	5.3	2.0	1.0	...	...	...	...	...	(23)
25	10.0	10.0	10.0	10.0	10.0	9.8	3.5	2.0	1.0	...	...	...	...	...	...
26	10.0	10.0	10.0	10.0	10.0	9.8	3.5	2.0	1.0	...	...	...	...	...	...
27	10.0	10.0	10.0	10.0	10.0	9.8	3.5	2.0	1.0	...	...	...	...	...	...
28	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	13.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	12.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	18.7	18.6	18.5	18.3	18.3	18.1	17.9	17.7	17.5	...	...	...	...	...	(23)
34	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	...	...	...	...	...	(23)
35	20.0	19.9	19.8	19.7	19.5	19.4	19.2	19.0	18.8	...	...	...	...	...	(23)
36	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	...	...	...	...	...	(23)
37	21.3	21.3	21.1	20.9	20.9	20.7	20.5	20.3	20.1	...	...	...	...	...	(23)
38	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	...	...	...	...	...	(23)
39	8.0	7.9	7.9	7.8	7.8	7.7	...	...	...	...	...	...	...	...	(23)
40	8.0	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...	...	...	(23)
41	13.1	13.3	13.2	12.9	12.5	12.0	...	...	...	...	...	...	...	...	(23)
42	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...	...	...	...	(23)
43	12.0	12.0	11.9	11.9	11.9	...	...	...	...	...	...	...	...	...	(23)
44	12.0	12.0	12.0	12.0	12.0	...	...	...	...	...	...	...	...	...	(23)
45	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	(23)

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Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P-No.
(23) 1	...	Bar, rod	SB-98	...	C65500	O60	All	33
(23) 2	...	Bar, rod	SB-98	...	C65500	H02	≤ 2	33
(23) 3	...	Bar, rod	SB-98	...	C66100	O60	All	33
(23) 4	...	Bar, rod	SB-98	...	C66100	O60	All	33
(23) 5	...	Bar, rod	SB-98	...	C66100	H02	≤ 2	33
6	...	Plate	SB-171	...	C70600	M10, M20, O20, O25	≤ 5	34
7	...	Plate	SB-171	...	C70600	M10, M20, O20, O25	≤ 5	34
8	...	Cond. tube	SB-111	...	C70600	O61	...	34
9	...	Cond. tube	SB-111	...	C70600	O61	...	34
10	...	Smls. U-bend tube	SB-395	...	C70600	O61	...	34
11	...	Smls. U-bend tube	SB-395	...	C70600	O61	...	34
12	...	Plate	SB-171	...	C70620	M10, M20, O20, O25	≤ 5	34
13	...	Plate	SB-171	...	C70620	M10, M20, O20, O25	≤ 5	34
14	...	Cond. tube	SB-111	...	C70620	O61	...	34
15	...	Cond. tube	SB-111	...	C70620	O61	...	34
16	...	Smls. U-bend tube	SB-395	...	C70620	O61	...	34
17	...	Smls. U-bend tube	SB-395	...	C70620	O61	...	34
18	...	Plate	SB-171	...	C71500	M10, M20, O20, O25	$2\frac{1}{2} < t \leq 5$	34
19	...	Plate	SB-171	...	C71500	M10, M20, O20, O25	$2\frac{1}{2} < t \leq 5$	34
20	...	Plate	SB-171	...	C71500	M10, M20, O20, O25	$\leq 2\frac{1}{2}$	34
21	...	Plate	SB-171	...	C71500	M10, M20, O20, O25	$\leq 2\frac{1}{2}$	34
22	...	Cond. tube	SB-111	...	C71500	O61	...	34
23	...	Cond. tube	SB-111	...	C71500	O61	...	34
24	...	Smls. U-bend tube	SB-395	...	C71500	O61	...	34
25	...	Smls. U-bend tube	SB-395	...	C71500	O61	...	34
(23) 26	...	Smls. tube	SB-111	...	C71500	HR50	...	34
27	...	Plate	SB-171	...	C71520	M10, M20, O20, O25	$2\frac{1}{2} < t \leq 5$	34
28	...	Plate	SB-171	...	C71520	M10, M20, O20, O25	$2\frac{1}{2} < t \leq 5$	34
29	...	Plate	SB-171	...	C71520	M10, M20, O20, O25	$\leq 2\frac{1}{2}$	34
30	...	Plate	SB-171	...	C71520	M10, M20, O20, O25	$\leq 2\frac{1}{2}$	34
31	...	Smls. tube	SB-111	...	C71520	O61	...	34
32	...	Smls. tube	SB-111	...	C71520	O61	...	34
(23) 33	...	Smls. U-bend tube	SB-395	...	C71520	O61	...	34
34	...	Smls. U-bend tube	SB-395	...	C71520	O61	...	34
(23) 35	...	Smls. tube	SB-111	...	C71520	HR50	...	34
36	...	Castings	SB-584	...	C93700	M01 or M07	...	...
37	...	Castings	SB-584	...	C93700	M01 or M07	...	...
38	99Ni	Smls. pipe & tube	SB-161	...	N02200	Annealed	> 5 O.D.	41
39	99Ni	Bar, rod	SB-160	...	N02200	Annealed	...	41
40	99Ni	Smls. pipe & tube	SB-161	...	N02200	Annealed	≤ 5 O.D.	41
41	99Ni	Plate, sheet, strip	SB-162	...	N02200	Annealed	...	41
42	99Ni	Smls. tube	SB-163	...	N02200	Annealed	...	41
43	99Ni	Plate, sheet, strip	SB-162	...	N02200	As rolled	...	41
44	99Ni-Low C	Bar, rod	SB-160	...	N02201	Annealed	...	41
45	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed	> 5 O.D.	41

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	52	15	NP	350	NFC-2	G1, G4, G10
2	70	38	NP	350	NFC-2	G4, G10, W2
3	52	15	NP	350	NFC-2	G4, G10
4	52	15	NP	350	NFC-2	G1, G4, G10
5	70	38	NP	350	NFC-2	G4, G10, W2
6	40	15	NP	450	NFC-3	G4
7	40	15	NP	450	NFC-3	G1, G4
8	40	15	NP	450	NFC-3	G4
9	40	15	NP	450	NFC-3	G1, G4
10	40	15	NP	450	NFC-3	G4
11	40	15	NP	450	NFC-3	G1, G4
12	40	15	NP	450	NFC-3	G4
13	40	15	NP	450	NFC-3	G1, G4
14	40	15	NP	450	NFC-3	G4
15	40	15	NP	450	NFC-3	G1, G4
16	40	15	NP	450	NFC-3	G4
17	40	15	NP	450	NFC-3	G1, G4
18	45	18	500	650	NFC-4	G4
19	45	18	500	650	NFC-4	G1, G4
20	50	20	500	650	NFC-4	G4
21	50	20	500	650	NFC-4	G1, G4
22	52	18	500	650	NFC-4	G4
23	52	18	500	650	NFC-4	G1, G4
24	52	18	NP	650	NFC-4	G4
25	52	18	NP	650	NFC-4	G1, G4
26	72	50	500	NP	NFC-4	...
27	45	18	500	650	NFC-4	G4
28	45	18	500	650	NFC-4	G1, G4
29	50	20	500	650	NFC-4	G4
30	50	20	500	650	NFC-4	G1, G4
31	52	18	500	650	NFC-4	G4
32	52	18	500	650	NFC-4	G1, G4
33	52	18	NP	650	NFC-4	G4
34	52	18	NP	650	NFC-4	G1, G4
35	72	50	500	500	NFC-4	...
36	30	12	400 (SPT)	NP	NFC-1	...
37	30	12	400 (SPT)	NP	NFC-1	G1
38	55	12	NP	600	NFN-2	G4
39	55	15	NP	600	NFN-2	G2, G4
40	55	15	NP	600	NFN-2	G4
41	55	15	NP	600	NFN-2	G4
42	55	15	NP	600	NFN-2	G4
43	55	20	NP	600	NFN-2	G4
44	50	10	NP	800	NFN-1	G2, G4
45	50	10	NP	800	NFN-1	G4

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...
2	23.3	23.3	23.3	23.3	23.3	23.2	...	...	...	...	...	...	...	...	...
3	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...
4	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...
5	23.3	23.3	23.3	23.3	23.3	23.2	...	...	...	...	...	...	...	...	...
6	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...
7	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...
8	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...
9	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...
10	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...
11	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...
12	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...
13	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...
14	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...
15	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...
16	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	...	...	...	...	...	...	...
17	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...
18	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	...	...	...
19	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...
20	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	...	...	...
21	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...
22	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	...	...	...
23	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...
24	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	...	...	...
25	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...
26	24.0	24.0	24.0	24.0	24.0	23.7	23.3	23.0	22.7	...	...	...	...	...	...
27	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	...	...	...
28	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...
29	13.3	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.8	10.7	10.6	...	...	...
30	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...
31	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	...	...	...
32	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...
33	12.0	11.6	11.3	11.0	10.8	10.5	10.3	10.1	9.9	9.8	9.6	9.5	...	...	...
34	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...
35	24.0	24.0	24.0	24.0	24.0	23.7	23.3	23.0	22.7	...	...	...	...	...	...
36	8.0	7.4	7.1	7.0	6.8	6.7	6.7	...	...	...	...	...	...	...	...
37	8.0	8.0	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...	...	...
38	8.0	...	8.0	...	8.0	...	8.0	...	8.0	...	8.0	...	...	...	...
39	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...
40	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...
41	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...
42	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	10.0	...	...	...	...
43	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.1	12.6	12.0	11.5	...	...	...	...
44	6.7	6.5	6.4	6.3	6.3	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.1	6.0
45	6.7	6.5	6.4	6.3	6.3	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.1	6.0

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Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P.No.
1	99Ni-Low C	Bar, rod	SB-160	...	N02201	Hot fin.	...	41
2	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed	≤5 O.D.	41
3	99Ni-Low C	Plate, sheet, strip	SB-162	...	N02201	Annealed	...	41
4	99Ni-Low C	Smls. tube	SB-163	...	N02201	Annealed	...	41
(23) 5	67Ni-30Cu	Bar, rod	SB-164	...	N04400	HW or CW ann.	All	42
6	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed	>5 O.D.	42
7	67Ni-30Cu	Forgings	SB-564	...	N04400	Annealed	...	42
8	67Ni-30Cu	Plate	SB-127	...	N04400	Annealed	...	42
9	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Annealed	...	42
10	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed	≤5 O.D.	42
(23) 11	67Ni-30Cu	Hexagons, rings, discs	SB-164	...	N04400	Hot worked	$2\frac{1}{8} < t \leq 4$	42
12	67Ni-30Cu	Plate	SB-127	...	N04400	As rolled	...	42
(23) 13	67Ni-30Cu	Rounds, squares, rectangles	SB-164	...	N04400	Hot worked	$12 < t \leq 14$	42
14	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Stress rel.	...	42
15	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Stress rel.	...	42
16	67Ni-30Cu-S	Bar, rod	SB-164	...	N04405	Annealed	...	42
17	67Ni-30Cu-S	Bar, rod	SB-164	...	N04405	Hot worked	...	42
18	47Ni-22Cr-9Mo-18Fe	Plate	SB-435	...	N06002	Annealed	$\frac{3}{16} < t \leq 2\frac{1}{2}$	43
19	47Ni-22Cr-9Mo-18Fe	Sheet	SB-435	...	N06002	Annealed	$\frac{1}{16} < t \leq \frac{3}{16}$	43
20	47Ni-22Cr-9Mo-18Fe	Rod	SB-572	...	N06002	Solution ann.	$\geq \frac{3}{16}$	43
21	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.	...	43
22	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.	...	43
23	47Ni-22Cr-9Mo-18Fe	Smls. pipe & tube	SB-622	...	N06002	Solution ann.	...	43
24	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.	...	43
25	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.	...	43
26	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.	$> \frac{3}{4}$	45
27	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.	$> \frac{3}{4}$	45
28	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.	$\frac{5}{16} < t \leq \frac{3}{4}$	45
29	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.	$\frac{3}{16} < t \leq \frac{3}{4}$	45
30	47Ni-22Cr-19Fe-6Mo	Wld. pipe	SB-619	...	N06007	Solution ann.	...	45
31	47Ni-22Cr-19Fe-6Mo	Smls. pipe & tube	SB-622	...	N06007	Solution ann.	...	45
32	47Ni-22Cr-19Fe-6Mo	Wld. tube	SB-626	...	N06007	Solution ann.	...	45
33	55Ni-21Cr-13.5Mo	Smls. & wld. fittings	SB-366	...	N06022	Solution ann.	...	43
34	55Ni-21Cr-13.5Mo	Forgings	SB-462	...	N06022	Solution ann.	...	43
35	55Ni-21Cr-13.5Mo	Forgings	SB-564	...	N06022	Solution ann.	...	43
36	55Ni-21Cr-13.5Mo	Rod	SB-574	...	N06022	Solution ann.	...	43
37	55Ni-21Cr-13.5Mo	Plate, sheet, strip	SB-575	...	N06022	Solution ann.	...	43
38	55Ni-21Cr-13.5Mo	Wld. pipe	SB-619	...	N06022	Solution ann.	...	43
39	55Ni-21Cr-13.5Mo	Smls. pipe & tube	SB-622	...	N06022	Solution ann.	...	43
40	55Ni-21Cr-13.5Mo	Wld. tube	SB-626	...	N06022	Solution ann.	...	43
41	59Ni-23Cr-16Mo	Wld. fittings	SB-366	...	N06059	Solution ann.	...	43
42	59Ni-23Cr-16Mo	Smls. fittings	SB-366	...	N06059	Solution ann.	...	43
43	59Ni-23Cr-16Mo	Wld. fittings	SB-366	...	N06059	Solution ann.	...	43
44	59Ni-23Cr-16Mo	Forged fittings	SB-462	...	N06059	Solution ann.	...	43
45	59Ni-23Cr-16Mo	Forgings	SB-564	...	N06059	Solution ann.	...	43

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	50	10	NP	800	NFN-1	G2, G4
2	50	12	NP	800	NFN-1	E1, G4
3	50	12	NP	800	NFN-1	E1, G4
4	50	12	NP	800	NFN-1	E1, G4
5	70	25	800	800	NFN-3	G1, G2, G4
6	70	25	800	800	NFN-3	G1, G4
7	70	25	800	800	NFN-3	G1, G2, G4
8	70	28	800	800	NFN-3	G1, G4
9	70	28	800	800	NFN-3	G1, G4
10	70	28	800	800	NFN-3	G1, G4
11	75	30	800	NP	NFN-3	E1, G1
12	75	40	800	800	NFN-3	E1, G1, G4
13	75	40	800	NP	NFN-3	E1, G1
14	85	55	500	800	NFN-3	E4, G1, G4, W1
15	85	55	500	NP	NFN-3	G1
16	70	25	800	800	NFN-3	G1, G2, G4
17	75	35	800	NP	NFN-3	G1
18	95	35	800	800	NFN-15	G1, G4
19	95	35	800	800	NFN-15	G1, G4
20	95	35	800	800	NFN-15	G1, G2, G4
21	100	40	800	NP	NFN-15	G1
22	100	40	NP	800	NFN-15	G1, G4, G5
23	100	40	800	800	NFN-15	G1, G4
24	100	40	800	NP	NFN-15	G1
25	100	40	NP	800	NFN-15	G1, G4, G5
26	85	30	NP	800	NFN-11	G1, G2, G4
27	85	30	NP	800	NFN-11	G1, G4
28	90	35	NP	800	NFN-11	G1, G2, G4
29	90	35	NP	800	NFN-11	G1, G4
30	90	35	NP	800	NFN-11	G1, G4, G5
31	90	35	NP	800	NFN-11	G1, G4
32	90	35	NP	800	NFN-11	G1, G4, G5
33	100	45	800	800	NFN-10	G1
34	100	45	800	800	NFN-10	G1
35	100	45	800	800	NFN-10	G1
36	100	45	800	800	NFN-10	G1
37	100	45	800	800	NFN-10	G1
38	100	45	800	800	NFN-10	G1
39	100	45	800	800	NFN-10	G1
40	100	45	800	800	NFN-10	G1
41	100	45	800	NP	NFN-14	G1, G4
42	100	45	800	800	NFN-14	G1, G4
43	100	45	NP	800	NFN-14	G1, G4, G5
44	100	45	800	800	NFN-14	G1, G4
45	100	45	800	800	NFN-14	G1, G4

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	6.7	6.5	6.4	6.3	6.3	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.1	6.0
2	8.0	7.8	7.7	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.4	7.2
3	8.0	7.8	7.7	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.4	7.2
4	8.0	7.8	7.7	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.4	7.2
5	16.7	15.3	14.6	14.0	13.6	13.3	13.2	13.1	13.1	13.1	13.1	13.1	13.0	12.9	12.7 (23)
6	16.7	15.3	14.6	14.0	13.6	13.3	13.2	13.1	13.1	13.1	13.1	13.1	13.0	12.9	12.7
7	16.7	15.3	14.6	14.0	13.6	13.3	13.2	13.1	13.1	13.1	13.1	13.1	13.0	12.9	12.7
8	18.7	17.2	16.4	15.7	15.2	14.9	14.7	14.7	14.7	14.7	14.7	14.7	14.6	14.5	14.3
9	18.7	17.2	16.4	15.7	15.2	14.9	14.7	14.7	14.7	14.7	14.7	14.7	14.6	14.5	14.3
10	18.7	17.2	16.4	15.7	15.2	14.9	14.7	14.7	14.7	14.7	14.7	14.7	14.6	14.5	14.3
11	20.0	19.7	19.4	19.0	18.6	18.2	17.9	17.7	17.6	17.5	17.3	17.2	17.0	16.8	15.2 (23)
12	25.0	25.0	25.0	25.0	24.8	24.3	23.9	23.7	23.4	23.3	23.1	22.9	22.7	20.9	20.3
13	25.0	25.0	25.0	25.0	24.8	24.3	23.9	23.7	23.4	23.3	23.1	22.9	22.7	20.9	20.3 (23)
14	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.2	27.9	27.4	26.6	18.0	12.7
15	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	...	...	...	...	...	...
16	16.7	15.3	14.6	14.0	13.6	13.3	13.2	13.1	13.1	13.1	13.1	13.1	13.0	12.9	12.7
17	23.3	...	20.6	...	19.2	...	18.5	...	18.5	...	18.5	18.5	18.5	18.2	17.6
18	23.3	21.9	21.0	20.1	19.2	18.4	17.7	17.1	16.5	16.1	15.7	15.3	15.1	14.9	14.7
19	23.3	21.9	21.0	20.1	19.2	18.4	17.7	17.1	16.5	16.1	15.7	15.3	15.1	14.9	14.7
20	23.3	21.9	21.0	20.1	19.2	18.4	17.7	17.1	16.5	16.1	15.7	15.3	15.1	14.9	14.7
21	26.7	25.0	24.0	22.9	22.0	21.1	20.3	19.5	18.9	18.4	17.9	17.5	17.2	17.0	16.8
22	22.7	21.3	20.4	19.5	18.7	17.9	17.2	16.6	16.1	15.6	15.2	14.9	14.6	14.4	14.3
23	26.7	25.0	24.0	22.9	22.0	21.1	20.3	19.5	18.9	18.4	17.9	17.5	17.2	17.0	16.8
24	26.7	25.0	24.0	22.9	22.0	21.1	20.3	19.5	18.9	18.4	17.9	17.5	17.2	17.0	16.8
25	22.7	21.3	20.4	19.5	18.7	17.9	17.2	16.6	16.1	15.6	15.2	14.9	14.6	14.4	14.3
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.5	19.2	19.0	18.8	18.7
27	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.5	19.2	19.0	18.8	18.7
28	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.7	22.4	22.2	22.0	21.8
29	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.7	22.4	22.2	22.0	21.8
30	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.6	19.3	19.1	18.8	18.7	18.5
31	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.7	22.4	22.2	22.0	21.8
32	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.6	19.3	19.1	18.8	18.7	18.5
33	30.0	...	30.0	...	30.0	...	30.0	...	29.0	...	27.6	27.0	26.5	26.1	25.7
34	30.0	...	30.0	...	30.0	...	30.0	...	29.0	...	27.6	27.0	26.5	26.1	25.7
35	30.0	...	30.0	...	30.0	...	30.0	...	29.0	...	27.6	27.0	26.5	26.1	25.7
36	30.0	...	30.0	...	30.0	...	30.0	...	29.0	...	27.6	27.0	26.5	26.1	25.7
37	30.0	...	30.0	...	30.0	...	30.0	...	29.0	...	27.6	27.0	26.5	26.1	25.7
38	25.5	...	25.5	...	25.5	...	25.5	...	24.7	...	23.5	23.0	22.5	22.2	21.8
39	30.0	...	30.0	...	30.0	...	30.0	...	29.0	...	27.6	27.0	26.5	26.1	25.7
40	25.5	...	25.5	...	25.5	...	25.5	...	24.7	...	23.5	23.0	22.5	22.2	21.8
41	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
42	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
43	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	24.6	23.9	23.2	22.5	21.8
44	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
45	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7

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Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P.No.
1	59Ni-23Cr-16Mo	Bar, rod	SB-574	...	N06059	Solution ann.	...	43
2	59Ni-23Cr-16Mo	Plate, sheet, strip	SB-575	...	N06059	Solution ann.	...	43
3	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.	...	43
4	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.	...	43
5	59Ni-23Cr-16Mo	Smls. pipe & tube	SB-622	...	N06059	Solution ann.	...	43
6	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.	...	43
7	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.	...	43
8	61Ni-16Mo-16Cr	Rod	SB-574	...	N06455	Solution ann.	...	43
9	61Ni-16Mo-16Cr	Plate, sheet, strip	SB-575	...	N06455	Solution ann.	...	43
10	61Ni-16Mo-16Cr	Wld. pipe	SB-619	...	N06455	Solution ann.	...	43
11	61Ni-16Mo-16Cr	Wld. pipe & tube	SB-622	...	N06455	Solution ann.	...	43
12	61Ni-16Mo-16Cr	Wld. tube	SB-626	...	N06455	Solution ann.	...	43
13	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin.	>5 O.D.	43
14	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold worked/ann.	>5 O.D.	43
15	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed	...	43
16	72Ni-15Cr-8Fe	Bar, rod	SB-166	...	N06600	Annealed	...	43
17	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold worked/ann.	≤5 O.D.	43
18	72Ni-15Cr-8Fe	Plate	SB-168	...	N06600	Annealed	...	43
19	72Ni-15Cr-8Fe	Forgings	SB-564	...	N06600	Annealed	...	43
20	72Ni-15Cr-8Fe	Wld. tube	SB-516	...	N06600	Cold drawn/ann.	≤4½ O.D.	43
21	72Ni-15Cr-8Fe	Wld. pipe	SB-517	...	N06600	Cold drawn/ann.	≤4½ O.D.	43
22	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed	¼ < O.D. ≤ 7/8	43
(23) 23	60Ni-22Cr-9Mo-3.5Cb	Bar, rod	SB-446	...	N06625	Annealed	4 < t ≤ 10	43
24	60Ni-22Cr-9Mo-3.5Cb	Plate, sheet	SB-443	...	N06625	Hot rolled/ann.	≤2.75	43
(23) 25	60Ni-22Cr-9Mo-3.5Cb	Plate	SB-443	...	N06625	Cold rolled/ann.	≤0.375	43
26	60Ni-22Cr-9Mo-3.5Cb	Smls. pipe & tube	SB-444	...	N06625	Annealed	...	43
27	60Ni-22Cr-9Mo-3.5Cb	Bar, rod	SB-446	...	N06625	Annealed	≤4	43
28	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Hot worked/ann.	>5 O.D.	43
29	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold worked/ann.	>5 O.D.	43
30	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Hot worked/ann.	≤5 O.D.	43
31	58Ni-29Cr-9Fe	Smls. tube	SB-163	...	N06690	Annealed	...	43
32	58Ni-29Cr-9Fe	Plate	SB-168	...	N06690	Annealed	...	43
33	58Ni-29Cr-9Fe	Forgings	SB-564	...	N06690	Annealed	...	43
34	58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Cold worked/ann.	...	43
35	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold worked/ann.	≤5 O.D.	43
36	58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Hot worked	...	43
37	58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Hot worked/ann.	...	43
38	58Ni-29Cr-9Fe	Smls. tube	SB-163	...	N06690	Annealed	¼ < O.D. ≤ 7/8	43
39	35Ni-19Cr-1¼Si	Bar	SB-511	...	N08330	Annealed	...	46
40	35Ni-19Cr-1¼Si	Smls. & wld. pipe	SB-535	...	N08330	Annealed	...	46
41	35Ni-19Cr-1¼Si	Plate, sheet, strip	SB-536	...	N08330	Annealed	...	46
42	42Fe-33Ni-21Cr	Smls. tube	SB-163	...	N08800	Annealed	...	45
43	42Fe-33Ni-21Cr	Smls. pipe & tube	SB-407	...	N08800	Annealed	...	45
44	42Fe-33Ni-21Cr	Plate	SB-409	...	N08800	Annealed	...	45
45	42Fe-33Ni-21Cr	Wld. pipe	SB-514	...	N08800	Annealed	...	45

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	100	45	800	800	NFN-14	G1, G4
2	100	45	800	800	NFN-14	G1, G4
3	100	45	800	NP	NFN-14	G1, G4
4	100	45	NP	800	NFN-14	G1, G4, G5
5	100	45	800	800	NFN-14	G1, G4
6	100	45	800	NP	NFN-14	G1, G4
7	100	45	NP	800	NFN-14	G1, G4, G5
8	100	40	NP	800	NFN-14	G1, G2, G4
9	100	40	NP	800	NFN-14	G1, G4
10	100	40	NP	800	NFN-14	G1, G4, G5
11	100	40	NP	800	NFN-14	G1, G4
12	100	40	NP	800	NFN-14	G1, G4, G5
13	75	25	800	NP	NFN-4	G1
14	80	30	800	800	NFN-4	G1, G4
15	80	35	800	800	NFN-4	G1, G4
16	80	35	800	800	NFN-4	G1, G2, G4
17	80	35	800	800	NFN-4	G1, G4
18	80	35	800	800	NFN-4	G1, G4
19	80	35	800	800	NFN-4	G1, G2, G4
20	80	35	NP	800	NFN-4	G1, G4
21	80	35	NP	800	NFN-4	G1, G4
22	80	40	800	NP	NFN-21	G1, G3, S1
23	110	50	800	NP	NFN-17	...
24	110	55	800	NP	NFN-17	...
25	110	55	800	NP	NFN-17	...
26	120	60	800	NP	NFN-17	...
27	120	60	800	NP	NFN-17	...
28	75	25	800	NP	NFN-4	G1
29	85	30	800	NP	NFN-4	G1
30	85	30	800	NP	NFN-4	G1
31	85	35	800	NP	NFN-4	G1
32	85	35	800	NP	NFN-4	G1
33	85	35	800	NP	NFN-4	G1
34	85	35	800	NP	NFN-4	G1
35	85	35	800	NP	NFN-4	G1
36	85	35	800	NP	NFN-4	G1
37	85	35	800	NP	NFN-4	G1
38	85	40	800	NP	NFN-21	G1, G3, S1
39	70	30	NP	800	NFN-13	G1, G2, G4
40	70	30	NP	800	NFN-13	G1, G4, G5
41	70	30	NP	800	NFN-13	G1, G4
42	75	30	800	800	NFN-8	G1, G4
43	75	30	800	800	NFN-8	G1, G4
44	75	30	800	800	NFN-8	G1, G4
45	75	30	NP	800	NFN-8	G1, G4

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
2	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
3	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
4	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	24.6	23.9	23.2	22.5	21.8
5	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
6	30.0	...	30.0	...	30.0	...	30.0	...	30.0	...	28.9	28.1	27.3	26.5	25.7
7	25.5	...	25.5	...	25.5	...	25.5	...	25.5	...	24.6	23.9	23.2	22.5	21.8
8	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8
9	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8
10	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.5	22.2	21.9
11	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8
12	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.5	22.2	21.9
13	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
15	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3
16	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3
17	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3
18	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3
19	23.3	...	23.3	...	23.3	...	23.3	...	23.3	...	23.3	23.3	23.3	23.3	23.3
20	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.8	19.8	19.8	19.8	19.8
21	19.8	...	19.8	...	19.8	...	19.8	...	19.8	...	19.8	19.8	19.8	19.8	19.8
22	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.7	26.7	26.7
23	33.3	...	32.1	...	31.2	...	30.3	...	29.4	...	28.6	28.3	27.9	27.6	27.4 (23)
24	36.7	...	35.3	...	34.3	...	33.3	...	32.4	...	31.5	31.1	30.7	30.4	30.1
25	36.7	...	35.3	...	34.3	...	33.3	...	32.4	...	31.5	31.1	30.7	30.4	30.1 (23)
26	40.0	...	38.5	...	37.4	...	36.3	...	35.3	...	34.4	33.9	33.5	33.2	32.9
27	40.0	...	38.5	...	37.4	...	36.3	...	35.3	...	34.4	33.9	33.5	33.2	32.9
28	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7
29	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
30	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
31	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
32	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
33	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
34	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
35	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
36	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
37	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3
38	26.7	...	26.7	...	26.7	...	26.7	...	26.7	...	26.7	26.7	26.6	26.5	26.4
39	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.4	18.9	18.5	18.1	17.7	17.4
40	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.1	15.7	15.4	15.1	14.8
41	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.4	18.9	18.5	18.1	17.7	17.4
42	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0
43	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0
44	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0
45	17.0	...	17.0	...	17.0	...	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0

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Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P.No.
1	42Fe-33Ni-21Cr	Wld. tube	SB-515	...	N08800	Annealed	...	45
2	42Fe-33Ni-21Cr	Forgings	SB-564	...	N08800	Annealed	...	45
3	42Fe-33Ni-21Cr	Bar, rod	SB-408	...	N08800	Hot fin.	...	45
4	42Fe-33Ni-21Cr	Smls. tube	SB-163	...	N08800	Annealed	$\frac{1}{4} < O.D. \leq \frac{7}{8}$	45
5	42Fe-33Ni-21Cr	Smls. tube	SB-163	...	N08800	Cold worked	...	45
6	42Fe-33Ni-21Cr	Smls. tube	SB-163	...	N08810	Annealed	...	45
7	42Fe-33Ni-21Cr	Smls. pipe & tube	SB-407	...	N08810	Annealed	...	45
8	42Fe-33Ni-21Cr	Bar, rod	SB-408	...	N08810	Annealed	...	45
9	42Fe-33Ni-21Cr	Plate	SB-409	...	N08810	Annealed	...	45
10	42Fe-33Ni-21Cr	Wld. pipe	SB-514	...	N08810	Annealed	...	45
11	42Fe-33Ni-21Cr	Wld. tube	SB-515	...	N08810	Annealed	...	45
12	42Fe-33Ni-21Cr	Forgings	SB-564	...	N08810	Annealed	...	45
13	42Ni-21.5Cr-3Mo-2.3Cu	Smls. tube	SB-163	...	N08825	Annealed	...	45
14	42Ni-21.5Cr-3Mo-2.3Cu	Smls. pipe & tube	SB-423	...	N08825	Annealed	...	45
15	42Ni-21.5Cr-3Mo-2.3Cu	Plate, sheet, strip	SB-424	...	N08825	Annealed	...	45
16	42Ni-21.5Cr-3Mo-2.3Cu	Bar, rod	SB-425	...	N08825	Annealed	...	45
17	62Ni-28Mo-5Fe	Plate, strip	SB-333	...	N10001	Solution ann.	$\frac{3}{16} \leq t \leq 2\frac{1}{2}$	44
18	62Ni-28Mo-5Fe	Wld. pipe	SB-619	...	N10001	Solution ann.	...	44
19	62Ni-28Mo-5Fe	Smls. pipe & tube	SB-622	...	N10001	Solution ann.	...	44
20	62Ni-28Mo-5Fe	Wld. tube	SB-626	...	N10001	Solution ann.	...	44
21	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Solution ann.	$1\frac{1}{2} < t \leq 3\frac{1}{2}$	44
22	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Solution ann.	$\frac{5}{16} \leq t \leq 1\frac{1}{2}$	44
23	62Ni-28Mo-5Fe	Plate, strip	SB-333	...	N10001	Solution ann.	$< \frac{3}{16}$	44
24	70Ni-16Mo-7Cr-5Fe	Plate, sheet, strip	SB-434	...	N10003	Annealed	$< 2\frac{1}{2}$	44
25	70Ni-16Mo-7Cr-5Fe	Rod	SB-573	...	N10003	Solution ann.	...	44
26	54Ni-16Mo-15Cr	Smls. fittings	SB-366	...	N10276	Solution ann.	...	43
27	54Ni-16Mo-15Cr	Wld. fittings	SB-366	...	N10276	Solution ann.	...	43
28	54Ni-16Mo-15Cr	Forgings	SB-462	...	N10276	Solution ann.	...	43
29	54Ni-16Mo-15Cr	Rod	SB-574	...	N10276	Solution ann.	...	43
30	54Ni-16Mo-15Cr	Plate, sheet, strip	SB-575	...	N10276	Solution ann.	...	43
31	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.	...	43
32	54Ni-16Mo-15Cr	Smls. pipe & tube	SB-622	...	N10276	Solution ann.	...	43
33	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.	...	43
34	65Ni-28Mo-2Fe	Plate, strip	SB-333	...	N10665	Solution ann.	...	44
35	65Ni-28Mo-2Fe	Rod	SB-335	...	N10665	Solution ann.	...	44
36	65Ni-28Mo-2Fe	Smls. fittings	SB-366	...	N10665	Solution ann.	...	44
37	65Ni-28Mo-2Fe	Wld. fittings	SB-366	...	N10665	Solution ann.	...	44
38	65Ni-28Mo-2Fe	Forgings	SB-462	...	N10665	Solution ann.	...	44
39	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Solution ann.	...	44
40	65Ni-28Mo-2Fe	Smls. pipe & tube	SB-622	...	N10665	Solution ann.	...	44
41	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Solution ann.	...	44
(23) 42	Ti	Plate, sheet, strip	SB-265	1	R50250	Annealed	...	51
(23) 43	Ti	Bar, billet	SB-348	1	R50250	Annealed	...	51
(23) 44	Ti	Forgings	SB-381	1	R50250	Annealed	...	51
(23) 45	Ti	Smls. tube	SB-338	1	R50250	Smls. ann.	...	51

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	75	30	NP	800	NFN-8	G1, G4
2	75	30	800	800	NFN-8	G1, G2, G4
3	75	30	800	800	NFN-8	G1, G2, G4
4	75	40	800	NP	NFN-8	G1, G3, S1
5	83	47	650	NP	NFN-23	G1
6	65	25	800	800	NFN-9	G1, G4
7	65	25	800	800	NFN-9	G1, G4
8	65	25	800	800	NFN-9	G1, G2, G4
9	65	25	800	800	NFN-9	G1, G4
10	65	25	NP	800	NFN-9	G1, G4, G5
11	65	25	NP	800	NFN-9	G1, G4, G5
12	65	25	800	800	NFN-9	G1, G2, G4
13	85	35	800	800	NFN-7	G1, G4
14	85	35	NP	800	NFN-7	G1, G4
15	85	35	NP	800	NFN-7	G4
16	85	35	800	800	NFN-7	G2, G4
17	100	45	NP	800	NFN-5	G1, G4
18	100	45	NP	800	NFN-5	G1, G4, G5
19	100	45	NP	800	NFN-5	G1, G4
20	100	45	NP	800	NFN-5	G1, G4, G5
21	100	46	NP	800	NFN-5	G1, G2, G4
22	115	46	NP	800	NFN-5	G1, G2, G4
23	115	50	NP	800	NFN-5	G1, G4
24	100	40	NP	800	NFN-6	G4
25	100	40	NP	800	NFN-6	G1, G2, G4
26	100	41	NP	800	NFN-10	G1, G4
27	100	41	NP	800	NFN-10	G1, G4, G5
28	100	41	NP	800	NFN-10	G1, G4
29	100	41	NP	800	NFN-10	G1, G2, G4
30	100	41	NP	800	NFN-10	G1, G4
31	100	41	NP	800	NFN-10	G1, G4, G5
32	100	41	NP	800	NFN-10	G1, G4
33	100	41	NP	800	NFN-10	G1, G4, G5
34	110	51	NP	800	NFN-16	G1, G4
35	110	51	NP	800	NFN-16	G1, G2, G4
36	110	51	NP	800	NFN-16	G1, G4
37	110	51	NP	800	NFN-16	G1, G4, G5
38	110	51	NP	800	NFN-16	G1, G4
39	110	51	NP	800	NFN-16	G1, G4, G5
40	110	51	NP	800	NFN-16	G1, G4
41	110	51	NP	800	NFN-16	G1, G4, G5
42	35	25	NP	600	NFT-3	...
43	35	25	NP	600	NFT-3	...
44	35	25	NP	600	NFT-3	...
45	35	25	NP	600	NFT-3	...

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	17.0	...	17.0	...	17.0	...	17.0	...	17.0	...	17.0	17.0	17.0	17.0	17.0
2	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0
3	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0
4	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	24.9	24.8	24.8	24.7	24.6
5	27.7	...	27.7	...	27.7	...	27.5	...	26.9	...	26.6	26.6	...	...	...
6	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0
7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0
8	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0
9	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0
10	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.0	13.7	13.3	13.0	12.8
11	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.0	13.7	13.3	13.0	12.8
12	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0
13	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0
14	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0
15	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0
16	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0
17	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9
18	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4
19	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9
20	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4
21	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.5
22	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.5
23	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.2
24	26.7	25.5	24.6	23.6	22.7	21.8	21.1	20.4	20.0	19.6	19.3	19.1	18.9	18.7	18.4
25	26.7	25.5	24.6	23.6	22.7	21.8	21.1	20.4	20.0	19.6	19.3	19.1	18.9	18.7	18.4
26	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1
27	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.8	22.1	21.5	20.9	20.4	20.0	19.6
28	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1
29	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1
30	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1
31	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.8	22.1	21.5	20.9	20.4	20.0	19.6
32	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1
33	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.8	22.1	21.5	20.9	20.4	20.0	19.6
34	34.0	...	34.0	...	34.0	...	34.0	...	34.0	...	34.0	34.0	34.0	34.0	34.0
35	34.0	...	34.0	...	34.0	...	34.0	...	34.0	...	34.0	34.0	34.0	34.0	34.0
36	34.0	...	34.0	...	34.0	...	34.0	...	34.0	...	34.0	34.0	34.0	34.0	34.0
37	28.9	...	28.9	...	28.9	...	28.9	...	28.9	...	28.9	28.9	28.9	28.9	28.9
38	34.0	...	34.0	...	34.0	...	34.0	...	34.0	...	34.0	34.0	34.0	34.0	34.0
39	28.9	...	28.9	...	28.9	...	28.9	...	28.9	...	28.9	28.9	28.9	28.9	28.9
40	34.0	...	34.0	...	34.0	...	34.0	...	34.0	...	34.0	34.0	34.0	34.0	34.0
41	28.9	...	28.9	...	28.9	...	28.9	...	28.9	...	28.9	28.9	28.9	28.9	28.9
42	11.7	10.9	9.6	8.6	7.7	7.0	6.4	5.9	5.2	4.7	4.2	...	...	...	(23)
43	11.7	10.9	9.6	8.6	7.7	7.0	6.4	5.9	5.2	4.7	4.2	...	...	...	(23)
44	11.7	10.9	9.6	8.6	7.7	7.0	6.4	5.9	5.2	4.7	4.2	...	...	...	(23)
45	11.7	10.9	9.6	8.6	7.7	7.0	6.4	5.9	5.2	4.7	4.2	...	...	...	(23)

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Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/ Thickness, in.	P-No.
(23) 1	Ti	Smls. pipe	SB-861	1	R50250	Smls. ann.	...	51
(23) 2	Ti	Wld. tube	SB-338	1	R50250	Wld. ann.	...	51
(23) 3	Ti	Wld. pipe	SB-862	1	R50250	Wld. ann.	...	51
(23) 4	Ti	Plate, sheet, strip	SB-265	2	R50400	Annealed	...	51
(23) 5	Ti	Bar, billet	SB-348	2	R50400	Annealed	...	51
(23) 6	Ti	Forgings	SB-381	2	R50400	Annealed	...	51
(23) 7	Ti	Smls. tube	SB-338	2	R50400	Smls. ann.	...	51
(23) 8	Ti	Smls. pipe	SB-861	2	R50400	Smls. ann.	...	51
(23) 9	Ti	Wld. tube	SB-338	2	R50400	Wld. ann.	...	51
(23) 10	Ti	Wld. pipe	SB-862	2	R50400	Wld. ann.	...	51
(23) 11	Ti	Plate, sheet, strip	SB-265	3	R50550	Annealed	...	52
(23) 12	Ti	Bar, billet	SB-348	3	R50550	Annealed	...	52
(23) 13	Ti	Forgings	SB-381	3	R50550	Annealed	...	52
(23) 14	Ti	Smls. tube	SB-338	3	R50550	Smls. ann.	...	52
(23) 15	Ti	Smls. pipe	SB-861	3	R50550	Smls. ann.	...	52
(23) 16	Ti	Wld. tube	SB-338	3	R50550	Wld. ann.	...	52
(23) 17	Ti	Wld. pipe	SB-862	3	R50550	Wld. ann.	...	52
(23) 18	Ti-Pd	Plate, sheet, strip	SB-265	7	R52400	Annealed	...	51
(23) 19	Ti-Pd	Bar, billet	SB-348	7	R52400	Annealed	...	51
(23) 20	Ti-Pd	Forgings	SB-381	7	R52400	Annealed	...	51
(23) 21	Ti-Pd	Smls. tube	SB-338	7	R52400	Smls. ann.	...	51
(23) 22	Ti-Pd	Smls. pipe	SB-861	7	R52400	Smls. ann.	...	51
(23) 23	Ti-Pd	Wld. tube	SB-338	7	R52400	Wld. ann.	...	51
(23) 24	Ti-Pd	Wld. pipe	SB-862	7	R52400	Wld. ann.	...	51
(23) 25	Ti-Pd	Plate, sheet, strip	SB-265	16	R52402	Annealed	...	51
(23) 26	Ti-0.3Mo-0.8Ni	Plate, sheet, strip	SB-265	12	R53400	Annealed	...	52
(23) 27	Ti-0.3Mo-0.8Ni	Bar, billet	SB-348	12	R53400	Annealed	...	52
(23) 28	Ti-0.3Mo-0.8Ni	Forgings	SB-381	F-12	R53400	Annealed	...	52
(23) 29	Ti-0.3Mo-0.8Ni	Smls. tube	SB-338	12	R53400	Smls. ann.	...	52
(23) 30	Ti-0.3Mo-0.8Ni	Smls. pipe	SB-861	12	R53400	Smls. ann.	...	52
(23) 31	Ti-0.3Mo-0.8Ni	Wld. tube	SB-338	12	R53400	Wld. ann.	...	52
(23) 32	Ti-0.3Mo-0.8Ni	Wld. pipe	SB-862	12	R53400	Wld. ann.	...	52
(23) 33	Ti-3Al-2.5V	Plate, sheet, strip	SB-265	9	R56320	Annealed	...	53
(23) 34	Ti-3Al-2.5V	Bar, billet	SB-348	9	R56320	Annealed	...	53
(23) 35	Ti-3Al-2.5V	Forgings	SB-381	F-9	R56320	Annealed	...	53
(23) 36	Ti-3Al-2.5V	Smls. & wld. tube	SB-338	9	R56320	Smls. ann.	...	53
(23) 37	Ti-3Al-2.5V	Wld. fittings	SB-363	9	R56320	Smls. ann.	...	53
(23) 38	Ti-3Al-2.5V	Smls. pipe	SB-861	9	R56320	Smls. ann.	...	53
(23) 39	Ti-3Al-2.5V	Smls. & wld. tube	SB-338	9	R56320	Wld. ann.	...	53
(23) 40	Ti-3Al-2.5V	Wld. fittings	SB-363	9	R56320	Wld. ann.	...	53
(23) 41	Ti-3Al-2.5V	Wld. pipe	SB-862	9	R56320	Wld. ann.	...	53

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted) (SPT = Supports Only)		External Pressure Chart No.	Notes
			III	VIII-2		
1	35	25	NP	600	NFT-3	...
2	35	25	NP	600	NFT-3	G5
3	35	25	NP	600	NFT-3	G5
4	50	40	NP	600	NFT-2	...
5	50	40	NP	600	NFT-2	...
6	50	40	NP	600	NFT-2	...
7	50	40	NP	600	NFT-2	...
8	50	40	NP	600	NFT-2	...
9	50	40	NP	600	NFT-2	G5
10	50	40	NP	600	NFT-2	G5
11	65	55	NP	600	NFT-1	...
12	65	55	NP	600	NFT-1	...
13	65	55	NP	600	NFT-1	...
14	65	55	NP	600	NFT-1	...
15	65	55	NP	600	NFT-1	...
16	65	55	NP	600	NFT-1	G5
17	65	55	NP	600	NFT-1	G5
18	50	40	NP	600	NFT-2	...
19	50	40	NP	600	NFT-2	...
20	50	40	NP	600	NFT-2	...
21	50	40	NP	600	NFT-2	...
22	50	40	NP	600	NFT-2	...
23	50	40	NP	600	NFT-2	G5
24	50	40	NP	600	NFT-2	G5
25	50	40	NP	600	NFT-2	...
26	70	50	NP	600	NFT-5	...
27	70	50	NP	600	NFT-5	...
28	70	50	NP	600	NFT-5	...
29	70	50	NP	600	NFT-5	...
30	70	50	NP	600	NFT-5	...
31	70	50	NP	600	NFT-5	G5
32	70	50	NP	600	NFT-5	G5
33	90	70	600	NP	NFT-4	...
34	90	70	600	NP	NFT-4	...
35	90	70	600	NP	NFT-4	...
36	90	70	600	NP	NFT-4	...
37	90	70	600	NP	NFT-4	...
38	90	70	600	NP	NFT-4	...
39	90	70	600	NP	NFT-4	G5
40	90	70	600	NP	NFT-4	G5
41	90	70	600	NP	NFT-4	G5

Table 2B (Cont'd)
Section III, Division 1, Classes 1, MC, and CS; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2, Class 1 Maximum Allowable
Stress Values, S , for Nonferrous Materials

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
1	11.7	10.9	9.6	8.6	7.7	7.0	6.4	5.9	5.2	4.7	4.2	...	...	...	(23)
2	9.9	9.2	8.2	7.3	6.5	5.9	5.5	5.0	4.5	4.0	3.5	...	...	...	(23)
3	9.9	9.2	8.2	7.3	6.5	5.9	5.5	5.0	4.5	4.0	3.5	...	...	...	(23)
4	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
5	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
6	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
7	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
8	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
9	14.2	13.6	12.3	11.2	10.3	9.4	8.8	8.1	7.5	7.0	6.5	...	...	...	(23)
10	14.2	13.6	12.3	11.2	10.3	9.4	8.8	8.1	7.5	7.0	6.5	...	...	...	(23)
11	21.7	20.4	18.4	16.6	14.9	13.4	12.1	10.9	9.9	9.2	8.6	...	...	...	(23)
12	21.7	20.4	18.4	16.6	14.9	13.4	12.1	10.9	9.9	9.2	8.6	...	...	...	(23)
13	21.7	20.4	18.4	16.6	14.9	13.4	12.1	10.9	9.9	9.2	8.6	...	...	...	(23)
14	21.7	20.4	18.4	16.6	14.9	13.4	12.1	10.9	9.9	9.2	8.6	...	...	...	(23)
15	21.7	20.4	18.4	16.6	14.9	13.4	12.1	10.9	9.9	9.2	8.6	...	...	...	(23)
16	18.4	17.4	15.6	14.1	12.7	11.4	10.2	9.3	8.4	7.8	7.3	...	...	...	(23)
17	18.4	17.4	15.6	14.1	12.7	11.4	10.2	9.3	8.4	7.8	7.3	...	...	...	(23)
18	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
19	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
20	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
21	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
22	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
23	14.2	13.6	12.3	11.2	10.3	9.4	8.8	8.1	7.5	7.0	6.5	...	...	...	(23)
24	14.2	13.6	12.3	11.2	10.3	9.4	8.8	8.1	7.5	7.0	6.5	...	...	...	(23)
25	16.7	16.0	14.5	13.2	12.1	11.1	10.3	9.6	8.9	8.2	7.6	...	...	...	(23)
26	23.3	23.3	21.8	20.3	18.9	17.7	16.7	15.9	15.2	14.8	14.4	...	...	...	(23)
27	23.3	23.3	21.8	20.3	18.9	17.7	16.7	15.9	15.2	14.8	14.4	...	...	...	(23)
28	23.3	23.3	21.8	20.3	18.9	17.7	16.7	15.9	15.2	14.8	14.4	...	...	...	(23)
29	23.3	23.3	21.8	20.3	18.9	17.7	16.7	15.9	15.2	14.8	14.4	...	...	...	(23)
30	23.3	23.3	21.8	20.3	18.9	17.7	16.7	15.9	15.2	14.8	14.4	...	...	...	(23)
31	19.8	19.8	18.5	17.3	16.1	15.1	14.2	13.5	12.9	12.6	12.2	...	...	...	(23)
32	19.8	19.8	18.5	17.3	16.1	15.1	14.2	13.5	12.9	12.6	12.2	...	...	...	(23)
33	30.0	30.0	28.9	27.7	26.4	25.0	23.5	22.2	21.1	20.5	20.1	...	...	...	(23)
34	30.0	30.0	28.9	27.7	26.4	25.0	23.5	22.2	21.1	20.5	20.1	...	...	...	(23)
35	30.0	30.0	28.9	27.7	26.4	25.0	23.5	22.2	21.1	20.5	20.1	...	...	...	(23)
36	30.0	30.0	28.9	27.7	26.4	25.0	23.5	22.2	21.1	20.5	20.1	...	...	...	(23)
37	30.0	30.0	28.9	27.7	26.4	25.0	23.5	22.2	21.1	20.5	20.1	...	...	...	(23)
38	30.0	30.0	28.9	27.7	26.4	25.0	23.5	22.2	21.1	20.5	20.1	...	...	...	(23)
39	25.5	25.5	24.5	23.5	22.4	21.2	20.0	18.9	18.0	17.4	17.1	...	...	...	(23)
40	25.5	25.5	24.5	23.5	22.4	21.2	20.0	18.9	18.0	17.4	17.1	...	...	...	(23)
41	25.5	25.5	24.5	23.5	22.4	21.2	20.0	18.9	18.0	17.4	17.1	...	...	...	(23)

NOTES TO TABLE 2B**GENERAL NOTES**

- (a) The following abbreviations are used: ann., annealed; fin., finished; rel., relieved; Smls., Seamless; and Wld., Welded.
- (b) An alternative typeface is used for stress values based on successful experience in service (see Notes E1 through E4).
- (c) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SB-407/SB-407M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SB-407 Grade N08800 shall be used when SB-407M Grade N08800 is used in construction.
- (d) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (e) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (f) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - EXPERIENCE CRITERION

- E1 For values at 800°F, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- E2 For values at 250°F and above, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- E3 For values at 400°F and above, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- E4 For values at 750°F and above, the design stress intensity values or maximum allowable stress values are based on successful experience in service.
- (23) E5 For values at 350°F and above, the design stress intensity values are based on successful experience in service.

NOTES - GENERAL REQUIREMENTS

- G1 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed $66\frac{2}{3}\%$ but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction. Table Y-2 lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give allowable stress values that will result in lower levels of permanent strain.
- G2 Use of external pressure charts for material in the form of bar stock is permitted for stiffening rings only.
- G3 SB-163 Supplementary Requirement S2 shall be met.
- G4 Stress values for 100°F may be used at temperatures down to -325°F without additional specification requirements.
- G5 A joint efficiency factor of 0.85 has been applied in arriving at the stress values for this material.
- G6 Maximum temperature for external pressure design not to exceed 350°F.
- G7 These alloys are occasionally subject to the hazard of stress corrosion cracking. Even though they are suitable for engineering use under a wide variety of corrosive conditions, with no particular hazard with respect to stress corrosion, the supplier of the material should be consulted before applying them.
- G8 Stress values for 100°F may be used at temperatures down to -452°F without additional specification requirements.
- G9 For stress relieved tempers (T451, T4510, T4511, T651, T6510, and T6511), stress values for materials in the basic temper shall be used.
- G10 Copper-silicon alloys are not always suitable when exposed to certain media and high temperature, particularly steam above 212°F. The user should satisfy him/herself that the alloy selected is satisfactory for the service for which it is to be used.

NOTES - SIZE REQUIREMENTS

- S1 Thickness ≤ 0.100 in.

NOTES - WELDING REQUIREMENTS

- W1 Welding except for seal welds is not permitted.
- W2 For welded construction, stress values for material of O temper shall be used.
- W3 The stress values given for this material are not applicable when either welding or thermal cutting is employed.

Table 3
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
Ferrous Materials							
1	Carbon steel	Bolting	SA-307	A	...	...	$\frac{1}{4} \leq t \leq 4$
2	Carbon steel	Bolting	SA-307	B	...	...	...
3	Carbon steel	Bolting	SA-449	1	K04200	...	$1\frac{1}{2} < t \leq 3$
4	Carbon steel	Bolting	SA-325	...	...	...	...
5	Carbon steel	Bolting	SA-325	1	K02706	...	$1\frac{1}{8} \leq t \leq 1\frac{1}{2}$
6	Carbon steel	Bolting	SA-449	1	K04200	...	$1 < t < 1\frac{1}{2}$
7	Carbon steel	Bolting	SA-354	BC	K04100	...	$2\frac{1}{2} < t \leq 4$
8	Carbon steel	Bolting	SA-325	1	K02706	...	$\frac{1}{2} \leq t \leq 1$
9	Carbon steel	Bolting	SA-449	1	K04200	...	≤ 1
10	Carbon steel	Bolting	SA-354	BC	K04100	...	$\frac{1}{4} < t \leq 2\frac{1}{2}$
11	Carbon steel	Bolting	SA-354	BD	K04100	...	$2\frac{1}{2} < t \leq 4$
12	Carbon steel	Bolting	SA-354	BD	K04100	...	$\frac{1}{4} < t \leq 2\frac{1}{2}$
13	C- $\frac{1}{4}$ Mo	Bolting	SA-320	L7A	G40370	...	$\leq 2\frac{1}{2}$
14	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4037	G40370	...	$\geq \frac{5}{8}$
15	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4042	G40420	...	$\geq \frac{5}{8}$
16	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4037	G40370	...	$\leq \frac{1}{2}$
17	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4042	G40420	...	$\leq \frac{1}{2}$
18	$\frac{3}{4}$ Cr	Bolting	SA-574	5137M	...	...	$\geq \frac{5}{8}$
19	$\frac{3}{4}$ Cr	Bolting	SA-574	51B37M	...	...	$\geq \frac{5}{8}$
20	$\frac{3}{4}$ Cr	Bolting	SA-574	5137M	...	...	$\leq \frac{1}{2}$
21	$\frac{3}{4}$ Cr	Bolting	SA-574	51B37M	...	...	$\leq \frac{1}{2}$
22	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	H41420	5	$2 < t \leq 4$
23	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	H41420	5	≤ 2
24	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	H41420	4	≤ 4
25	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	H41420	3	≤ 4
26	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	H41420	2	≤ 3
27	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	H41420	1	$\leq 1\frac{1}{2}$
28	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...	$4 < t \leq 7$
29	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7M	G41400	...	$\leq 2\frac{1}{2}$
30	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-320	L7M	G41400	...	$\leq 2\frac{1}{2}$
31	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...	$2\frac{1}{2} < t \leq 4$
32	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...	$\leq 2\frac{1}{2}$
33	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-320	L7	G41400	...	$\leq 2\frac{1}{2}$
34	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4137	G41370	...	$\geq \frac{5}{8}$
35	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4140	G41400	...	$\geq \frac{5}{8}$
36	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4142	G41420	...	$\geq \frac{5}{8}$
37	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4145	G41450	...	$\geq \frac{5}{8}$
38	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4137	G41370	...	$\leq \frac{1}{2}$
39	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4140	G41400	...	$\leq \frac{1}{2}$
40	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4142	G41420	...	$\leq \frac{1}{2}$
41	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4145	G41450	...	$\leq \frac{1}{2}$
42	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...	$4 < t \leq 8$
43	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...	$2\frac{1}{2} < t \leq 4$
44	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	5	$2 < t \leq 8$
45	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	5	≤ 2

Table 3
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
							Ferrous Materials
1	60	...	NP	450	NP	NP	G12
2	60	...	400	450	NP	450	...
3	90	58	700	650	650	650	...
4	105	81	650	650	650	NP	...
5	105	81	NP	650	650	650	...
6	105	81	700	700	700	650	...
7	115	99	650	650	650	650	...
8	120	92	NP	650	650	650	...
9	120	92	700	650	650	650	...
10	125	109	650	650	650	650	...
11	140	115	650	650	650	650	...
12	150	130	650	650	650	650	...
13	125	105	NP	650	650	650	W3
14	170	135	550	550	NP	550	G7, G11, W1
15	170	135	550	550	NP	550	G7, G11, W1
16	180	140	550	550	NP	550	G7, G11, W1
17	180	140	550	550	NP	550	G7, G11, W1
18	170	135	550	550	NP	NP	G7, G11, W1
19	170	135	550	550	NP	NP	G7, G11, W1
20	180	140	550	550	NP	NP	G7, G11, W1
21	180	140	550	550	NP	NP	G7, G11, W1
22	115	100	700	NP	NP	NP	...
23	120	105	700	NP	NP	NP	...
24	135	120	700	NP	NP	NP	...
25	145	130	700	700	NP	650	...
26	155	140	700	NP	NP	NP	...
27	165	150	700	NP	NP	NP	...
28	100	75	800	1000	800	650	T5
29	100	80	NP	1000	800	650	T5
30	100	80	NP	1000	800	650	T5
31	115	95	800	1000	800	650	T5
32	125	105	800	1000	800	650	T5
33	125	105	700	800	800	650	...
34	170	135	550	NP	NP	NP	G7, G11, W1
35	170	135	550	550	NP	550	G7, G11, W1
36	170	135	550	NP	NP	NP	G7, G11, W1
37	170	135	550	NP	NP	NP	G7, G11, W1
38	180	140	550	NP	NP	NP	G7, G11, W1
39	180	140	550	NP	NP	NP	G7, G11, W1
40	180	140	550	NP	NP	NP	G7, G11, W1
41	180	140	550	NP	NP	NP	G7, G11, W1
42	100	85	800	1100	800	650	T8
43	110	95	800	1100	800	650	T8
44	115	100	700	700	700	NP	...
45	120	105	700	700	700	NP	...

Table 3
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Ferrous Materials																	
1	7.0	...	7.0	...	7.0	...	7.0	7.0	...	...	...	...	...	...	...	...	...
2	7.0	...	7.0	...	7.0	...	7.0	7.0	...	...	...	...	...	...	...	...	...
3	14.5	14.5	14.5	...	14.5	...	14.5	...	14.5	14.5	14.5	14.5	14.5	...	...	...	...
4	20.2	...	20.2	...	20.2	...	20.2	...	20.2	...	20.2	20.2	...	...	...	...	...
5	20.2	20.2	20.2	...	20.2	...	20.2	...	20.2	20.2	20.2	20.2	...	...	...	...	...
6	20.2	...	20.2	...	20.2	...	20.2	...	20.2	...	20.2	20.2	20.2	...	...	...	...
7	23.0	23.0	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	23.0	...	...	...	...	...
8	23.0	23.0	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	23.0	...	...	...	...	...
9	23.0	23.0	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	23.0	23.0	...	...	...	...
10	25.0	25.0	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	...	...	...	...	...
11	28.0	28.0	28.0	...	28.0	...	28.0	...	28.0	...	28.0	28.0	...	...	...	...	...
12	30.0	30.0	30.0	...	30.0	...	30.0	...	30.0	30.0	30.0	30.0	...	...	...	...	...
13	25.0	25.0	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	...	...	...	...	...
14	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
15	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
16	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
17	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
18	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
19	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
20	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
21	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
22	23.0	...	23.0	...	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	...	...	...	...
23	24.0	...	24.0	...	24.0	...	24.0	...	24.0	...	24.0	24.0	24.0	...	...	...	...
24	27.0	...	27.0	...	27.0	...	27.0	...	27.0	...	27.0	27.0	27.0	...	...	...	...
25	29.0	...	29.0	...	29.0	...	29.0	...	29.0	...	29.0	29.0	29.0	...	...	...	...
26	31.0	...	31.0	...	31.0	...	31.0	...	31.0	...	31.0	31.0	31.0	...	...	...	...
27	33.0	...	33.0	...	33.0	...	33.0	...	33.0	...	33.0	33.0	33.0	...	...	...	...
28	18.8	18.8	18.8	...	18.8	...	18.8	...	18.8	18.8	18.8	18.8	18.8	18.8	18.0	16.3	12.5
29	20.0	20.0	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	18.5	16.3	12.5
30	20.0	20.0	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	18.5	16.3	12.5
31	23.0	23.0	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	23.0	23.0	22.2	20.0	16.3	12.5
32	25.0	25.0	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	23.6	21.0	16.3	12.5
33	25.0	25.0	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	23.6	21.0	...	...
34	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
35	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
36	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
37	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
38	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
39	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
40	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
41	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
42	20.0	20.0	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	18.8	16.7	...
43	22.0	22.0	22.0	...	22.0	...	22.0	...	22.0	...	22.0	22.0	22.0	22.0	21.0	18.5	...
44	23.0	...	23.0	...	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	...	...	...	...
45	24.0	...	24.0	...	24.0	...	24.0	...	24.0	...	24.0	24.0	24.0	...	...	...	...

Table 3
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials														
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	8.5	4.5	...	...	...	...	...	...	...	...	...	...	...	...	...
29	8.5	4.5	...	...	...	...	...	...	...	...	...	...	...	...	...
30	8.5	4.5	...	...	...	...	...	...	...	...	...	...	...	...	...
31	8.5	4.5	...	...	...	...	...	...	...	...	...	...	...	...	...
32	8.5	4.5	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	14.3	11.0	6.3	2.8	...	...	...	...	...	...	...	...	...	...	...
43	15.3	11.0	6.3	2.8	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
Ferrous Materials (Cont'd)							
1	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...	$\leq 2\frac{1}{2}$
2	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	4	≤ 6
3	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	3	≤ 6
4	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	2	≤ 4
5	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	1	≤ 4
6	5Cr- $\frac{1}{2}$ Mo	Bolting	SA-193	B5	K50100	...	≤ 4
7	12Cr-1Mo-V-W	Bolting	SA-437	B4C	K91352	...	...
8	12Cr-1Mo-V-W	Bolting	SA-437	B4B	K91352	...	...
9	13Cr	Bolting	SA-193	B6	S41000	...	≤ 4
10	17Cr-4Ni-4Cu	Bolting	SA-564	630	S17400	H1150	≤ 8
11	17Cr-4Ni-4Cu	Bolting	SA-564	630	S17400	H1100	≤ 8
12	17Cr-4Ni-4Cu	Bolting	SA-705	630	S17400	H1100	≤ 8
13	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	8740	G87400	...	$\geq \frac{5}{8}$
14	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	8740	G87400	...	$\leq \frac{1}{2}$
15	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-320	L43	G43400	...	≤ 4
16	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	4340	G43400	...	$\geq \frac{5}{8}$
17	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	4340	G43400	...	$\leq \frac{1}{2}$
(23) 18	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	5	≤ 6
(23) 19	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	5	$6 < t \leq 9\frac{1}{2}$
20	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	4	$\leq 9\frac{1}{2}$
21	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	3	$\leq 9\frac{1}{2}$
22	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	2	$\leq 9\frac{1}{2}$
23	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	1	≤ 8
(23) 24	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	5	≤ 6
(23) 25	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	5	$6 < t \leq 9\frac{1}{2}$
26	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	4	$\leq 9\frac{1}{2}$
27	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	3	$\leq 9\frac{1}{2}$
28	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	2	$\leq 9\frac{1}{2}$
29	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	1	≤ 8
30	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo-V	Bolting	SA-540	B24V	K24070	3	≤ 11
31	$3\frac{1}{2}$ Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-508	5	K42365	2	...
32	25Ni-15Cr-2Ti	Bolting	SA-453	660	S66286	A	...
33	25Ni-15Cr-2Ti	Bolting	SA-453	660	S66286	B	...
34	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	1	...
35	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	1	...
36	16Cr-12Ni-2Mo	Bolting	SA-320	B8MA	S31600	1A	...
(23) 37	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B	$2\frac{1}{2} < t \leq 3$
38	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
39	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
(23) 40	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B	$2 < t \leq 2\frac{1}{2}$
41	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$1 < t \leq 1\frac{1}{4}$
42	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$1 < t \leq 1\frac{1}{4}$
(23) 43	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B	≤ 2
44	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$\frac{3}{4} < t \leq 1$
45	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$\frac{3}{4} < t \leq 1$

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
Ferrous Materials (Cont'd)							
1	125	105	800	1100	800	650	T8
2	135	120	700	700	700	650	...
3	145	130	700	700	700	650	...
4	155	140	700	700	700	650	...
5	165	150	700	700	700	650	...
6	100	80	800	1200	800	650	T5
7	115	85	700	700	700	650	...
8	145	105	700	700	700	650	...
9	110	85	800	900	800	650	T5
10	135	105	NP	650	650	NP	G4
11	140	115	650	650	650	650	G4
12	140	115	650	650	650	650	G4
13	170	135	550	NP	NP	NP	G7, G11, W1
14	180	140	550	NP	NP	NP	G7, G11, W1
15	125	105	400	400	700	400	...
16	170	135	550	550	NP	NP	G7, G11, W1
17	180	140	550	550	NP	NP	G7, G11, W1
18	120	105	700	700	700	650	...
19	115	100	700	700	700	650	...
20	135	120	700	700	700	650	...
21	145	130	700	700	700	650	...
22	155	140	700	700	700	650	...
23	165	150	700	700	700	650	...
24	120	105	700	700	700	650	...
25	115	100	700	700	700	650	...
26	135	120	700	700	700	650	...
27	145	130	700	700	700	650	...
28	155	140	700	700	700	650	...
29	165	150	700	700	700	650	...
30	145	130	700	700	700	650	...
31	115	100	NP	100	100	100	...
32	130	85	800	1000	800	650	...
33	130	85	800	1000	800	650	...
34	75	30	800	1500	800	650	G5, G6, T11
35	75	30	400	800	800	100	...
36	75	30	NP	800	800	100	...
37	80	55	NP	1000	800	650	G8, G9
38	90	50	800	800	NP	650	G8
39	90	50	NP	800	800	100	G8, G9
40	90	65	NP	1000	800	650	G8, G9
41	95	65	800	800	NP	650	G8
42	95	65	NP	800	800	100	G8
43	95	75	NP	1000	800	650	G8, G9
44	100	80	800	800	NP	650	G8
45	100	80	NP	800	800	100	G8

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Ferrous Materials (Cont'd)																	
1	25.0	25.0	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	25.0	25.0	23.5	20.5
2	27.0	...	27.0	...	27.0	...	27.0	...	27.0	...	27.0	27.0	27.0	...	...	...	...
3	29.0	...	29.0	...	29.0	...	29.0	...	29.0	...	29.0	29.0	29.0	...	...	...	...
4	31.0	...	31.0	...	31.0	...	31.0	...	31.0	...	31.0	31.0	31.0	...	...	...	...
5	33.0	...	33.0	...	33.0	...	33.0	...	33.0	...	33.0	33.0	33.0	...	...	...	...
6	20.0	20.0	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	18.5	14.5	10.4
7	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	21.3	21.3	21.3	...	...	...	...
8	26.2	...	26.2	...	26.2	...	26.2	...	26.2	...	26.2	26.2	26.2	...	...	...	...
9	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	21.3	21.3	21.3	21.3	21.3	17.2	12.3
10	26.3	...	26.3	...	26.3	...	26.3	...	26.3	...	26.3	26.3	...	...	...	...	...
11	28.0	...	28.0	...	28.0	...	28.0	...	28.0	...	28.0	28.0	...	...	...	...	...
12	28.0	...	28.0	...	28.0	...	28.0	...	28.0	...	28.0	28.0	...	...	...	...	...
13	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
14	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
15	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	...	...	...	...
16	33.8	...	33.8	...	33.8	...	33.8	...	33.8	33.8	...	...	...	...	...	...	...
17	35.0	...	35.0	...	35.0	...	35.0	...	35.0	35.0	...	...	...	...	...	...	...
18	24.0	24.0	24.0	...	24.0	...	24.0	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
19	23.0	23.0	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	23.0	23.0	...	...	...	...
20	27.0	27.0	27.0	...	27.0	...	27.0	...	27.0	27.0	27.0	27.0	27.0	...	...	...	...
21	29.0	29.0	29.0	...	29.0	...	29.0	...	29.0	29.0	29.0	29.0	29.0	...	...	...	...
22	31.0	...	31.0	...	31.0	...	31.0	...	31.0	...	31.0	31.0	31.0	...	...	...	...
23	33.0	...	33.0	...	33.0	...	33.0	...	33.0	...	33.0	33.0	33.0	...	...	...	...
24	24.0	24.0	24.0	...	24.0	...	24.0	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
25	23.0	23.0	23.0	...	23.0	...	23.0	...	23.0	23.0	23.0	23.0	23.0	...	...	...	...
26	27.0	27.0	27.0	...	27.0	...	27.0	...	27.0	27.0	27.0	27.0	27.0	...	...	...	...
27	29.0	29.0	29.0	...	29.0	...	29.0	...	29.0	29.0	29.0	29.0	29.0	...	...	...	...
28	31.0	...	31.0	...	31.0	...	31.0	...	31.0	...	31.0	31.0	31.0	...	...	...	...
29	33.0	...	33.0	...	33.0	...	33.0	...	33.0	...	33.0	33.0	33.0	...	...	...	...
30	29.0	...	29.0	...	29.0	...	29.0	...	29.0	...	29.0	29.0	29.0	...	...	...	...
31	23.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	21.3	21.3	21.3	21.3	21.3	21.3	21.3
33	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	21.3	21.3	21.3	21.3	21.3	21.3	21.3
34	18.8	...	17.7	...	15.6	...	14.3	...	13.3	...	12.6	12.3	12.1	11.9	11.7	11.6	11.5
35	18.8	...	17.7	...	15.6	...	14.3	...	13.3	...	12.6	12.3	12.1	11.9	11.7	...	...
36	18.8	...	17.7	...	15.6	...	14.3	...	13.3	...	12.6	12.3	12.1	11.9	11.7	...	...
37	18.8	...	17.7	...	15.6	...	14.3	...	13.8	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8
38	18.8	...	17.7	...	15.6	...	14.3	...	13.3	...	12.6	12.5	12.5	12.5	12.5	...	...
39	18.8	...	17.7	...	15.6	...	14.3	...	13.3	...	12.6	12.5	12.5	12.5	12.5	...	...
40	18.8	...	17.7	...	16.3	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3
41	18.8	...	17.7	...	16.3	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	...	...
42	18.8	...	17.7	...	16.3	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	...	...
43	18.8	...	18.8	...	18.8	...	18.8	...	18.8	...	18.8	18.8	18.8	18.8	18.8	18.8	18.8
44	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	...	...
45	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)														
1	16.0	11.0	6.3	2.8	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	7.6	5.6	4.2	3.1	2.0	1.3	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	21.3	21.3	...	...	...	...	...	...	...	...	...	...	...	...	...
33	21.3	21.3	...	...	...	...	...	...	...	...	...	...	...	...	...
34	11.4	11.3	11.2	11.0	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	13.8	13.8	...	...	...	...	...	...	...	...	...	...	...	...	(23)
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	16.3	16.3	...	...	...	...	...	...	...	...	...	...	...	...	(23)
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	18.8	18.8	...	...	...	...	...	...	...	...	...	...	...	...	(23)
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
Ferrous Materials (Cont'd)							
1	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$\leq \frac{3}{4}$
2	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$\leq \frac{3}{4}$
3	16Cr-12Ni-2Mo-N	Bolting	SA-193	B8MNA	S31651	1A	...
4	18Cr-8Ni	Bolting	SA-193	B8	S30400	1	...
5	18Cr-8Ni	Bolting	SA-320	B8	S30400	1	...
6	18Cr-8Ni	Bolting	SA-320	B8A	S30400	1A	...
7	18Cr-8Ni	Bolting	SA-193	B8	S30400	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
8	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
9	18Cr-8Ni	Bolting	SA-193	B8	S30400	2	$1 < t \leq 1\frac{1}{4}$
10	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$1 < t \leq 1\frac{1}{4}$
11	18Cr-8Ni	Bolting	SA-193	B8	S30400	2	$\frac{3}{4} < t \leq 1$
12	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$\frac{3}{4} < t \leq 1$
13	18Cr-8Ni	Bolting	SA-193	B8	S30400	2	$\leq \frac{3}{4}$
14	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$\leq \frac{3}{4}$
15	18Cr-8Ni-N	Bolting	SA-193	B8NA	S30451	1A	...
16	18Cr-8Ni-Se	Bolting	SA-320	B8F	S30323	1	...
17	18Cr-8Ni-Se	Bolting	SA-320	B8FA	S30323	1A	...
18	18Cr-8Ni-4Si-N	Bolting	SA-193	B8S	S21800	...	...
19	18Cr-8Ni-4Si-N	Bolting	SA-193	B8SA	S21800	...	...
20	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	1	...
21	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	1	...
22	18Cr-10Ni-Cb	Bolting	SA-320	B8CA	S34700	1A	...
23	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
24	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
25	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2	$1 < t \leq 1\frac{1}{4}$
26	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$1 < t \leq 1\frac{1}{4}$
27	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2	$\frac{3}{4} < t \leq 1$
28	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$\frac{3}{4} < t \leq 1$
29	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2	$\leq \frac{3}{4}$
30	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$\leq \frac{3}{4}$
31	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	1	...
32	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	1	...
33	18Cr-10Ni-Ti	Bolting	SA-320	B8TA	S32100	1A	...
34	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
35	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
36	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2	$1 < t \leq 1\frac{1}{4}$
37	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$1 < t \leq 1\frac{1}{4}$
38	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2	$\frac{3}{4} < t \leq 1$
39	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$\frac{3}{4} < t \leq 1$
40	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2	$\leq \frac{3}{4}$
41	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$\leq \frac{3}{4}$
42	18Cr-11Ni	Bolting	SA-193	B8P	S30500	1	...
43	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$
44	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2	$1 < t \leq 1\frac{1}{4}$
45	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2	$\frac{3}{4} < t \leq 1$

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
Ferrous Materials (Cont'd)							
1	110	95	800	800	NP	650	G8
2	110	95	NP	800	800	100	G8
3	75	30	800	1000	800	650	G5
4	75	30	800	1500	800	650	G5, G6, T10
5	75	30	400	800	800	100	...
6	75	30	NP	800	800	100	...
7	100	50	NP	1000	800	650	G8, G9
8	100	50	NP	1000	800	100	G8
9	105	65	NP	1000	800	650	G8, G9
10	105	65	NP	1000	800	100	G8
11	115	80	NP	1000	800	650	G8, G9
12	115	80	NP	1000	800	100	G8
13	125	100	NP	1000	800	650	G8, G9
14	125	100	NP	1000	800	100	G8
15	75	30	800	1000	800	650	G5
16	75	30	400	400	400	100	...
17	75	30	NP	400	400	100	...
18	95	50	NP	950	800	650	...
19	95	50	NP	950	800	650	...
20	75	30	800	1500	800	650	G5, G6, T9
21	75	30	400	800	800	100	...
22	75	30	NP	800	800	100	...
23	100	50	NP	100	100	100	G8
24	100	50	NP	100	100	100	G8
25	105	65	NP	100	100	100	G8
26	105	65	NP	100	100	100	G8
27	115	80	NP	100	100	100	G8
28	115	80	NP	100	100	100	G8
29	125	100	NP	100	100	100	G8
30	125	100	NP	100	100	100	G8
31	75	30	800	1500	800	650	G5, G6, T9
32	75	30	400	800	800	100	...
33	75	30	NP	800	800	100	...
34	100	50	NP	1000	800	650	G8
35	100	50	NP	800	800	100	G8
36	105	65	NP	1000	800	650	G8
37	105	65	NP	800	800	100	G8
38	115	80	NP	1000	800	650	G8
39	115	80	NP	800	800	100	G8
40	125	100	NP	1000	800	650	G8
41	125	100	NP	800	800	100	G8
42	75	30	NP	1500	800	650	T10
43	100	50	NP	1000	800	650	G8
44	105	65	NP	1000	800	650	G8
45	115	80	NP	1000	800	650	G8

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Ferrous Materials (Cont'd)																	
1	22.0	...	22.0	...	22.0	...	22.0	...	22.0	...	22.0	22.0	22.0	22.0	22.0	...	...
2	22.0	...	22.0	...	22.0	...	22.0	...	22.0	...	22.0	22.0	22.0	22.0	22.0	...	...
3	18.8	...	17.8	...	16.3	...	15.2	...	14.2	...	13.4	13.1	12.8	12.5	12.3	12.0	11.8
4	18.8	...	16.7	...	15.0	...	13.8	...	12.9	...	12.1	12.0	11.8	11.5	11.2	11.0	10.8
5	18.8	...	16.7	...	15.0	...	13.8	...	12.9	...	12.1	12.0	11.8	11.5	11.2	...	...
6	18.8	...	16.7	...	15.0	...	13.8	...	12.9	...	12.1	12.0	11.8	11.5	11.2	...	...
7	18.8	...	16.7	...	15.0	...	13.8	...	12.9	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5
8	18.8	...	16.7	...	15.0	...	13.8	...	12.9	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5
9	18.8	...	16.7	...	16.3	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3
10	18.8	...	16.7	...	16.3	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3
11	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0
12	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0
13	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	25.0	25.0
14	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	25.0	25.0
15	18.8	...	16.5	...	14.4	...	12.9	...	12.0	...	11.4	11.2	11.0	10.8	10.6	10.4	10.2
16	18.8	...	15.0	...	13.6	...	12.6	...	...	...	...	...	...	...	...	...	...
17	18.8	...	15.0	...	13.6	...	12.6	...	...	...	...	...	...	...	...	...	...
18	23.8	...	23.4	...	21.8	...	19.7	...	18.5	...	17.6	17.3	17.1	16.9	16.7	16.7	16.7
19	23.8	...	23.4	...	21.8	...	19.7	...	18.5	...	17.6	17.3	17.1	16.9	16.7	16.7	16.7
20	18.8	...	17.9	...	16.4	...	15.5	...	15.0	...	14.3	14.1	13.8	13.7	13.6	13.5	13.5
21	18.8	...	17.9	...	16.4	...	15.5	...	15.0	...	14.3	14.1	13.8	13.7	13.6	...	...
22	18.8	...	17.9	...	16.4	...	15.5	...	15.0	...	14.3	14.1	13.8	13.7	13.6	...	...
23	18.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	18.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	18.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	18.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	25.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	25.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	18.8	...	17.8	...	16.5	...	15.3	...	14.3	...	13.5	13.3	12.9	12.7	12.5	12.4	12.3
32	18.8	...	17.8	...	16.5	...	15.3	...	14.3	...	13.5	13.3	12.9	12.7	12.5	...	...
33	18.8	...	17.8	...	16.5	...	15.3	...	14.3	...	13.5	13.3	12.9	12.7	12.5	...	...
34	18.8	...	17.8	...	16.5	...	15.3	...	14.3	...	13.5	13.3	12.9	12.7	12.5	12.5	12.5
35	18.8	...	17.8	...	16.5	...	15.3	...	14.3	...	13.5	13.3	12.9	12.7	12.5	...	...
36	18.8	...	17.8	...	16.5	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3
37	18.8	...	17.8	...	16.5	...	16.3	...	16.3	...	16.3	16.3	16.3	16.3	16.3	...	...
38	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0
39	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	...	...
40	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	25.0	25.0
41	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	...	...
42	18.8	...	16.7	...	15.0	...	13.8	...	12.9	...	12.1	12.0	11.8	11.5	11.2	11.0	10.8
43	18.8	...	18.8	...	18.8	...	18.8	...	18.8	...	18.8	18.8	18.8	18.8	18.7	18.3	18.0
44	18.8	...	18.8	...	18.8	...	18.8	...	18.8	...	18.8	18.8	18.8	18.8	18.8	18.8	18.8
45	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	20.0	20.0	20.0	20.0	20.0	20.0

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)														
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	11.6	11.4	...	...	...	...	...	...	...	...	...	...	...	...	...
4	10.6	10.4	10.1	9.8	7.7	6.0	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	12.5	12.5	...	...	...	...	...	...	...	...	...	...	...	...	...
8	12.5	12.5	...	...	...	...	...	...	...	...	...	...	...	...	...
9	16.3	16.3	...	...	...	...	...	...	...	...	...	...	...	...	...
10	16.3	16.3	...	...	...	...	...	...	...	...	...	...	...	...	...
11	20.0	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	20.0	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	24.8	24.1	...	...	...	...	...	...	...	...	...	...	...	...	...
14	24.8	24.1	...	...	...	...	...	...	...	...	...	...	...	...	...
15	9.9	9.7	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	16.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	16.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	13.4	13.4	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	12.1	12.0	9.6	6.9	5.0	3.6	2.5	1.7	1.1	0.80	0.50	0.30	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	12.5	12.5	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	16.3	16.3	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	20.0	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	25.0	25.0	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	10.6	10.4	10.1	9.8	7.7	6.0	4.7	3.7	2.9	2.3	1.8	1.4	...	...	...
43	17.7	17.3	...	...	...	...	...	...	...	...	...	...	...	...	...
44	18.8	18.8	...	...	...	...	...	...	...	...	...	...	...	...	...
45	20.0	20.0	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
Ferrous Materials (Cont'd)							
1	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2	$\leq \frac{3}{4}$
2	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B	3
3	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B	>3
4	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B	≤ 3
5	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B	≤ 3
6	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A	>3
7	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A	>3
8	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A	≤ 3
9	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A	≤ 3
10	22Cr-13Ni-5Mn	Bolting	SA-479	XM-19	S20910	Annealed	...
11	22Cr-13Ni-5Mn	Bolting	SA-479	XM-19	S20910	Hot rolled	$3 < t \leq 8$
12	22Cr-13Ni-5Mn	Bolting	SA-479	XM-19	S20910	Hot rolled	$2 < t \leq 3$
13	22Cr-13Ni-5Mn	Bolting	SA-479	XM-19	S20910	Hot rolled	≤ 2
14	23Cr-25Ni-5.5Mo-N	Bolting	SA-193	...	S32053	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
							Ferrous Materials (Cont'd)
1	125	100	NP	1000	800	650	G8
2	95	50	800	NP	NP	NP	...
3	95	50	NP	1000	800	650	...
4	95	60	800	NP	NP	NP	...
5	95	60	NP	1000	800	650	...
6	100	60	800	NP	NP	NP	...
7	100	60	NP	1000	800	650	...
8	100	70	800	NP	NP	NP	...
9	100	70	NP	1000	800	650	...
10	100	55	NP	1150	800	650	T9
11	100	60	NP	1150	800	650	T9
12	115	75	NP	1150	800	650	T9
13	135	105	NP	1150	800	650	T9
14	93	43	NP	662	NP	NP	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
	Ferrous Materials (Cont'd)																
1	25.0	...	25.0	...	25.0	...	25.0	...	25.0	...	25.0	25.0	25.0	25.0	25.0	25.0	25.0
2	12.5	...	11.4	...	10.6	...	10.0	...	9.5	...	9.0	8.8	8.6	8.4	8.3	...	...
3	12.5	...	11.5	...	10.7	...	10.0	...	9.5	...	9.0	8.8	8.7	8.5	8.3	8.2	8.0
4	15.0	...	13.7	...	12.7	...	12.0	...	11.5	...	10.9	10.6	10.4	10.1	9.9	...	...
5	15.0	...	13.8	...	12.8	...	12.1	...	11.5	...	10.9	10.6	10.4	10.2	10.0	9.8	9.6
6	15.0	...	13.7	...	12.7	...	12.0	...	11.5	...	10.9	10.6	10.4	10.1	9.9	...	...
7	15.0	...	13.8	...	12.8	...	12.1	...	11.5	...	10.9	10.7	10.4	10.2	10.0	9.8	9.6
8	17.5	...	16.0	...	14.8	...	14.0	...	13.4	...	12.7	12.4	12.1	11.8	11.6	...	...
9	17.5	...	16.1	...	14.9	...	14.1	...	13.4	...	12.7	12.4	12.2	11.9	11.6	11.4	11.2
10	25.0	...	24.9	...	23.6	...	22.7	...	22.3	...	21.9	21.8	21.6	21.4	21.2	20.9	20.6
11	25.0	...	24.9	...	23.6	...	22.7	...	22.3	...	21.9	21.8	21.6	21.4	21.2	20.9	20.6
12	25.0	...	24.9	...	23.6	...	22.7	...	22.3	...	21.9	21.8	21.6	21.4	21.2	20.9	20.6
13	26.2	...	26.2	...	26.2	...	26.2	...	26.2	...	26.2	26.2	26.2	26.2	26.2	26.2	26.2
14	26.5	...	24.2	...	21.9	...	20.8	...	19.3	...	18.5	18.2	17.9	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)														
1	24.8	24.1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	7.9	7.7	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	9.4	9.2	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	9.4	9.2	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	11.0	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...
10	20.3	19.9	19.0	13.0	8.3	...	...	...	...	...	...	...	...	...	...
11	20.3	19.9	19.0	13.0	8.3	...	...	...	...	...	...	...	...	...	...
12	20.3	19.9	19.0	13.0	8.3	...	...	...	...	...	...	...	...	...	...
13	26.2	26.2	19.0	13.0	8.3	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
Nonferrous Materials							
1	...	Bolting	SB-211	2014	A92014	T6	0.125–8.000
2	...	Bolting	SB-211	2014	A92014	T651	0.125–8.000
3	...	Bolting	SB-211	2024	A92024	T4	0.125–0.499
4	...	Bolting	SB-211	2024	A92024	T4	0.500–4.500
5	...	Bolting	SB-211	2024	A92024	T4	4.501–6.500
6	...	Bolting	SB-211	2024	A92024	T4	6.501–8.000
7	...	Bolting	SB-211	6061	A96061	T6	0.125–8.000
8	...	Bolting	SB-211	6061	A96061	T651	0.125–8.000
(23) 9	...	Bar, rod	SB-187	...	C10200	O60	All
(23) 10	...	Bar, rod	SB-187	...	C11000	O60	All
11	...	Rod	SB-150	...	C61400	HR50	$2 < t \leq 3$
12	...	Rod	SB-150	...	C61400	HR50	$1 < t \leq 2$
13	...	Rod	SB-150	...	C61400	HR50	$\frac{1}{2} < t \leq 1$
14	...	Rod	SB-150	...	C61400	HR50	$\leq \frac{1}{2}$
15	...	Round rod	SB-150	...	C62300	HR50	> 3
16	...	Bar, rod	SB-150	...	C62300	M20	> 3
17	...	Bar, rod	SB-150	...	C62300	M30	> 3
18	...	Bar, rod	SB-150	...	C62300	O20, O25, O30	> 3
19	...	Hex/oct rod & bar	SB-150	...	C62300	M20	> 2
20	...	Hex/oct rod & bar	SB-150	...	C62300	HR50	$1 < t \leq 2$
21	...	Hex/oct rod & bar	SB-150	...	C62300	HR50	≤ 1
22	...	Round rod	SB-150	...	C62300	HR50	$2 < t \leq 3$
23	...	Round rod	SB-150	...	C62300	HR50	$1 < t \leq 2$
24	...	Round rod	SB-150	...	C62300	HR50	$\frac{1}{2} < t \leq 1$
25	...	Round rod	SB-150	...	C62300	HR50	$\leq \frac{1}{2}$
26	...	Bar, rod	SB-150	...	C63000	M20, M30	> 4
27	...	Bar, rod	SB-150	...	C63000	O20, O25, O30	> 4
28	...	Bar, rod	SB-150	...	C63000	HR50	> 4
(23) 29	...	Bar, rod	SB-150	...	C63000	HR50	$2 < t \leq 4$
30	...	Bar, rod	SB-150	...	C63000	M20, M30	$2 < t \leq 4$
31	...	Bar, rod	SB-150	...	C63000	O20, O25, O30	$2 < t \leq 4$
(23) 32	...	Bar, rod	SB-150	...	C63000	HR50	$1 < t \leq 2$
33	...	Bar, rod	SB-150	...	C63000	HR50	$\frac{1}{2} < t \leq 1$
(23) 34	...	Bar, rod	SB-150	...	C64200	M10, M20, M30	> 4
(23) 35	...	Bar, rod	SB-150	...	C64200	M10, M20, M30	$3 < t \leq 4$
(23) 36	...	Bar, rod	SB-150	...	C64200	HR50	$2 < t \leq 3$
(23) 37	...	Bar, rod	SB-150	...	C64200	HR50	$1 < t \leq 2$
(23) 38	...	Bar, rod	SB-150	...	C64200	HR50	$\frac{1}{2} < t \leq 1$
(23) 39	...	Bar, rod	SB-150	...	C64200	HR50	$\leq \frac{1}{2}$
40	...	Rod	SB-98	...	C65100	O60	All
41	...	Rod	SB-98	...	C65100	H06	$1 < t \leq 1\frac{1}{2}$
42	...	Rod	SB-98	...	C65100	H06	$\frac{1}{2} < t \leq 1$
43	...	Rod	SB-98	...	C65100	H06	$\leq \frac{1}{2}$
44	...	Rod	SB-98	...	C65500	O60	All
45	...	Rod	SB-98	...	C65500	H01	All

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
Nonferrous Materials							
1	65	55	400 (Cl. 3 only)	400	400	400	T1, W4
2	65	55	NP	400	400	400	G10, T1, W4
3	62	45	400 (Cl. 3 only)	400	400	400	T1, W4
4	62	42	400 (Cl. 3 only)	400	400	400	T1, W4
5	62	40	400 (Cl. 3 only)	400	400	400	T2, W4
6	58	38	400 (Cl. 3 only)	400	400	400	T2, W4
7	42	35	400 (Cl. 3 only)	400	400	400	T2, W4
8	42	35	NP	400	400	400	G10, T2, W4
9	28	8	NP	400	400	400	T2
10	28	8	NP	400	400	400	T2
11	70	30	500 (Cl. 3 only)	500	500	500	...
12	70	32	500 (Cl. 3 only)	500	500	500	...
13	75	35	500 (Cl. 3 only)	500	500	500	...
14	80	40	500 (Cl. 3 only)	500	500	500	...
15	75	30	400 (Cl. 3 only)	600	400	600	T3, W1
16	75	30	400 (Cl. 3 only)	600	400	600	T3, W1
17	75	30	400 (Cl. 3 only)	600	400	600	T3, W1
18	75	30	400 (Cl. 3 only)	600	400	600	T3, W1
19	75	30	400 (Cl. 3 only)	600	400	600	T3, W1
20	78	32	400 (Cl. 3 only)	600	400	600	T3, W1
21	80	35	400 (Cl. 3 only)	600	400	600	T3, W1
22	76	37	400 (Cl. 3 only)	600	400	600	T3, W1
23	84	40	400 (Cl. 3 only)	600	400	600	T3, W1
24	88	44	400 (Cl. 3 only)	600	400	600	T3, W1
25	90	50	400 (Cl. 3 only)	600	400	600	T3, W1
26	80	40	700 (Cl. 3 only)	700	500	650	T4, W4
27	80	40	700 (Cl. 3 only)	700	500	650	T4, W4
28	80	40	700 (Cl. 3 only)	700	500	650	T4, W4
29	85	42.5	700 (Cl. 3 only)	700	500	650	T4, W4
30	85	42.5	700 (Cl. 3 only)	700	500	650	T4, W4
31	85	42.5	700 (Cl. 3 only)	700	500	650	T4, W4
32	90	45	700 (Cl. 3 only)	700	500	650	T4, W4
33	100	50	700 (Cl. 3 only)	700	500	650	T4, W4
34	70	25	350 (Cl. 3 only)	600	350	600	T13, W1
35	70	30	350 (Cl. 3 only)	600	350	600	T13, W4
36	75	35	350 (Cl. 3 only)	600	350	600	T13, W1
37	80	42	350 (Cl. 3 only)	600	350	600	T13, W1
38	85	45	350 (Cl. 3 only)	600	350	600	T13, W1
39	90	45	350 (Cl. 3 only)	600	350	600	T13, W1
40	40	12	350 (Cl. 3 only)	350	350	350	G2
41	75	40	350 (Cl. 3 only)	350	350	350	G2, W2
42	75	45	350 (Cl. 3 only)	350	350	350	G2, W2
43	85	55	350 (Cl. 3 only)	350	350	350	G2, W2
44	52	15	350 (Cl. 3 only)	350	350	350	G2
45	55	24	350 (Cl. 3 only)	NP	350	NP	G2, W2

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Nonferrous Materials																	
1	13.0	13.0	13.0	13.0	11.4	6.8	3.9	...	...	...	...	...	...	...	...	...	...
2	13.0	13.0	13.0	13.0	11.4	6.8	3.9	...	...	...	...	...	...	...	...	...	...
3	11.3	11.3	11.3	11.3	10.4	6.5	4.5	...	...	...	...	...	...	...	...	...	...
4	10.5	10.5	10.5	10.5	10.4	6.5	4.5	...	...	...	...	...	...	...	...	...	...
5	10.0	10.0	10.0	10.0	10.0	6.5	4.5	...	...	...	...	...	...	...	...	...	...
6	9.5	9.5	9.5	9.5	9.5	6.1	4.2	...	...	...	...	...	...	...	...	...	...
7	8.4	8.4	8.4	8.4	8.4	6.3	4.4	...	...	...	...	...	...	...	...	...	...
8	8.4	8.4	8.4	8.4	8.4	6.3	4.4	...	...	...	...	...	...	...	...	...	...
9	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	...	...	...
10	5.3	4.7	4.7	4.7	4.7	4.4	3.0	...	...	...	...	...	...	...	...	...	...
11	17.5	17.5	17.5	17.5	17.5	17.5	17.2	16.6	16.1	...	...	...	...	...	...	...	...
12	17.5	17.5	17.5	17.5	17.5	17.5	17.2	16.6	16.1	...	...	...	...	...	...	...	...
13	17.5	17.5	17.5	17.5	17.5	17.5	17.2	16.6	16.1	...	...	...	...	...	...	...	...
14	17.5	17.5	17.5	17.5	17.5	17.5	17.2	16.6	16.1	...	...	...	...	...	...	...	...
15	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
16	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
17	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
18	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
19	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
20	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
21	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
22	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
23	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
24	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
25	18.8	18.8	18.8	18.8	18.7	18.1	17.7	16.0	12.5	10.6	9.9	...	...	...	...	...	...
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.4	12.0	8.5	6.0	...	...	...	...
27	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.4	12.0	8.5	6.0	...	...	...	...
28	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.4	12.0	8.5	6.0	...	...	...	...
29	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.4	12.0	8.5	6.0	...	...	...	...
30	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	16.4	12.0	8.5	6.0	...	...	...	...
31	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	16.4	12.0	8.5	6.0	...	...	...	...
32	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.4	12.0	8.5	6.0	...	...	...	...
33	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.4	12.0	8.5	6.0	...	...	...	...
34	16.7	16.7	15.6	15.4	15.4	15.4	11.0	7.5	5.2	2.5	1.7	...	...	...	...	...	...
35	17.5	17.5	17.5	17.5	17.5	17.5	11.0	7.5	5.2	2.5	1.7	...	...	...	...	...	...
36	16.7	16.7	15.6	15.4	15.4	15.4	11.0	7.5	5.2	2.5	1.7	...	...	...	...	...	...
37	16.7	16.7	15.6	15.4	15.4	15.4	11.0	7.5	5.2	2.5	1.7	...	...	...	...	...	...
38	16.7	16.7	15.6	15.4	15.4	15.4	11.0	7.5	5.2	2.5	1.7	...	...	...	...	...	...
39	16.7	16.7	15.6	15.4	15.4	15.4	11.0	7.5	5.2	2.5	1.7	...	...	...	...	...	...
40	8.0	7.9	7.9	7.8	7.8	7.7	...	...	...	...	...	...	...	...	...	...	...
41	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
42	11.3	11.3	11.3	11.3	11.3	11.3	...	...	...	...	...	...	...	...	...	...	...
43	13.8	13.8	13.8	13.8	13.8	13.8	...	...	...	...	...	...	...	...	...	...	...
44	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...
45	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Nonferrous Materials														
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
Nonferrous Materials (Cont'd)							
1	...	Rod	SB-98	...	C65500	H02	≤2
2	...	Rod	SB-98	...	C66100	O60	All
3	...	Rod	SB-98	...	C66100	H01	All
4	...	Rod	SB-98	...	C66100	H02	≤2
5	99Ni	Bolting	SB-160	...	N02200	Annealed	...
6	99Ni	Bolting	SB-160	...	N02200	Hot fin./ann.	...
7	99Ni	Bolting	SB-160	...	N02200	Cold drawn	...
8	99Ni-Low C	Bolting	SB-160	...	N02201	Hot fin./ann.	...
(23) 9	67Ni-30Cu	Bolting	SB-164	...	N04400	HW or CW ann.	All
(23) 10	67Ni-30Cu	Bolting	SB-164	...	N04400	Hot worked	12 < t ≤ 14
(23) 11	67Ni-30Cu	Bolting	SB-164	...	N04400	Hot worked	≤12
(23) 12	67Ni-30Cu	Bolting	SB-164	...	N04400	CD-str. rel.	≤12
(23) 13	67Ni-30Cu	Bolting	SB-164	...	N04400	Cold worked	≤12
(23) 14	67Ni-30Cu	Bolting	SB-164	...	N04400	CD-str. rel.	$\frac{1}{2} < t \leq 3\frac{1}{2}$
15	67Ni-30Cu-S	Bolting	SB-164	...	N04405	Annealed	...
16	67Ni-30Cu-S	Bolting	SB-164	...	N04405	Annealed	...
17	67Ni-30Cu-S	Bolting	SB-164	...	N04405	Hot worked	...
18	67Ni-30Cu-S	Bolting	SB-164	...	N04405	Hot worked	...
19	67Ni-30Cu-S	Bolting	SB-164	...	N04405	Cold worked	...
20	67Ni-28Cu-3Al	Bolting	SF-468	...	N05500	Ann./aged	1.000-1.500
21	67Ni-28Cu-3Al	Bolting	SF-468	...	N05500	Ann./aged	0.250-0.875
22	47Ni-22Cr-9Mo-18Fe	Bolting	SB-572	...	N06002	Annealed	...
23	47Ni-22Cr-19Fe-6Mo	Bolting	SB-581	...	N06007	Solution ann.	$>\frac{3}{4}$
24	47Ni-22Cr-19Fe-6Mo	Bolting	SB-581	...	N06007	Solution ann.	$<\frac{3}{4}$
25	55Ni-21Cr-13.5Mo	Bolting	SB-574	...	N06022	Solution ann.	...
26	40Ni-29Cr-15Fe-5Mo	Bolting	SB-581	...	N06030	Solution ann.	...
27	61Ni-16Mo-16Cr	Bolting	SB-574	...	N06455	Solution ann.	...
28	72Ni-15Cr-8Fe	Bolting	SB-166	...	N06600	Annealed	...
29	72Ni-15Cr-8Fe	Bolting	SB-166	...	N06600	Hot fin.	...
30	72Ni-15Cr-8Fe	Bolting	SB-166	...	N06600	Cold drawn	...
31	72Ni-15Cr-8Fe	Bolting	SB-166	...	N06600	Hot fin.	...
32	72Ni-15Cr-8Fe	Bolting	SB-166	...	N06600	Hot fin.	...
33	60Ni-22Cr-9Mo-3.5Cb	Bolting	SB-446	1	N06625	Annealed	...
34	49Ni-25Cr-18Fe-6Mo	Bolting	SB-581	...	N06975	Solution ann.	...
35	53Ni-19Cr-19Fe-Cb-Mo	Bolting	SB-637	...	N07718	Ann./aged	≤6
36	70Ni-16Cr-7Fe-Ti-Al	Bolting	SB-637	2	N07750	Ann./aged	...
37	26Ni-43Fe-22Cr-5Mo	Bolting	SB-621	...	N08320	Solution ann.	...
38	46Fe-24Ni-21Cr-6Mo-N	Bolting	SB-691	...	N08367	Solution ann.	...
39	33Ni-42Fe-21Cr	Bolting	SB-408	...	N08800	Annealed	...
40	33Ni-42Fe-21Cr	Bolting	SB-408	...	N08810	Annealed	...
41	42Ni-21.5Cr-3Mo-2.3Cu	Bolting	SB-425	...	N08825	Annealed	...
42	62Ni-28Mo-5Fe	Bolting	SB-335	...	N10001	Annealed	$1\frac{1}{2} < t \leq 3\frac{1}{2}$
(23) 43	62Ni-28Mo-5Fe	Bolting	SB-335	...	N10001	Annealed	≤1 $\frac{1}{2}$
44	70Ni-16Mo-7Cr-5Fe	Bolting	SB-573	...	N10003	Annealed	...
45	54Ni-16Mo-15Cr	Bolting	SB-574	...	N10276	Solution ann.	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
Nonferrous Materials (Cont'd)							
1	70	38	350 (Cl. 3 only)	NP	350	NP	G2, W2
2	52	15	350 (Cl. 3 only)	350	350	350	G2
3	55	24	350 (Cl. 3 only)	NP	350	NP	G2, W2
4	70	38	350 (Cl. 3 only)	NP	350	NP	G2, W2
5	55	15	600 (Cl. 3 only)	600	600	600	...
6	60	15	600 (Cl. 3 only)	600	600	600	...
7	65	40	600 (Cl. 3 only)	600	600	600	...
8	50	10	600 (Cl. 3 only)	1200	800	650	T5
9	70	25	800	900	800	650	T5
10	75	30	800	900	800	650	T5
11	80	40	800	900	800	650	T5
12	84	50	500	500	500	500	G3
13	85	55	500	500	500	500	G3
14	87	60	NP	500	500	500	G3
15	70	25	800	NP	NP	NP	...
16	70	25	NP	900	800	650	T5
17	75	35	800	NP	NP	NP	...
18	75	35	NP	900	800	650	T5
19	85	50	500	500	500	500	G3
20	130	85	NP	500	NP	NP	...
21	130	90	NP	500	NP	NP	...
22	95	35	NP	1650	800	650	T11
23	85	30	NP	1000	800	650	...
24	90	35	NP	1000	800	650	...
25	100	45	NP	800	800	650	...
26	85	35	NP	800	800	650	...
27	100	40	NP	800	800	650	...
28	80	35	800	1200	800	650	T6
29	85	35	800	1200	800	650	T7
30	90	40	NP	500	500	500	G3, H1
31	90	40	800	NP	NP	NP	...
32	90	40	NP	1200	800	650	T7
33	120	60	NP	1200	800	650	G1, T11
34	85	32	NP	800	800	650	...
35	185	150	800	1150	800	650	W4, W5
36	170	115	800	800	800	650	...
37	75	28	NP	800	800	650	...
38	95	45	800	800	NP	NP	...
39	75	30	NP	1500	800	650	T10
40	65	25	NP	1650	800	650	T11
41	85	35	NP	1000	800	650	...
42	100	46	800	800	800	650	...
43	115	46	800	800	800	650	...
44	100	40	NP	1300	800	650	T10
45	100	41	NP	1250	800	650	T10

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Nonferrous Materials (Cont'd)																	
1	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...
2	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...
3	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...
4	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...	...	...	...	...	...	...	...	...
5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...
6	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.8	9.5	8.9	8.3	...	...	...	...	...	...
7	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...
8	6.7	6.6	6.4	6.3	6.3	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.0	5.9	5.8	4.8
9	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.1	12.9	12.7	11.0	8.0
10	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.1	12.9	12.7	11.0	8.0
11	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.0	12.9	12.7	8.5	4.0
12	16.7	...	14.6	...	13.6	...	13.2	...	13.1	...	...	...	...	...	...	...	...
13	16.7	...	14.6	...	13.8	...	13.8	...	13.8	...	...	...	...	...	...	...	...
14	16.7	...	15.0	...	15.0	...	15.0	...	15.0	...	...	...	...	...	...	...	...
15	16.6	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.1	12.9	12.7	...	...
16	16.6	...	14.6	...	13.6	...	13.2	...	13.1	...	13.1	13.1	13.1	13.0	12.7	11.0	8.0
17	18.7	...	18.7	...	18.7	...	18.7	...	18.7	...	18.7	18.4	18.0	16.3	14.5	...	...
18	18.7	...	18.7	...	18.7	...	18.7	...	18.7	...	18.7	18.7	18.0	17.2	14.5	8.5	4.0
19	12.5	...	12.5	...	12.5	...	12.5	...	12.5	...	...	...	...	...	...	...	...
20	21.3	...	21.3	...	21.3	...	21.3	...	21.3	...	...	...	...	...	...	...	...
21	22.5	...	22.5	...	22.5	...	22.5	...	22.5	...	...	...	...	...	...	...	...
22	23.3	...	20.9	...	19.2	...	17.8	...	16.5	...	15.6	15.3	15.0	14.9	14.7	14.6	14.5
23	20.0	...	19.9	...	16.6	...	15.6	...	15.0	...	14.4	14.2	14.0	13.9	13.8	13.7	13.6
24	22.5	...	20.9	...	19.5	...	18.2	...	17.4	...	16.8	16.6	16.4	16.3	16.1	16.0	16.0
25	25.0	...	25.0	...	24.5	...	22.7	...	21.2	...	20.1	19.6	19.2	18.9	18.6	...	...
26	21.3	...	20.0	...	18.3	...	17.2	...	16.4	...	15.8	15.5	15.2	14.9	14.6	...	...
27	25.0	...	24.6	...	23.0	...	21.7	...	20.9	...	20.1	19.8	19.6	19.4	19.1	...	...
28	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	20.0	19.8	19.6	19.4	19.1	18.7	16.0
29	21.2	...	21.2	...	21.2	...	21.2	...	21.2	...	21.2	21.2	21.1	21.0	20.4	20.2	19.5
30	20.0	...	20.0	...	20.0	...	20.0	...	20.0	...	...	...	...	...	...	...	...
31	10.0	...	9.5	...	9.2	...	9.1	...	9.1	...	9.1	9.0	8.9	8.9	8.8	...	...
32	21.2	...	21.2	...	21.2	...	21.2	...	21.2	...	21.2	21.2	21.1	21.0	20.4	20.2	19.5
33	30.0	...	30.0	...	30.0	...	28.2	...	27.0	...	26.4	26.2	26.0	26.0	24.6	24.3	24.0
34	21.3	...	19.6	...	18.4	...	17.6	...	16.5	...	15.6	15.3	15.1	14.9	14.7	...	...
35	37.0	...	36.0	...	35.2	...	34.6	...	34.2	...	33.8	33.7	33.6	33.5	33.3	33.1	32.9
36	28.7	...	28.7	...	28.7	...	28.7	...	28.7	...	28.7	28.7	28.7	28.7	28.7	...	...
37	18.7	...	17.3	...	16.4	...	15.3	...	14.6	...	13.7	13.5	13.2	12.9	12.8	...	...
38	23.8	...	23.8	...	22.4	...	21.5	...	20.5	...	19.4	19.0	18.6	18.3	18.0	...	...
39	18.7	...	18.7	...	17.9	...	17.2	...	16.7	...	16.3	16.1	15.9	15.7	15.5	15.3	15.1
40	16.2	...	15.4	...	14.5	...	13.5	...	12.9	...	12.2	11.9	11.7	11.4	11.1	10.9	10.7
41	21.2	...	21.2	...	20.4	...	19.2	...	18.3	...	17.8	17.6	17.3	17.2	17.1	16.9	16.8
42	25.0	...	25.0	...	25.0	...	24.7	...	24.3	...	23.7	23.4	23.0	22.8	22.5	...	...
43	28.8	...	27.8	...	26.3	...	25.1	...	24.3	...	23.5	23.3	23.0	22.8	22.6	...	...
44	25.0	...	24.0	...	23.0	...	21.0	...	20.0	...	20.0	19.5	19.0	18.5	18.0	17.7	17.5
45	25.0	...	25.0	...	23.0	...	21.2	...	20.0	...	18.8	18.3	17.8	17.4	17.1	16.8	16.6

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3,* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Nonferrous Materials (Cont'd)														
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	3.7	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	14.4	14.3	14.2	14.2	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.3	1.7	1.2
23	13.6	13.5	...	...	...	...	...	...	...	...	...	...	...	...	...
24	15.9	15.8	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	10.6	7.0	4.5	3.0	2.2	2.2	...	...	...	...	...	...	...	...	...
29	19.3	14.5	10.3	7.2	5.8	5.5	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	19.3	14.5	10.3	7.2	5.8	5.5	...	...	...	...	...	...	...	...	...
33	23.9	23.7	23.6	23.4	21.0	13.2	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	32.6	32.3	32.0	30.7	29.5	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	14.9	14.7	14.5	13.0	9.8	6.6	4.2	2.2	1.6	1.1	1.0	0.80	...	...	...
40	10.5	10.3	10.1	10.0	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.5	1.2	0.98
41	16.7	16.6	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
44	17.3	17.0	15.5	12.4	9.3	6.6	4.8	3.5	...	...	...	...	...	...	...
45	16.5	16.5	16.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Condition/ Temper	Size/ Thickness, in.
	Nonferrous Materials (Cont'd)						
1	65Ni-28Mo-2Fe	Bolting	SB-335	...	N10665	Solution ann.	...
2	21Ni-30Fe-22Cr-18Co-3Mo-3W	Bolting	SB-572	...	R30556	Annealed	...

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)				Notes
			III	VIII-1	VIII-2	XII	
1	110	51	NP	800	800	650	Nonferrous Materials (Cont'd)
2	100	45	NP	1650	800	650	... T12

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line		Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																
No.		100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
	Nonferrous Materials (Cont'd)																	
1		27.5	...	27.5	...	27.5	...	27.5	...	27.5	...	27.2	26.8	26.6	26.1	25.6	...	...
2		25.0	...	25.0	...	23.1	...	21.3	...	20.1	...	19.3	19.0	18.7	18.5	18.2	18.0	17.8

Table 3 (Cont'd)
Section III, Division 1, Classes 2 and 3;* Section VIII, Divisions 1 and 2;† and Section XII
Maximum Allowable Stress Values, S, for Bolting Materials
 (*See Maximum Temperature Limits for Restrictions on Class)
 (†Use with Part 4.16 of Section VIII, Division 2)

Line No.	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	17.6	17.4	17.2	17.1	16.9	13.6	10.9	8.8	7.0	5.6	4.5	3.6	2.8	2.2	1.8

Nonferrous Materials (Cont'd)

NOTES TO TABLE 3**GENERAL NOTES**

- (a) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (b) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (c) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.
- (d) These stress values are established from a consideration of strength only and will be satisfactory for average service. For bolted joints where freedom from leakage over a long period of time without retightening is required, lower stress values may be necessary as determined from the relative flexibility of the flange and bolts, and corresponding relaxation properties.
- (e) Stress values for 100°F are applicable for colder temperatures when toughness requirements of Section III or Section VIII are met.
- (f) For bolting with a reported hardness exceeding 350 HB, user is cautioned that under certain conditions of temperature and environment or fatigue conditions, stress corrosion cracking of this high hardness bolting shall be considered.
- (g) The following abbreviations are used: Ann., Annealed; ann., annealed; CD, Cold drawn; fin., finished; rel., relieved; str., stress; and wld., welded.
- (h) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-193/SA-193M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-193 Grade B6 shall be used when SA-193M Grade B6 is used in construction.
- (i) An alternative typeface is used for stress values obtained from time-dependent properties (see Notes T1 through T12).

NOTES - GENERAL REQUIREMENTS

- G1 Alloy N06625 in the annealed condition is subject to severe loss of impact strength at room temperatures after exposure in the range of 1000°F to 1400°F.
- G2 Copper-silicon alloys are not always suitable when exposed to certain media and high temperatures, particularly steam above 212°F. The owner, the owner's designated agent, or the user should ensure him/herself that the alloy selected is satisfactory for the service for which it is to be used.
- G3 The maximum operating temperature is arbitrarily set at 500°F because harder temper adversely affects design stress in the creep rupture temperature range.
- G4 This material has reduced toughness at room temperature after exposure for about 5000 hr at 600°F and after shorter exposure above 650°F.
- G5 At temperatures above 1000°F, these stress values apply only when the carbon is 0.04% or higher on heat analysis.
- G6 For temperatures above 1000°F, these stress values may be used only if the material is heat treated by heating it to a minimum temperature of 1900°F.
- G7 The user is cautioned that under certain conditions of temperature and environment or fatigue conditions, stress corrosion of this material shall be considered.
- G8 For all design temperatures, the maximum hardness shall be Rockwell C35 immediately under thread roots. The hardness shall be taken on a flat area at least $\frac{1}{8}$ in. across, prepared by removing threads; no more material than necessary shall be removed to prepare the flat area. Hardness determinations shall be made at the same frequency as tensile tests.
- G9 For Section VIII, Division 1 applications, use of external pressure charts for material in the form of bar stock is permitted for stiffening rings only.
- G10 For stress relieved tempers, stress values for T3 temper can be used for T351, T3510, and T3511; stress values for T4 temper can be used for T451, T4510, and T4511; and stress values for T6 temper can be used for T651, T6510, and T6511.
- G11 The shipping lot testing method of SA-574, 11.3, is prohibited.
- G12 Since these bolts could be used in flanged joints, the maximum permitted temperature and maximum allowable stress are limited to reduce the potential for bolt relaxation and associated flange leakage.

NOTES - HEAT TREATMENT REQUIREMENTS

- H1 Design stresses for the cold drawn temper based on hot rolled properties until required data on cold drawn is submitted.

NOTES - TIME-DEPENDENT PROPERTIES [See General Note (i)]

- T1 Allowable stresses for temperatures of 300°F and above are values obtained from time-dependent properties.
- T2 Allowable stresses for temperatures of 350°F and above are values obtained from time-dependent properties.
- T3 Allowable stresses for temperatures of 450°F and above are values obtained from time-dependent properties.
- T4 Allowable stresses for temperatures of 550°F and above are values obtained from time-dependent properties.
- T5 Allowable stresses for temperatures of 850°F and above are values obtained from time-dependent properties.
- T6 Allowable stresses for temperatures of 900°F and above are values obtained from time-dependent properties.
- T7 Allowable stresses for temperatures of 950°F and above are values obtained from time-dependent properties.
- T8 Allowable stresses for temperatures of 1000°F and above are values obtained from time-dependent properties.
- T9 Allowable stresses for temperatures of 1050°F and above are values obtained from time-dependent properties.
- T10 Allowable stresses for temperatures of 1100°F and above are values obtained from time-dependent properties.

NOTES TO TABLE 3 (CONT'D)

NOTES – TIME-DEPENDENT PROPERTIES [See General Note (i)] (CONT'D)

T11 Allowable stresses for temperatures of 1150°F and above are values obtained from time-dependent properties.

T12 Allowable stresses for temperatures of 1200°F and above are values obtained from time-dependent properties.

(23) T13 Allowable stresses for temperatures of 400°F and above are values obtained from time-dependent properties.

NOTES – WELDING REQUIREMENTS

W1 Welding, brazing, and thermal cutting are not permitted.

W2 If welded, the allowable stress values for the annealed condition shall be used.

W3 This material may be welded by the resistance technique.

W4 The stress values given for this material are not applicable when either welding or thermal cutting is employed.

W5 Except for nonstructural tack welds used as a locking device, welding is prohibited for Section VIII, Division 1 use.

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Table 4
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Nominal Composition	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/Condition/ Temper	Size/ Thickness, in.
Ferrous Materials						
1	1Cr-1Mn- $\frac{1}{4}$ Mo	SA-540	B22	K41420	5	$2 < t \leq 4$
2	1Cr-1Mn- $\frac{1}{4}$ Mo	SA-540	B22	K41420	5	≤ 2
3	1Cr-1Mn- $\frac{1}{4}$ Mo	SA-540	B22	K41420	4	≤ 4
4	1Cr-1Mn- $\frac{1}{4}$ Mo	SA-540	B22	K41420	3	≤ 4
5	1Cr-1Mn- $\frac{1}{4}$ Mo	SA-540	B22	K41420	2	≤ 3
6	1Cr-1Mn- $\frac{1}{4}$ Mo	SA-540	B22	K41420	1	$\leq 1\frac{1}{2}$
7	1Cr- $\frac{1}{5}$ Mo	SA-193	B7	G41400	...	$4 < t \leq 7$
8	1Cr- $\frac{1}{5}$ Mo	SA-193	B7M	G41400	...	$\leq 2\frac{1}{2}$
9	1Cr- $\frac{1}{5}$ Mo	SA-193	B7	G41400	...	$2\frac{1}{2} < t \leq 4$
10	1Cr- $\frac{1}{5}$ Mo	SA-193	B7	G41400	...	$\leq 2\frac{1}{2}$
11	1Cr- $\frac{1}{2}$ Mo-V	SA-193	B16	K14072	...	$4 < t \leq 8$
12	1Cr- $\frac{1}{2}$ Mo-V	SA-193	B16	K14072	...	$4 < t \leq 8$
13	1Cr- $\frac{1}{2}$ Mo-V	SA-193	B16	K14072	...	$2\frac{1}{2} < t \leq 4$
14	1Cr- $\frac{1}{2}$ Mo-V	SA-193	B16	K14072	...	$2\frac{1}{2} < t \leq 4$
15	1Cr- $\frac{1}{2}$ Mo-V	SA-540	B21	K14073	5	$2 < t \leq 8$
16	1Cr- $\frac{1}{2}$ Mo-V	SA-540	B21	K14073	5	≤ 2
17	1Cr- $\frac{1}{2}$ Mo-V	SA-193	B16	K14072	...	$\leq 2\frac{1}{2}$
18	1Cr- $\frac{1}{2}$ Mo-V	SA-193	B16	K14072	...	$\leq 2\frac{1}{2}$
19	1Cr- $\frac{1}{2}$ Mo-V	SA-540	B21	K14073	4	≤ 6
20	1Cr- $\frac{1}{2}$ Mo-V	SA-540	B21	K14073	3	≤ 6
21	1Cr- $\frac{1}{2}$ Mo-V	SA-540	B21	K14073	2	≤ 4
22	1Cr- $\frac{1}{2}$ Mo-V	SA-540	B21	K14073	1	≤ 4
23	12Cr-1Mo-V-W	SA-437	B4C	K91352	...	...
24	12Cr-1Mo-V-W	SA-437	B4B	K91352	...	...
25	13Cr	SA-193	B6	S41000	...	≤ 4
26	17Cr-4Ni-4Cu	SA-564	630	S17400	H1100	≤ 8
27	17Cr-4Ni-4Cu	SA-705	630	S17400	H1100	≤ 8
28	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-320	L43	G43400	...	≤ 4
29	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	5	$6 < t \leq 9\frac{1}{2}$
30	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	5	$6 < t \leq 9\frac{1}{2}$
31	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	5	≤ 6
32	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	4	$\leq 9\frac{1}{2}$
33	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	3	$\leq 9\frac{1}{2}$
34	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	2	$\leq 9\frac{1}{2}$
35	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	SA-540	B23	H43400	1	≤ 8
36	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	5	$6 < t \leq 9\frac{1}{2}$
37	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	5	$6 < t \leq 9\frac{1}{2}$
38	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	5	≤ 6
39	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	4	$\leq 9\frac{1}{2}$
40	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	3	$\leq 9\frac{1}{2}$
41	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	2	$\leq 9\frac{1}{2}$
42	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	SA-540	B24	K24064	1	≤ 8
43	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo-V	SA-540	B24V	K24070	3	≤ 11
44	25Ni-15Cr-2Ti	SA-453	660	S66286	A	...
45	25Ni-15Cr-2Ti	SA-453	660	S66286	B	...

Table 4
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)		Notes
			III	VIII-2	
			Ferrous Materials		
1	115	100	700	700	G4
2	120	105	700	700	G4
3	135	120	700	700	G4
4	145	130	700	700	G3
5	155	140	700	700	G3
6	165	150	600	600	G1
7	100	75	800	800	G4
8	100	80	NP	800	G4
9	115	95	800	800	G4
10	125	105	800	800	G4
11	100	85	800	NP	...
12	100	85	NP	800	...
13	110	95	800	NP	...
14	110	95	NP	800	...
15	115	100	700	700	G4
16	120	105	700	700	G4
17	125	105	800	NP	...
18	125	105	NP	800	...
19	135	120	700	700	G4
20	145	130	700	700	G3
21	155	140	700	700	G3
22	165	150	700	700	G1
23	115	85	700	700	...
24	145	105	700	700	...
25	110	85	700	700	...
26	140	115	650	650	G2
27	140	115	650	650	G2
28	125	105	800	800	G4
29	115	100	700	NP	G4
30	115	100	NP	700	G4
31	120	105	700	700	G4
32	135	120	700	700	G4
33	145	130	700	700	G3
34	155	140	700	700	G3
35	165	150	600	600	G1
36	115	100	700	NP	G4
37	115	100	NP	700	G4
38	120	105	700	700	G4
39	135	120	700	700	G4
40	145	130	700	700	G3
41	155	140	700	700	G3
42	165	150	600	600	G1
43	145	130	700	700	G3
44	130	85	800	800	...
45	130	85	800	800	...

Table 4
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
	100	200	300	400	500	600	650	700	750	800
Ferrous Materials										
1	33.3	31.8	30.9	29.8	28.9	27.6	...	25.9	...	...
2	35.0	33.4	32.4	31.3	30.3	29.0	...	27.2	...	...
3	40.0	38.2	36.9	35.9	34.7	33.1	...	31.1	...	...
4	43.3	41.4	40.2	38.8	37.6	35.9	...	33.7	...	...
5	46.7	44.6	43.1	41.8	40.5	38.7	...	36.3	...	...
6	50.0	47.8	46.2	44.8	43.4	41.4	...	...	...	...
7	25.0	23.3	22.4	21.8	21.1	20.3	19.8	19.2	18.5	17.6
8	26.7	24.9	23.9	23.2	22.5	21.7	21.1	20.5	19.7	18.8
9	31.7	29.5	28.4	27.6	26.7	25.7	25.0	24.3	23.4	22.3
10	35.0	32.6	31.4	30.5	29.5	28.4	27.7	26.9	25.9	24.6
11	28.3	27.4	26.6	25.9	25.2	24.5	...	23.7	...	22.6
12	28.3	27.5	26.9	26.3	25.7	25.0	...	23.8	...	22.4
13	31.7	30.6	29.7	29.0	28.2	27.4	...	26.5	...	25.3
14	31.7	30.7	30.0	29.4	28.8	27.9	...	26.6	...	25.1
15	33.3	32.2	31.3	30.5	29.7	28.8	...	27.9	...	...
16	35.0	33.8	32.8	32.0	31.2	30.3	...	29.3	...	...
17	35.0	33.8	32.8	32.0	31.2	30.3	...	29.3	...	27.9
18	35.0	34.0	33.2	32.5	31.8	30.9	...	29.4	...	27.7
19	40.0	38.7	37.5	36.6	35.6	34.6	...	33.4	...	...
20	43.3	41.9	40.6	39.7	38.6	37.5	...	36.2	...	...
21	46.7	45.1	43.8	42.7	41.5	40.4	...	39.0	...	...
22	50.0	48.4	46.9	45.8	44.5	43.3	...	41.8	...	...
23	28.3	27.2	26.3	25.6	25.0	24.6	24.3	24.0	...	...
24	35.0	33.5	32.4	31.6	30.9	30.2	29.9	29.7	...	...
25	28.3	27.0	26.1	25.3	24.6	23.9	...	23.3	...	...
26	38.3	35.4	33.9	32.7	31.7	30.9	30.5	...	...	...
27	38.3	35.4	33.9	32.7	31.7	30.9	30.5	...	...	...
28	35.0	33.0	31.9	30.6	29.5	28.1	...	26.4	...	24.2
29	33.3	31.8	30.9	29.8	28.9	27.6	...	25.9	...	...
30	33.3	31.8	30.7	29.8	28.9	27.6	...	25.9	...	...
31	35.0	33.4	32.4	31.3	30.3	29.0	...	27.2	...	...
32	40.0	38.2	36.9	35.9	34.7	33.1	...	31.1	...	...
33	43.3	41.4	40.2	38.8	37.6	35.9	...	33.7	...	...
34	46.7	44.6	43.1	41.8	40.5	38.7	...	36.3	...	...
35	50.0	47.8	46.2	44.8	43.4	41.4	...	...	...	...
36	33.3	31.8	30.9	29.8	28.9	27.6	...	25.9	...	...
37	33.3	31.8	30.7	29.8	28.9	27.6	...	25.9	...	...
38	35.0	33.4	32.4	31.3	30.3	29.0	...	27.2	...	...
39	40.0	38.2	36.9	35.9	34.7	33.1	...	31.1	...	...
40	43.3	41.4	40.2	38.8	37.6	35.9	...	33.7	...	...
41	46.7	44.6	43.1	41.8	40.5	38.7	...	36.3	...	...
42	50.0	47.8	46.2	44.8	43.4	41.4	...	...	...	...
43	43.3	41.4	40.2	38.8	37.6	35.9	...	33.7	...	...
44	28.3	27.8	27.3	26.9	26.4	26.0	25.7	25.5	25.2	25.0
45	28.3	27.8	27.3	26.9	26.4	26.0	25.7	25.5	25.2	25.0

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Table 4 (Cont'd)
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Nominal Composition	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/Condition/ Temper	Size/ Thickness, in.
Ferrous Materials (Cont'd)						
1	16Cr-12Ni-2Mo	SA-193	B8M	S31600	1/Sol. treat.	...
2	16Cr-12Ni-2Mo	SA-193	B8MA	S31600	1A/Sol. treat.	...
3	16Cr-12Ni-2Mo-N	SA-193	B8MNA	S31651	1A/Sol. treat.	...
4	18Cr-8Ni	SA-193	B8	S30400	1/Sol. treat.	...
5	18Cr-8Ni	SA-193	B8A	S30400	1A/Sol. treat.	...
6	18Cr-8Ni-N	SA-193	B8NA	S30451	1A/Sol. treat.	...
7	18Cr-8Ni-4Si-N	SA-193	B8S	S21800	Sol. treat.	...
8	18Cr-8Ni-4Si-N	SA-193	B8SA	S21800	Sol. treat.	...
9	18Cr-10Ni-Cb	SA-193	B8C	S34700	1/Sol. treat.	...
10	18Cr-10Ni-Ti	SA-193	B8T	S32100	1/Sol. treat.	...
11	19Cr-9Ni-Mo-W	SA-453	651	S63198	B	>3
12	19Cr-9Ni-Mo-W	SA-453	651	S63198	B	≤3
13	19Cr-9Ni-Mo-W	SA-453	651	S63198	A	>3
14	19Cr-9Ni-Mo-W	SA-453	651	S63198	A	≤3
15	22Cr-13Ni-5Mn	SA-193	B8R	S20910	1C/Sol. treat.	...
16	22Cr-13Ni-5Mn	SA-193	B8RA	S20910	Sol. treat.	...

Table 4 (Cont'd)
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)		Notes
			III	VIII-2	
Ferrous Materials (Cont'd)					
1	75	30	800	800	...
2	75	30	800	800	...
3	75	30	800	800	...
4	75	30	800	800	...
5	75	30	800	800	...
6	75	30	800	800	...
7	95	50	800	800	...
8	95	50	800	800	...
9	75	30	800	800	...
10	75	30	800	800	...
11	95	50	800	800	...
12	95	60	800	800	...
13	100	60	800	800	...
14	100	70	800	800	...
15	100	55	800	800	...
16	100	55	800	800	...

Table 4 (Cont'd)
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
	100	200	300	400	500	600	650	700	750	800
Ferrous Materials (Cont'd)										
1	18.8	17.7	15.6	14.3	13.3	12.6	...	12.1	...	11.7
2	10.0	8.6	7.8	7.2	6.7	6.3	...	6.0	...	5.8
3	18.8	17.8	16.3	15.2	14.2	13.4	13.1	12.8	12.5	12.3
4	18.8	16.7	15.0	13.8	12.9	12.1	...	11.8	...	11.2
5	10.0	8.3	7.5	6.9	6.5	6.1	...	5.9	...	5.6
6	18.8	16.5	14.4	12.9	12.0	11.4	11.2	11.0	10.8	10.6
7	23.8	23.4	21.8	19.7	18.5	17.6	17.3	17.1	16.9	16.7
8	23.8	23.4	21.8	19.7	18.5	17.6	17.3	17.1	16.9	16.7
9	18.8	17.9	16.4	15.5	15.0	14.3	...	13.8	...	13.6
10	18.8	17.8	16.5	15.3	14.3	13.5	...	12.9	...	12.5
11	16.7	15.3	14.2	13.3	12.7	12.0	...	11.5	...	11.1
12	20.0	18.3	17.0	16.0	15.1	14.5	...	13.8	...	13.2
13	20.0	18.3	17.0	16.0	15.1	14.5	...	13.8	...	13.2
14	23.3	21.4	19.8	18.7	17.7	16.9	...	16.1	...	15.4
15	18.3	15.7	14.5	13.6	12.9	12.4	12.3	12.1	11.9	11.8
16	18.3	15.7	14.5	13.6	12.9	12.4	12.3	12.1	11.9	11.8

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Table 4 (Cont'd)
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Nominal Composition	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/Condition/ Temper	Size/ Thickness, in.
Nonferrous Materials						
(23) 1	67Ni-30Cu	SB-164	...	N04400	HW or CW ann.	All
(23) 2	67Ni-30Cu	SB-164	...	N04400	Hot worked	$12 < t \leq 14$
(23) 3	67Ni-30Cu	SB-164	...	N04400	Hot worked	≤ 12
(23) 4	67Ni-30Cu	SB-164	...	N04400	CD-str. rel.	$\leq \frac{1}{2}$
(23) 5	67Ni-30Cu	SB-164	...	N04400	CD-str. rel.	$3\frac{1}{2} < t \leq 4$
(23) 6	67Ni-30Cu	SB-164	...	N04400	As drawn	$\leq \frac{1}{2}$
(23) 7	67Ni-30Cu	SB-164	...	N04400	CD-str. rel.	$\frac{1}{2} < t \leq 3\frac{1}{2}$
(23) 8	67Ni-30Cu	SB-164	...	N04400	As drawn	$\leq \frac{1}{2}$
9	67Ni-30Cu-S	SB-164	...	N04405	Annealed	...
10	67Ni-30Cu-S	SB-164	...	N04405	Hot worked	...
11	67Ni-30Cu-S	SB-164	...	N04405	As drawn	...
12	53Ni-19Cr-19Fe-Cb-Mo	SB-637	...	N07718	Sol. & precip. harden	≤ 6
13	70Ni-16Cr-7Fe-Ti-Al	SB-637	2	N07750	...	< 4

Table 4 (Cont'd)
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Applicability and Max. Temperature Limits (NP = Not Permitted)		Notes
			III	VIII-2	
					Nonferrous Materials
1	70	25	800	800	...
2	75	40	800	800	...
3	80	40	800	800	...
4	84	50	500	500	...
5	84	55	500	500	...
6	85	55	500	500	...
7	87	60	500	500	...
8	110	85	500	500	...
9	70	25	800	800	...
10	75	35	800	800	...
11	85	50	500	500	...
12	185	150	800	800	...
13	170	115	800	800	...

Table 4 (Cont'd)
Section III, Division 1, Classes 1 and MC; Section III, Division 3; and Section III, Division 5
Design Stress Intensity Values, S_m , and Section VIII, Division 2* Maximum Allowable Stress
Values, S , for Bolting Materials
(*Use with Part 5 and Annex 5.F of Section VIII, Division 2)

Line No.	Design Stress Intensity or Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
	100	200	300	400	500	600	650	700	750	800
	Nonferrous Materials									
1	16.7	14.6	13.6	13.2	13.1	13.1	13.1	13.1	...	12.7 (23)
2	16.7	14.6	13.6	13.2	13.1	13.1	13.1	13.1	...	12.7 (23)
3	16.7	14.6	13.6	13.2	13.1	13.1	13.1	13.0	...	12.7 (23)
4	16.7	15.8	15.3	15.0	14.9	...	...	...	...	...
5	18.3	17.4	16.8	16.5	16.4	...	...	...	...	...
6	18.3	17.4	16.8	16.5	16.4	...	...	...	...	...
7	20.0	19.0	18.3	18.0	17.9	...	...	...	...	...
8	28.3	26.9	25.9	25.6	25.4	...	...	...	...	...
9	16.6	14.6	13.6	13.2	13.1	13.1	13.1	13.1	...	12.7
10	18.7	18.7	18.7	18.7	18.7	18.7	18.4	18.0	...	14.5
11	16.6	14.6	13.8	13.2	13.2	...	...	...	...	...
12	50.0	48.0	46.9	46.1	45.6	45.1	...	44.8	...	44.4
13	38.3	37.3	36.8	36.3	36.0	35.8	35.7	35.6	35.5	35.4

NOTES TO TABLE 4**GENERAL NOTES**

- (a) The stress values for bolting materials given in this Table do not exceed the lesser of one-third of the specified minimum yield strength or one-third of the yield strength at temperature, with credit granted for the enhancement of properties produced by heat treatment. They are intended for Section VIII, Division 2 use when flanges are designed in accordance with the rules of Part 5 and Annex 5.F when the bolting requirements are determined in accordance with 5.7.1 and 5.7.2. They are intended for Section III use in the design equations. For allowable values of actual preload and service stresses, see Section III, Subsection NB, NB-3230 and Section III Appendices Nonmandatory Appendix E.
- (b) Stress values for 100°F are applicable for colder temperatures when toughness requirements of Section III or Section VIII are met.
- (c) The following abbreviations are used: CD, Cold drawn; precip., precipitation; rel., relieved; Sol., Solution; str., stress; and treat., treated.
- (d) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-193/SA-193M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-193 Grade B6 shall be used when SA-193M Grade B6 is used in construction.
- (e) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (f) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (g) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - GENERAL REQUIREMENTS

- G1 Stress values may result in relaxation of the bolting materials after prolonged service at temperatures of 500°F and higher, and the designer is to investigate the effect of this relaxation on the application.
- G2 This material has reduced toughness at room temperature after exposure for about 5000 hr at 600°F and after shorter exposure above 650°F.
- G3 Stress values may result in relaxation of the bolting materials after prolonged service at temperatures of 600°F and higher, and the designer is to investigate the effect of this relaxation on the application.
- G4 Stress values may result in relaxation of the bolting materials after prolonged service at temperatures of 700°F and higher, and the designer is to investigate the effect of this relaxation on the application.

Table 5A
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
(23)	1 Carbon steel	Bar, shapes	SA-675	45	...	...	...	1	1
	2 Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
	3 Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
	4 Carbon steel	Bar, shapes	SA-675	50	...	...	...	1	1
	5 ...	...	...	...	...	...	...	...	...
	6 Carbon steel	Plate	SA-285	B	K02200	...	$t \leq 2$	1	1
	7 Carbon steel	Bar, shapes	SA-675	55	...	...	...	1	1
	8 Carbon steel	Plate	SA-285	C	K02801	...	$t \leq 2$	1	1
	9 Carbon steel	Smls. pipe	SA-333	1	K03008	...	...	1	1
	10 Carbon steel	Smls. tube	SA-334	1	K03008	...	...	1	1
	11 Carbon steel	Plate	SA-516	55	K01800	...	...	1	1
	12 Carbon steel	Smls. pipe	SA-524	II	K02104	...	...	1	1
	13 Carbon steel	Plate, bar, shapes	SA-36	...	K02600	...	...	1	1
	14 Carbon steel	Plate	SA-662	A	K01701	...	...	1	1
	15 Carbon steel	Forgings	SA-181	...	K03502	60	...	1	1
	16 Carbon steel	Castings	SA-216	WCA	J02502	...	...	1	1
	17 Carbon steel	Forgings	SA-266	1	K03506	...	...	1	1
	18 Carbon steel	Forgings	SA-350	LF1	K03009	1	...	1	1
	19 Carbon steel	Bar, shapes	SA-675	60	...	...	...	1	1
	20 Carbon steel	Forgings	SA-765	I	K03046	...	...	1	1
	21 Carbon steel	Plate	SA-515	60	K02401	...	...	1	1
	22 Carbon steel	Plate	SA-516	60	K02100	...	...	1	1
	23 Carbon steel	Plate	SA-283	D	K02702	...	...	1	1
	24 Carbon steel	Smls. pipe	SA-106	B	K03006	...	...	1	1
	25 Carbon steel	Fittings	SA-234	WPB	K03006	...	...	1	1
	26 Carbon steel	Smls. pipe	SA-333	6	K03006	...	...	1	1
	27 Carbon steel	Forgings	SA-372	A	K03002	...	...	1	1
	28 Carbon steel	Fittings	SA-420	WPL6	...	...	...	1	1
	29 Carbon steel	Smls. pipe	SA-524	I	K02104	...	...	1	1
	30 Carbon steel	Forgings	SA-727	...	K02506	...	...	1	1
	31 Carbon steel	Wld. tube	SA-178	C	K03503	...	...	1	1
	32 Carbon steel	Smls. tube	SA-210	A-1	K02707	...	...	1	1
	33 Carbon steel	Bar, shapes	SA-675	65	...	...	...	1	1
	34 Carbon steel	Castings	SA-352	LCB	J03003	...	...	1	1
	35 Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
	36 Carbon steel	Plate	SA-516	65	K02403	...	...	1	1
	37 Carbon steel	Plate	SA-662	B	K02203	...	...	1	1
	38 Carbon steel	Plate	SA-537	...	K12437	1	$2\frac{1}{2} < t \leq 4$	1	2
	39 Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	NT or QT	$1.4 < t \leq 6.3$	1	1
	40 Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	Normalized	$t \leq 1.4$	1	1
(23)	41 Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$6 < t \leq 10$	1	2
	42 Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$4 < t \leq 6$	1	2
	43 Carbon steel	Bar, shapes	SA-675	70	...	...	...	1	1
	44 Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2
	45 Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2

Table 5A
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	45	22.5	900	CS-6	G13, T4
2	45	24	900	CS-1	G13, T3
3	48	30	1000	CS-2	G13, T1
4	50	25	900	CS-1	G13, T3
5	...	...	...	...	...
6	50	27	900	CS-1	G13, T3
7	55	27.5	900	CS-1	G13, T4
8	55	30	1000	CS-2	G13, T3
9	55	30	1000	CS-2	T4
10	55	30	700	CS-2	...
11	55	30	1000	CS-2	G13, T3
12	55	30	1000	CS-2	G13, T3
13	58	36	650	CS-2	G13
14	58	40	700	CS-2	...
15	60	30	1000	CS-2	G13, T4
16	60	30	1000	CS-2	G13, T4
17	60	30	1000	CS-2	G13, T4
18	60	30	700	CS-2	G13
19	60	30	900	CS-2	G13, T4
20	60	30	1000	CS-2	G13, T4
21	60	32	1000	CS-2	G13, T3
22	60	32	1000	CS-2	G13, T3
23	60	33	700	CS-2	...
24	60	35	700	CS-2	G13
25	60	35	1000	CS-2	G13, T3
26	60	35	1000	CS-2	G13, T3
27	60	35	650	CS-2	G9, H2
28	60	35	850	CS-2	G13, T3
29	60	35	1000	CS-2	G13, T3
30	60	36	1000	CS-2	G13, T3
31	60	37	1000	CS-2	G6, G13, T2
32	60	37	1000	CS-2	G13, T3
33	65	32.5	1000	CS-2	G13, T3
34	65	35	650	CS-2	...
35	65	35	1000	CS-2	G13, T3
36	65	35	1000	CS-2	G13, T3
37	65	40	700	CS-2	...
38	65	45	700	CS-2	T2
39	66.5	37	1000	CS-2	G13, T3
40	66.5	40.5	1000	CS-2	G13, T3
41	68	40.5	1000	CS-2	G13, T2
42	69.5	43	1000	CS-2	G13, T2
43	70	35	1000	CS-2	G13, T3
44	70	36	1000	CS-2	G13, T3
45	70	36	1000	CS-2	G13, T3

Table 5A
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	15.0	14.1	13.7	13.5	13.3	13.1	12.8	12.5	12.2	11.9	11.5	11.1	10.7	10.4	9.2	7.9	5.9
2	16.0	15.0	14.7	14.4	14.2	13.9	13.7	13.4	13.0	12.7	12.3	11.9	11.5	10.7	9.2	7.9	5.9
3	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.6	14.4	10.7	9.2	7.9	5.9
4	16.7	15.7	15.3	15.0	14.7	14.5	14.2	13.9	13.6	13.2	12.8	12.4	11.9	10.7	9.2	7.9	5.9
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	18.0	16.9	16.5	16.2	15.9	15.7	15.4	15.0	14.7	14.2	13.8	13.3	13.0	10.7	9.2	7.9	5.9
7	18.3	17.2	16.8	16.5	16.2	16.0	15.7	15.3	14.9	14.5	14.1	13.6	13.1	12.7	10.8	8.7	5.9
8	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.0	10.8	8.7	5.9
9	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.8	11.4	8.7	5.9
10	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	...	...	...	...
11	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.0	10.8	8.7	5.9
12	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.0	10.8	8.7	5.9
13	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	...	...	...	...	...
14	24.2	24.2	24.2	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.3	19.2	...	...	...	...
15	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.8	11.4	8.7	5.9
16	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.8	11.4	8.7	5.9
17	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.8	11.4	8.7	5.9
18	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	...	...	...	...
19	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.8	11.4	8.7	5.9
20	20.0	18.8	18.3	18.0	17.7	17.4	17.1	16.7	16.3	15.8	15.3	14.8	14.3	13.8	11.4	8.7	5.9
21	21.3	20.0	19.5	19.2	18.9	18.6	18.2	17.8	17.4	16.9	16.4	15.8	15.3	13.9	11.4	8.7	5.9
22	21.3	20.0	19.5	19.2	18.9	18.6	18.2	17.8	17.4	16.9	16.4	15.8	15.3	13.9	11.4	8.7	5.9
23	22.0	20.7	20.2	19.8	19.5	19.1	18.8	18.4	17.9	17.4	16.9	16.3	15.4	...	...	...	...
24	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.8	...	...	...	...
25	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.8	13.9	11.4	8.7	5.9
26	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.8	13.9	11.4	8.7	5.9
27	23.3	22.4	21.4	20.3	19.3	18.4	17.6	16.9	16.5	16.1	15.8	15.6	...	...	...	...	...
28	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.8	13.9	11.4	8.7	...
29	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.8	13.9	11.4	8.7	5.9
30	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.3	13.9	11.4	8.7	5.9
31	21.0	19.7	19.2	18.8	18.5	18.2	17.9	17.5	17.1	16.6	16.1	15.5	14.4	11.8	9.7	7.4	5.0
32	24.7	23.2	22.6	22.2	21.8	21.5	21.1	20.6	20.1	19.5	18.9	18.3	17.8	13.9	11.4	8.7	5.9
33	21.7	20.4	19.8	19.5	19.2	18.9	18.5	18.1	17.7	17.1	16.6	16.1	15.5	13.9	11.4	9.0	6.3
34	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	...	...	...	...	...
35	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.7	13.9	11.4	9.0	6.3
36	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.7	13.9	11.4	9.0	6.3
37	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.8	19.2	...	...	...	...
38	27.1	27.1	27.1	27.0	26.5	26.1	25.6	25.0	24.5	23.7	23.0	22.3	16.9	...	...	...	...
39	24.7	23.1	22.5	22.0	21.7	21.3	20.9	...	19.9	19.4	18.8	18.1	17.5	14.8	12.0	9.3	6.7
40	27.1	25.3	24.7	24.2	23.8	23.4	23.0	...	21.9	21.3	20.6	19.9	19.2	14.8	12.0	9.3	6.7
41	27.1	25.3	24.7	24.3	24.0	23.6	23.2	22.6	22.1	21.4	20.7	20.0	18.3	14.8	12.0	9.3	6.7
42	28.5	26.7	26.1	25.6	25.2	24.8	24.4	23.8	23.3	22.6	21.9	21.1	18.3	14.8	12.0	9.3	6.7
43	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	19.0	18.5	17.9	17.3	16.7	14.8	12.0	9.3	6.7
44	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
45	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7

Table 5A
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...
3	4.0	2.5	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...
8	4.0	2.5	...	...	...	...	...	...	...	...	...	...
9	4.0	2.5	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...
11	4.0	2.5	...	...	...	...	...	...	...	...	...	...
12	4.0	2.5	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...
15	4.0	2.5	...	...	...	...	...	...	...	...	...	...
16	4.0	2.5	...	...	...	...	...	...	...	...	...	...
17	4.0	2.5	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	4.0	2.5	...	...	...	...	...	...	...	...	...	...
21	4.0	2.5	...	...	...	...	...	...	...	...	...	...
22	4.0	2.5	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	4.0	2.5	...	...	...	...	...	...	...	...	...	...
26	4.0	2.5	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...
29	4.0	2.5	...	...	...	...	...	...	...	...	...	...
30	4.0	2.5	...	...	...	...	...	...	...	...	...	...
31	3.4	2.1	...	...	...	...	...	...	...	...	...	...
32	4.0	2.5	...	...	...	...	...	...	...	...	...	...
33	4.0	2.5	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	4.0	2.5	...	...	...	...	...	...	...	...	...	...
36	4.0	2.5	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...
39	4.0	2.5	...	...	...	...	...	...	...	...	...	...
40	4.0	2.5	...	...	...	...	...	...	...	...	...	...
41	4.0	2.5	...	...	...	...	...	...	...	...	...	...
42	4.0	2.5	...	...	...	...	...	...	...	...	...	...
43	4.0	2.5	...	...	...	...	...	...	...	...	...	...
44	4.0	2.5	...	...	...	...	...	...	...	...	...	...
45	4.0	2.5	...	...	...	...	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Castings	SA-216	WCB	J03002	...	...	1	2
2	Carbon steel	Forgings	SA-266	2	K03506	...	...	1	2
3	Carbon steel	Forgings	SA-266	4	K03017	...	...	1	2
4	Carbon steel	Forgings	SA-350	LF2	K03011	...	...	1	2
5	Carbon steel	Forgings	SA-508	1	K13502	...	...	1	2
6	Carbon steel	Forgings	SA-508	1A	K13502	...	...	1	2
7	Carbon steel	Forgings	SA-541	1	K03506	...	...	1	2
8	Carbon steel	Forgings	SA-541	1A	K03020	...	...	1	2
9	Carbon steel	Forgings	SA-765	II	K03047	...	...	1	2
10	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2
11	Carbon steel	Plate	SA-516	70	K02700	...	...	1	2
12	Carbon steel	Smls. pipe	SA-106	C	K03501	...	...	1	2
13	Carbon steel	Smls. tube	SA-210	C	K03501	...	...	1	2
14	Carbon steel	Castings	SA-216	WCC	K02503	...	...	1	2
15	Carbon steel	Fittings	SA-234	WPC	K03501	...	...	1	2
(23) 16	Carbon steel	Plate	SA-537	...	K12437	3	$4 < t \leq 6$	1	3
17	Carbon steel	Plate	SA-662	C	K02007	...	...	1	2
18	Carbon steel	Plate	SA-537	...	K12437	2	$4 < t \leq 6$	1	3
19	Carbon steel	Plate	SA-738	C	K02008	...	$4 < t \leq 6$	1	3
(23) 20	Carbon steel	Plate	SA-537	...	K12437	1	$t \leq 2\frac{1}{2}$	1	2
21	Carbon steel	Plate	SA-841	A	...	1	$t \leq 4$	1	2
22	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	NT	$1.4 < t \leq 6.3$	1	2
23	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	Normalized	$t \leq 1.4$	1	2
24	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$2.5 < t \leq 4$	1	2
25	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	QT	$t \leq 2.8$	1	2
26	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$1.5 < t \leq 2.5$	1	2
27	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$\frac{5}{8} < t \leq 1.5$	1	2
28	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$\leq \frac{5}{8}$	1	2
(23) 29	Carbon steel	Forgings	SA-266	3	K05001	...	...	1	2
30	Carbon steel	Plate	SA-299	A	K02803	...	$t > 1$	1	2
31	Carbon steel	Plate	SA-299	A	K02803	...	$t \leq 1$	1	2
32	Carbon steel	Forgings	SA-372	B	K04001	...	...	1	2
33	Carbon steel	Plate	SA-738	A	K12447	Normalized	$t \leq 2\frac{1}{2}$	1	2
34	Carbon steel	Plate	SA-738	A	K12447	QT	...	1	2
(23) 35	Carbon steel	Plate	SA-537	...	K12437	3	$2\frac{1}{2} < t \leq 4$	1	3
(23) 36	Carbon steel	Plate	SA-537	...	K12437	2	$2\frac{1}{2} < t \leq 4$	1	3
37	Carbon steel	Plate	SA-738	C	K02008	...	$2\frac{1}{2} < t \leq 4$	1	3
38	Carbon steel	Plate	SA-299	B	K02803	...	$t > 1$	1	3
39	Carbon steel	Plate	SA-299	B	K02803	...	$t \leq 1$	1	3
40	Carbon steel	Forgings	SA-765	IV	K02009	...	...	1	3
(23) 41	Carbon steel	Plate	SA-537	...	K12437	3	$t \leq 2\frac{1}{2}$	1	3
(23) 42	Carbon steel	Plate	SA-537	...	K12437	2	$t \leq 2\frac{1}{2}$	1	3
43	Carbon steel	Plate	SA-738	C	K02008	...	$t \leq 2\frac{1}{2}$	1	3
44	Carbon steel	Plate	SA-841	B	...	2	$t \leq 4$	1	3
45	Carbon steel	Plate	SA-612	...	K02900	Normalized	$\frac{1}{2} < t \leq 1$	10C	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	70	36	1000	CS-2	G13, T3
2	70	36	1000	CS-2	G13, T3
3	70	36	1000	CS-2	G13, T3
4	70	36	1000	CS-2	G13, T2
5	70	36	1000	CS-2	G13, T3
6	70	36	1000	CS-2	G13, T3
7	70	36	1000	CS-2	G13, T3
8	70	36	1000	CS-2	G13, T3
9	70	36	1000	CS-2	G13, T3
10	70	38	1000	CS-2	G13, T3
11	70	38	1000	CS-2	G13, T3
12	70	40	1000	CS-2	G13, T3
13	70	40	1000	CS-2	G13, T3
14	70	40	1000	CS-2	G13, T3
15	70	40	800	CS-2	G13, T3
16	70	40	700	CS-2	...
17	70	43	700	CS-3	...
18	70	46	650	CS-3	...
19	70	46	650	CS-3	T1
20	70	50	700	CS-3	T2
21	70	50	650	CS-3	...
22	71	40.5	1000	CS-2	G13, T3
23	71	44	1000	CS-2	G13, T2
24	71	45.5	1000	CS-2	G13, T2
25	74	41.5	1000	CS-2	G13, T3
26	74	48.5	1000	CS-2	G13, T2
27	74	50	1000	CS-2	G13, T2
28	74	51.5	1000	CS-2	G13, T2
29	75	37.5	1000	CS-2	G13, T3, W6
30	75	40	1000	CS-2	G13, T3
31	75	42	1000	CS-2	G13, T2
32	75	45	650	CS-3	G9, H2, W2, W6
33	75	45	700	CS-2	...
34	75	45	700	CS-2	...
35	75	50	700	CS-5	T2
36	75	55	650	CS-5	...
37	75	55	650	CS-5	T1
38	80	45	1000	CS-3	G13, T2
39	80	47	1000	CS-3	G13, T2
40	80	50	700	CS-3	T1
41	80	55	700	CS-5	T2
42	80	60	650	CS-5	...
43	80	60	650	CS-5	...
44	80	60	650	CS-3	...
45	81	50	650	CS-3	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
2	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
3	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
4	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	16.9	13.9	11.4	8.7	5.9
5	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
6	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
7	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
8	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
9	24.0	22.6	22.0	21.6	21.2	20.9	20.5	20.1	19.6	19.0	18.4	17.8	17.2	14.8	12.0	9.3	6.7
10	25.3	23.8	23.2	22.8	22.4	22.1	21.6	21.2	20.6	20.1	19.4	18.8	18.1	14.8	12.0	9.3	6.7
11	25.3	23.8	23.2	22.8	22.4	22.1	21.6	21.2	20.6	20.1	19.4	18.8	18.1	14.8	12.0	9.3	6.7
12	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.8	19.2	14.8	12.0	9.3	6.7
13	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.8	19.2	14.8	12.0	9.3	6.7
14	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.8	19.2	14.8	12.0	9.3	6.7
15	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.8	19.2	14.8	12.0	...	...
16	26.7	24.7	23.5	22.5	21.6	20.8	20.0	19.4	18.9	18.4	18.0	17.6	17.2	...	...	...	...
17	28.7	26.9	26.3	25.8	25.4	25.0	24.5	24.0	23.4	22.7	22.0	21.2	20.7	...	...	...	...
18	29.2	28.4	27.1	25.9	24.8	23.9	23.1	22.4	21.7	21.2	20.7	20.2	...	...	...	...	...
19	29.2	28.8	28.1	27.6	27.1	26.7	26.2	25.6	25.0	24.3	23.5	22.5	...	...	...	...	...
20	29.2	29.2	29.2	28.1	27.0	26.0	25.1	24.3	23.6	23.0	22.5	22.0	18.3	...	...	...	...
21	29.2	29.2	29.2	29.2	29.2	28.6	28.2	...	27.5	27.2	26.8	26.2	...	...	...	...	...
22	27.1	25.3	24.7	24.2	23.8	23.4	23.0	...	21.9	21.3	20.6	19.9	19.2	14.8	12.0	9.3	6.7
23	29.5	27.6	26.9	26.3	25.9	25.5	25.0	...	23.9	23.2	22.5	21.7	20.0	14.8	12.0	9.3	6.7
24	29.6	28.5	27.8	27.3	26.9	26.5	26.1	25.4	24.8	24.1	23.3	22.5	18.3	14.8	12.0	9.3	6.7
25	27.6	25.8	25.1	24.6	24.2	23.8	23.4	...	22.3	21.7	21.0	20.3	19.6	14.8	12.0	9.3	6.7
26	30.8	30.3	29.6	29.1	28.7	28.2	27.7	27.1	26.4	25.6	24.8	24.0	18.3	14.8	12.0	9.3	6.7
27	30.8	30.8	30.5	30.0	29.5	29.1	28.5	27.9	27.2	26.4	25.6	24.7	18.3	14.8	12.0	9.3	6.7
28	30.8	30.8	30.8	30.8	30.4	29.9	29.4	28.7	28.0	27.2	26.3	25.4	18.3	14.8	12.0	9.3	6.7
29	25.0	23.5	22.9	22.5	22.1	21.8	21.4	20.9	20.4	19.8	19.2	18.5	17.9	15.7	12.6	9.3	6.7
30	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.7	21.1	20.4	19.8	19.1	15.7	12.6	9.3	6.7
31	28.0	26.3	25.7	25.2	24.8	24.4	23.9	23.4	22.8	22.2	21.5	20.8	19.6	15.7	12.6	9.3	6.7
32	30.0	28.2	27.5	27.0	26.5	26.1	25.6	25.1	24.4	23.7	23.0	22.2	...	...	...	...	...
33	30.0	27.8	26.5	25.3	24.3	23.4	22.6	21.9	21.2	20.7	20.2	19.7	19.3	...	...	...	...
34	30.0	27.8	26.5	25.3	24.3	23.4	22.6	21.9	21.2	20.7	20.2	19.7	19.3	...	...	...	...
35	31.3	30.9	29.5	28.1	27.0	26.0	25.1	24.3	23.6	23.0	22.5	22.0	18.3	...	...	...	...
36	31.3	31.3	31.3	30.9	29.7	28.6	27.5	26.7	25.9	25.3	24.7	24.2	...	...	...	...	...
37	31.3	31.3	31.3	31.3	31.3	31.2	30.5	29.9	29.3	28.8	28.3	24.4	...	...	...	...	...
38	30.0	28.1	27.5	27.0	26.5	26.1	25.6	...	24.4	23.7	23.0	22.2	19.6	15.7	12.6	9.3	6.7
39	31.3	29.4	28.7	28.2	27.7	27.3	26.8	...	25.5	24.8	24.0	23.2	19.6	15.7	12.6	9.3	6.7
40	33.3	31.3	30.5	30.0	29.5	29.0	28.5	27.9	27.2	26.4	25.6	24.4	19.6	...	...	...	...
41	33.3	33.3	32.4	30.9	29.7	28.6	27.5	26.7	25.9	25.3	24.7	24.2	19.6	...	...	...	...
42	33.3	33.3	33.3	33.3	32.4	31.2	30.1	29.2	28.3	27.6	27.0	26.4	...	...	...	...	...
43	33.3	33.3	33.3	33.3	33.3	33.3	33.3	32.6	32.0	31.4	30.8	26.0	...	...	...	...	...
44	33.3	...	33.3	...	33.3	...	33.3	...	33.0	32.6	32.1	31.4	...	...	...	...	...
45	33.3	31.9	30.6	29.1	27.6	26.2	25.1	24.2	23.5	23.0	22.6	22.3	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	4.0	2.5	...	...	...	...	...	...	...	...	...	...
2	4.0	2.5	...	...	...	...	...	...	...	...	...	...
3	4.0	2.5	...	...	...	...	...	...	...	...	...	...
4	4.0	2.5	...	...	...	...	...	...	...	...	...	...
5	4.0	2.5	...	...	...	...	...	...	...	...	...	...
6	4.0	2.5	...	...	...	...	...	...	...	...	...	...
7	4.0	2.5	...	...	...	...	...	...	...	...	...	...
8	4.0	2.5	...	...	...	...	...	...	...	...	...	...
9	4.0	2.5	...	...	...	...	...	...	...	...	...	...
10	4.0	2.5	...	...	...	...	...	...	...	...	...	...
11	4.0	2.5	...	...	...	...	...	...	...	...	...	...
12	4.0	2.5	...	...	...	...	...	...	...	...	...	...
13	4.0	2.5	...	...	...	...	...	...	...	...	...	...
14	4.0	2.5	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	(23)
18	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	(23)
21	...	...	...	...	...	...	...	...	...	...	...	...
22	4.0	2.5	...	...	...	...	...	...	...	...	...	...
23	4.0	2.5	...	...	...	...	...	...	...	...	...	...
24	4.0	2.5	...	...	...	...	...	...	...	...	...	...
25	4.0	2.5	...	...	...	...	...	...	...	...	...	...
26	4.0	2.5	...	...	...	...	...	...	...	...	...	...
27	4.0	2.5	...	...	...	...	...	...	...	...	...	...
28	4.0	2.5	...	...	...	...	...	...	...	...	...	...
29	4.0	2.5	...	...	...	...	...	...	...	...	...	...
30	4.0	2.5	...	...	...	...	...	...	...	...	...	(23)
31	4.0	2.5	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	(23)
36	...	...	...	...	...	...	...	...	...	...	...	(23)
37	...	...	...	...	...	...	...	...	...	...	...	...
38	4.0	2.5	...	...	...	...	...	...	...	...	...	...
39	4.0	2.5	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	(23)
42	...	...	...	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Plate	SA-612	...	K02900	Normalized	$t \leq \frac{1}{2}$	10C	1
2	Carbon steel	Plate	SA-738	B	K12007	...	...	1	3
3	Carbon steel	Forgings	SA-372	C	K04801	...	...	...	...
4	Carbon steel	Plate	SA-724	A	K11831	...	...	1	4
5	Carbon steel	Plate	SA-724	C	K12037	...	...	1	4
6	Carbon steel	Plate	SA-724	B	K12031	...	...	1	4
7	C-Mn-Si-Cb	Plate	SA-737	B	K12001	...	...	1	2
8	C-Mn-Si-V	Plate	SA-737	C	K12202	...	...	1	3
9	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1b	K11422	...	...	3	1
10	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1	K11522	...	...	3	1
11	C- $\frac{1}{2}$ Mo	Fittings	SA-234	WP1	K12821	...	...	3	1
12	C- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P1	K11522	...	...	3	1
13	C- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP1	K11522	...	...	3	1
14	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1a	K12023	...	...	3	1
15	C- $\frac{1}{2}$ Mo	Castings	SA-217	WC1	J12524	...	...	3	1
16	C- $\frac{1}{2}$ Mo	Castings	SA-352	LC1	J12522	...	...	3	1
17	C- $\frac{1}{2}$ Mo	Plate	SA-204	A	K11820	...	...	3	1
18	C- $\frac{1}{2}$ Mo	Forgings	SA-182	F1	K12822	...	...	3	2
19	C- $\frac{1}{2}$ Mo	Plate	SA-204	B	K12020	...	...	3	2
20	C- $\frac{1}{2}$ Mo	Forgings	SA-336	F1	K12520	...	...	3	2
21	C- $\frac{1}{2}$ Mo	Plate	SA-204	C	K12320	...	...	3	2
22	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	70	...	11B	...
23	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	70	...	11B	...
24	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo-V	Plate	SA-517	B	K11630	...	$t \leq \frac{1}{4}$	11B	4
25	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Plate	SA-517	A	K11856	...	$t \leq \frac{1}{4}$	11B	1
26	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Forgings	SA-592	A	K11856	...	$t \leq 2\frac{1}{2}$	11B	1
27	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P2	K11547	...	...	3	1
28	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP2	K11547	...	...	3	1
29	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143	1	...	3	1
30	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T2	K11547	...	...	3	1
31	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F2	K12122	...	...	3	2
32	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143	2/NT	...	3	2
33	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Ni-Cu	Smls. tube	SA-423	1	K11535	...	...	4	2
34	$\frac{3}{4}$ Cr- $\frac{3}{4}$ Ni-Cu-Al	Smls. pipe	SA-333	4	K11267	...	...	4	2
35	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047	70	...	11B	1
36	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	70	...	11B	1
37	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548	70	...	11B	1
38	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	G41370	110	...	11B	1
39	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	1	...	4	1
40	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11562	1	...	4	1
41	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T12	K11562	...	...	4	1
42	1Cr- $\frac{1}{2}$ Mo	Fittings	SA-234	WP12	K12062	1	...	4	1
43	1Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P12	K11562	...	...	4	1
44	1Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP12	K11562	...	...	4	1
45	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$10 < t \leq 20$	4	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	83	50	650	CS-3	...
2	85	60	650	CS-5	T1
3	90	55	650	CS-3	G9, H2, T1, W2, W6
4	90	70	700	CS-5	...
5	90	70	700	CS-5	...
6	95	75	700	CS-5	...
7	70	50	700	CS-3	...
8	80	60	700	CS-3	...
9	53	28	1000	CS-1	G14, T7
10	55	30	1000	CS-2	G14, T6
11	55	30	1000	CS-2	G14, T6
12	55	30	1000	CS-2	G14, T6
13	55	30	1000	CS-2	G14, T6
14	60	32	1000	CS-2	G14, T6
15	65	35	1000	CS-2	G14, T6
16	65	35	650	CS-2	...
17	65	37	1000	CS-2	G14, T6
18	70	40	1000	CS-2	G14, T6
19	70	40	1000	CS-2	G14, T6
20	70	40	1000	CS-2	G14, T6
21	75	43	1000	CS-2	G14, T6
22	120	70	200	CS-3	G9, H4, W2, W6
23	120	70	200	CS-3	G9, H4, W2, W6
24	115	100	650	HT-1	...
25	115	100	650	HT-1	...
26	115	100	650	HT-1	...
27	55	30	1000	CS-2	T7
28	55	30	1000	CS-2	T7
29	55	33	1000	CS-2	T6
30	60	30	1000	CS-2	T7
31	70	40	1000	CS-2	G14, T6
32	70	45	1000	CS-3	T6
33	60	37	650	CS-2	...
34	60	35	650	CS-2	...
35	120	70	650	CS-5	G9, H4, W2, W6
36	120	70	650	CS-5	G9, H4, W2, W6
37	120	70	650	CS-5	G9, H4, W2, W6
38	135	110	650	HT-1	H4, W2, W6
39	55	33	1200	CS-2	T7
40	60	32	1200	CS-2	T7
41	60	32	1200	CS-2	T7
42	60	32	1200	CS-2	T7
43	60	32	1200	CS-2	T7
44	60	32	1200	CS-2	T7
45	61	35	1200	CS-2	T7

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	33.3	31.9	30.6	29.1	27.6	26.2	25.1	24.2	23.5	23.0	22.6	22.3	...	...	...	...	...
2	35.4	35.4	35.4	35.4	34.8	34.0	33.3	32.6	32.0	31.4	30.8	24.4	...	...	...	...	...
3	36.7	35.1	33.6	32.0	30.3	28.9	27.6	26.6	25.9	25.3	24.9	24.4	...	...	...	...	...
4	37.5	37.5	37.5	37.5	37.5	36.7	35.2	33.9	32.9	32.2	31.7	26.2	25.9	...	...	...	...
5	37.5	37.5	37.5	37.5	37.5	36.7	35.2	33.9	32.9	32.2	31.7	26.2	25.9	...	...	...	...
6	39.6	39.6	39.6	39.6	39.6	39.4	37.7	36.3	35.3	34.5	33.9	26.2	25.9	...	...	...	...
7	29.2	29.2	29.2	29.1	27.6	26.2	25.1	24.2	23.5	23.0	22.6	22.3	22.1	...	...	...	...
8	33.3	33.3	33.3	33.3	33.1	31.5	30.1	29.1	28.2	27.6	27.1	26.2	25.9	...	...	...	...
9	18.7	18.0	17.5	17.2	16.8	16.5	16.3	16.0	15.8	15.5	15.3	15.0	14.7	14.3	14.0	13.5	13.0
10	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.7
11	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.7
12	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.7
13	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.7
14	21.3	20.5	20.1	19.6	19.2	18.9	18.6	18.3	18.0	17.7	17.4	17.1	16.8	16.4	15.9	15.4	13.7
15	23.3	22.5	21.9	21.5	21.0	20.7	20.3	20.0	19.7	19.4	19.1	18.7	18.4	17.9	17.4	16.9	13.7
16	23.3	22.5	21.9	21.5	21.0	20.7	20.3	20.0	19.7	19.4	19.1	18.7	...	...	...	...	...
17	24.7	23.7	23.2	22.7	22.2	21.8	21.5	21.1	20.8	20.5	20.2	19.8	19.4	19.0	18.4	17.9	13.7
18	26.7	25.7	25.1	24.5	24.0	23.6	23.2	22.9	22.5	22.2	21.8	21.4	21.0	20.5	19.9	19.3	13.7
19	26.7	25.7	25.1	24.5	24.0	23.6	23.2	22.9	22.5	22.2	21.8	21.4	21.0	20.5	19.9	19.3	13.7
20	26.7	25.7	25.1	24.5	24.0	23.6	23.2	22.9	22.5	22.2	21.8	21.4	21.0	20.5	19.9	19.3	13.7
21	28.7	27.6	26.9	26.4	25.9	25.4	25.0	24.6	24.2	23.8	23.4	23.0	22.6	22.0	21.4	20.7	13.7
22	46.7	46.7	46.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	46.7	46.7	46.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
25	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
26	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
27	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.9
28	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.9
29	22.0	21.2	20.7	20.2	19.8	19.5	19.2	18.9	18.6	18.3	18.0	17.7	17.3	16.9	16.4	15.9	14.3
30	20.0	19.2	18.8	18.4	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.7	15.4	14.9	14.5	13.9
31	26.7	25.7	25.1	24.5	24.0	23.6	23.2	22.9	22.5	22.2	21.8	21.4	21.0	20.5	19.9	19.3	15.0
32	29.2	28.9	28.2	27.6	27.1	26.6	26.1	25.7	25.3	24.9	24.5	24.1	23.6	23.1	22.4	21.7	14.5
33	24.7	23.3	22.7	22.3	22.0	21.8	21.5	21.3	21.1	20.9	20.6	20.3	...	...	...	...	...
34	23.3	22.1	21.5	21.1	20.8	20.6	20.4	20.2	20.0	19.7	19.5	19.2	...	...	...	...	...
35	46.7	44.5	43.5	42.6	41.9	41.2	40.6	40.0	39.4	38.7	37.9	36.9	...	...	...	...	...
36	46.7	44.5	43.5	42.6	41.9	41.2	40.6	40.0	39.4	38.7	37.9	36.9	...	...	...	...	...
37	46.7	44.5	43.5	42.6	41.9	41.2	40.6	40.0	39.4	38.7	37.9	36.9	...	...	...	...	...
38	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	...	...	...	...	...
39	22.0	20.6	19.9	19.2	18.7	18.2	17.9	17.5	17.2	17.0	16.8	16.5	16.3	16.0	15.7	15.4	15.0
40	21.3	20.0	19.3	18.7	18.1	17.7	17.3	17.0	16.7	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
41	21.3	20.0	19.3	18.7	18.1	17.7	17.3	17.0	16.7	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
42	21.3	20.0	19.3	18.7	18.1	17.7	17.3	17.0	16.7	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
43	21.3	20.0	19.3	18.7	18.1	17.7	17.3	17.0	16.7	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
44	21.3	20.0	19.3	18.7	18.1	17.7	17.3	17.0	16.7	16.5	16.3	16.0	15.8	15.5	15.3	14.9	14.5
45	23.2	21.9	21.1	20.4	19.8	19.3	18.9	...	18.2	18.0	17.8	17.5	17.3	17.0	16.6	16.3	15.8

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	8.2	4.8	...	...	...	...	...	...	...	...	...	...
10	8.2	4.8	...	...	...	...	...	...	...	...	...	...
11	8.2	4.8	...	...	...	...	...	...	...	...	...	...
12	8.2	4.8	...	...	...	...	...	...	...	...	...	...
13	8.2	4.8	...	...	...	...	...	...	...	...	...	...
14	8.2	4.8	...	...	...	...	...	...	...	...	...	...
15	8.2	4.8	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...
17	8.2	4.8	...	...	...	...	...	...	...	...	...	...
18	8.2	4.8	...	...	...	...	...	...	...	...	...	...
19	8.2	4.8	...	...	...	...	...	...	...	...	...	...
20	8.2	4.8	...	...	...	...	...	...	...	...	...	...
21	8.2	4.8	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	9.2	5.9	...	...	...	...	...	...	...	...	...	...
28	9.2	5.9	...	...	...	...	...	...	...	...	...	...
29	9.2	5.9	...	...	...	...	...	...	...	...	...	...
30	9.2	5.9	...	...	...	...	...	...	...	...	...	...
31	9.2	5.9	...	...	...	...	...	...	...	...	...	...
32	10.0	6.3	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...
39	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
40	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
41	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
42	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
43	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
44	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
45	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$6 < t \leq 10$	4	1
2	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$4 < t \leq 6$	4	1
3	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$4 < t \leq 10$	4	1
4	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$2.5 < t \leq 4$	4	1
5	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$2.8 < t \leq 4$	4	1
6	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT	$1.4 < t \leq 2.8$	4	1
7	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT	$t \leq 1.4$	4	1
8	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	2	...	4	1
9	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$\frac{5}{8} < t \leq 2.5$	4	1
10	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$t \leq \frac{5}{8}$	4	1
11	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11564	2	...	4	1
12	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F12	K11564	...	...	4	1
13	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC6	J12072	...	...	4	1
14	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Bar	SA-739	B11	K11797	...	...	4	1
15	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11597	1	...	4	1
16	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T11	K11597	...	...	4	1
17	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Fittings	SA-234	WP11	...	1	...	4	1
18	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P11	K11597	...	...	4	1
19	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forged pipe	SA-369	FP11	K11597	...	...	4	1
20	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	1	...	4	1
21	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11572	2	...	4	1
22	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	2	...	4	1
23	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	$4 < t \leq 10$	4	1
24	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	$2.25 < t \leq 4$	4	1
25	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	≤ 2.25	4	1
26	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	3	...	4	1
27	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	2	...	4	1
28	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...	$2\frac{1}{2} < t \leq 4$	11B	2
29	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...	$t \leq 2\frac{1}{2}$	11B	2
30	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...	$2\frac{1}{2} < t \leq 6$	11B	2
31	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...	$t \leq 2\frac{1}{2}$	11B	2
32	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	1	...	5A	1
33	$2\frac{1}{4}$ Cr-1Mo	Smls. tube	SA-213	T22	K21590	...	...	5A	1
34	$2\frac{1}{4}$ Cr-1Mo	Fittings	SA-234	WP22	K21590	1	...	5A	1
35	$2\frac{1}{4}$ Cr-1Mo	Smls. pipe	SA-335	P22	K21590	...	...	5A	1
36	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	1	...	5A	1
37	$2\frac{1}{4}$ Cr-1Mo	Forged pipe	SA-369	FP22	K21590	...	...	5A	1
38	$2\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	1	...	5A	1
39	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$6 < t \leq 10$	5A	1
40	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT or QT	$8 < t \leq 20$	5A	1
41	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$4 < t \leq 6$	5A	1
42	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$2.5 < t \leq 4$	5A	1
43	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$1.5 < t \leq 2.5$	5A	1
44	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$\frac{5}{8} < t \leq 1.5$	5A	1
45	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	$t \leq \frac{5}{8}$	5A	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	61	35.5	1200	CS-2	T7
2	62.5	37	1200	CS-2	T7
3	64	38.5	1200	CS-2	T7
4	64	39	1200	CS-2	T7
5	64	40	1200	CS-2	T6
6	64	41.5	1200	CS-2	T6
7	64	43	1200	CS-2	T6
8	65	40	1200	CS-2	T6
9	65.5	42	1200	CS-2	T6
10	65.5	43.5	1200	CS-2	T6
11	70	40	1200	CS-2	T6
12	70	40	1200	CS-2	T6
13	70	40	1100	CS-2	T6
14	70	45	1200	CS-3	T5
15	60	30	1200	CS-2	T7
16	60	30	1200	CS-2	T7
17	60	30	1200	CS-2	T7
18	60	30	1200	CS-2	T7
19	60	30	1200	CS-2	T7
20	60	35	1200	CS-2	T6
21	70	40	1200	CS-2	T7
22	70	40	1200	CS-2	T7
23	71	55	1058	CS-3	G15, T5
24	72.5	56.5	1058	CS-3	G15, T5
25	74	58	1058	CS-3	G15, T5
26	75	45	1200	CS-3	T5
27	75	45	1200	CS-3	T5
28	105	90	650	CS-5	S1
29	115	100	650	HT-1	...
30	105	90	650	CS-5	...
31	115	100	650	HT-1	...
32	60	30	1200	CS-2	T5, W5
33	60	30	1200	CS-2	T5, W5
34	60	30	1200	CS-2	T5, W5
35	60	30	1200	CS-2	T5, W5
36	60	30	1200	CS-2	T5, W5
37	60	30	1200	CS-2	T5, W5
38	60	30	1200	CS-2	H1, T5, W5
39	65.5	36.5	1100	CS-3	T6, W5
40	65.5	38.5	1200	CS-3	T6, W5
41	66.5	37.5	1100	CS-3	T6, W5
42	68	40.5	1100	CS-3	T6, W5
43	69.5	42	1100	CS-3	T6, W5
44	69.5	43.5	1100	CS-3	T6, W5
45	69.5	45	1100	CS-3	T5, W5

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	23.7	22.2	21.4	20.7	20.2	19.7	19.2	18.9	18.6	18.3	18.1	17.8	17.5	17.3	16.9	16.5	16.1
2	24.7	23.1	22.3	21.6	21.0	20.5	20.0	19.7	19.3	19.1	18.8	18.5	18.3	18.0	17.6	17.2	16.8
3	25.6	24.1	23.3	22.5	21.9	21.3	20.9	...	20.1	19.9	19.6	19.4	19.1	18.8	18.4	17.9	17.5
4	26.1	24.5	23.6	22.9	22.2	21.7	21.2	20.8	20.5	20.2	19.9	19.6	19.3	19.0	18.7	18.2	17.7
5	26.6	25.1	24.2	23.4	22.7	22.1	21.6	...	20.9	20.6	20.4	20.1	19.8	19.5	19.1	18.6	18.0
6	26.6	26.0	25.1	24.2	23.5	22.9	22.4	...	21.7	21.4	21.1	20.8	20.5	20.2	19.8	19.3	18.0
7	26.6	26.6	25.9	25.1	24.4	23.7	23.2	...	22.4	22.1	21.8	21.5	21.2	20.9	20.5	20.0	18.0
8	26.7	25.0	24.1	23.3	22.7	22.1	21.7	21.3	20.9	20.6	20.3	20.0	19.7	19.4	19.1	18.6	18.0
9	27.2	26.3	25.4	24.6	23.9	23.3	22.8	22.4	22.0	21.7	21.4	21.1	20.8	20.4	20.0	19.6	18.0
10	27.2	27.2	26.2	25.4	24.7	24.1	23.6	23.2	22.7	22.4	22.1	21.8	21.5	21.1	20.7	20.2	18.0
11	26.7	25.0	24.1	23.3	22.7	22.1	21.7	21.3	20.9	20.6	20.3	20.0	19.7	19.4	19.1	18.6	18.0
12	26.7	25.0	24.1	23.3	22.7	22.1	21.7	21.3	20.9	20.6	20.3	20.0	19.7	19.4	19.1	18.6	18.0
13	26.7	25.4	24.6	24.0	23.4	22.9	22.5	22.0	21.7	21.3	20.9	20.5	20.1	19.7	19.2	18.7	13.7
14	29.2	28.5	27.7	27.0	26.3	25.8	25.3	24.8	24.4	23.9	23.5	23.1	22.6	22.2	21.6	20.2	13.7
15	20.0	19.0	18.5	18.0	17.6	17.2	16.8	16.5	16.2	16.0	15.7	15.4	15.1	14.8	14.4	14.0	13.6
16	20.0	19.0	18.5	18.0	17.6	17.2	16.8	16.5	16.2	16.0	15.7	15.4	15.1	14.8	14.4	14.0	13.6
17	20.0	19.0	18.5	18.0	17.6	17.2	16.8	16.5	16.2	16.0	15.7	15.4	15.1	14.8	14.4	14.0	13.6
18	20.0	19.0	18.5	18.0	17.6	17.2	16.8	16.5	16.2	16.0	15.7	15.4	15.1	14.8	14.4	14.0	13.6
19	20.0	19.0	18.5	18.0	17.6	17.2	16.8	16.5	16.2	16.0	15.7	15.4	15.1	14.8	14.4	14.0	13.6
20	23.3	22.2	21.5	21.0	20.5	20.0	19.6	19.3	18.9	18.6	18.3	18.0	17.6	17.2	16.8	16.4	13.7
21	26.7	25.4	24.6	24.0	23.4	22.9	22.5	22.0	21.7	21.3	20.9	20.5	20.1	19.7	19.2	18.7	13.7
22	26.7	25.4	24.6	24.0	23.4	22.9	22.5	22.0	21.7	21.3	20.9	20.5	20.1	19.7	19.2	18.7	13.7
23	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.4	28.7	28.0	20.2	13.7
24	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	29.5	28.8	20.2	13.7
25	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.3	29.5	20.2	13.7
26	30.0	28.5	27.7	27.0	26.3	25.8	25.3	24.8	24.4	23.9	23.5	23.1	22.6	22.2	21.6	20.2	13.7
27	30.0	28.5	27.7	27.0	26.3	25.8	25.3	24.8	24.4	23.9	23.5	23.1	22.6	22.2	21.6	20.2	13.7
28	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
29	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
30	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
31	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
32	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
33	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
34	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
35	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
36	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
37	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
38	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	17.1	13.6
39	24.2	22.8	22.1	21.6	21.1	20.8	20.5	20.3	20.0	19.8	19.6	19.4	19.1	18.8	18.4	18.0	15.8
40	25.6	24.2	23.5	22.9	22.4	22.0	21.7	...	21.2	21.0	20.8	20.6	20.3	20.0	19.5	19.0	15.8
41	25.1	23.7	23.0	22.4	22.0	21.6	21.3	21.1	20.8	20.6	20.4	20.2	19.9	19.6	19.2	18.7	15.8
42	27.1	25.5	24.8	24.2	23.7	23.3	22.9	22.7	22.4	22.2	22.0	21.7	21.4	21.1	20.7	20.1	15.8
43	28.0	26.5	25.7	25.0	24.5	24.1	23.8	23.5	23.2	23.0	22.8	22.5	22.2	21.8	21.4	20.9	15.8
44	29.0	27.4	26.6	25.9	25.4	24.9	24.6	24.3	24.0	23.8	23.6	23.3	23.0	22.6	22.1	21.6	15.8
45	29.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.1	23.7	23.3	22.9	21.9	15.8

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
2	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
3	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
4	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
5	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
6	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
7	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
8	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
9	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
10	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
11	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
12	11.3	7.2	4.5	2.8	1.8	1.1	...	...	...	...	...	...
13	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...
14	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
15	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
16	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
17	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
18	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
19	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
20	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
21	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
22	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
23	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...
24	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...
25	9.3	6.3	4.2	2.8	...	...	...	...	...	...	...	...
26	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
27	9.3	6.3	4.2	2.8	1.9	1.2	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...
32	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
33	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
34	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
35	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
36	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
37	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
38	10.8	8.0	5.7	3.8	2.4	1.4	...	...	...	...	...	...
39	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...
40	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
41	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...
42	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...
43	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...
44	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...
45	11.4	7.8	5.1	3.2	...	...	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	P-No.	Group No.
1	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-217	WC9	J21890	...	...	5A	1
2	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	3	...	5A	1
3	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	3	...	5A	1
4	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	2	...	5A	1
5	2 $\frac{1}{4}$ Cr-1Mo	Bar	SA-739	B22	K21390	...	...	5A	1
6	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT	$t \leq 8$	5A	1
7	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-487	8	J22091	A	...	5C	1
8	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-508	22	K21590	3	...	5C	1
9	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	3	...	5C	1
10	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-542	B	K21590	4	...	5C	1
11	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-182	F22V	K31835	...	...	5C	1
12	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-336	F22V	K31835	...	...	5C	1
13	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-541	22V	K31835	...	...	5C	1
14	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-542	D	K31835	4a	...	5C	1
15	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-832	22V	K31835	...	...	5C	1
16	3Cr-1Mo	Smls. tube	SA-213	T21	K31545	...	...	5A	1
17	3Cr-1Mo	Smls. pipe	SA-335	P21	K31545	...	...	5A	1
18	3Cr-1Mo	Forgings	SA-336	F21	K31545	1	...	5A	1
19	3Cr-1Mo	Forged pipe	SA-369	FP21	K31545	...	...	5A	1
20	3Cr-1Mo	Plate	SA-387	21	K31545	1	...	5A	1
21	3Cr-1Mo	Forgings	SA-182	F21	K31545	...	...	5A	1
22	3Cr-1Mo	Forgings	SA-336	F21	K31545	3	...	5A	1
23	3Cr-1Mo	Plate	SA-387	21	K31545	2	...	5A	1
24	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-182	F3V	K31830	...	...	5C	1
25	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-336	F3V	K31830	...	...	5C	1
26	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-508	3V	K31830	...	...	5C	1
27	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-541	3V	K31830	...	...	5C	1
28	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-542	C	K31830	4a	...	5C	1
29	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-832	21V	K31830	...	...	5C	1
30	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-182	F3VCb	K31390	...	...	5C	1
31	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-336	F3VCb	K31390	...	...	5C	1
32	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-508	3VCb	K31390	...	...	5C	1
33	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-541	3VCb	K31390	...	...	5C	1
34	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-542	E	K31390	4a	...	5C	1
35	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-832	23V	K31390	...	...	5C	1
36	5Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T5	K41545	...	...	5B	1
37	5Cr- $\frac{1}{2}$ Mo	Fittings	SA-234	WP5	K41545	...	...	5B	1
38	5Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P5	K41545	...	...	5B	1
39	5Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP5	K41545	...	...	5B	1
40	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	1	...	5B	1
41	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5	K41545	...	...	5B	1
42	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5	K41545	...	...	5B	1
43	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	2	...	5B	1
44	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5A	K42544	...	...	5B	1
45	5Cr- $\frac{1}{2}$ Mo	Castings	SA-217	C5	J42045	NT	...	5B	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	70	40	1200	CS-2	T7, W5
2	75	45	1200	CS-3	T5, W5
3	75	45	1200	CS-3	T5, W5
4	75	45	1200	CS-3	T5, W5
5	75	45	1200	CS-3	T5, W5
6	75.5	45	1200	CS-3	T5, W5
7	85	55	1000	CS-3	T5, W5
8	85	55	850	CS-2	G12, T5
9	85	55	850	CS-2	G12, T5
10	85	55	850	CS-2	G12, T5
11	85	60	900	CS-2	G12, T5
12	85	60	900	CS-2	G12, T5
13	85	60	900	CS-2	G12, T5
14	85	60	900	CS-2	G12, T5
15	85	60	900	CS-2	G12, T5
16	60	30	1200	CS-2	T5
17	60	30	1200	CS-2	T5
18	60	30	1200	CS-2	T5
19	60	30	1200	CS-2	T5
20	60	30	1200	CS-2	T5
21	75	45	1200	CS-3	T6
22	75	45	1200	CS-3	T6
23	75	45	1200	CS-3	T6
24	85	60	900	CS-3	G12, T4
25	85	60	900	CS-3	G12, T4
26	85	60	900	CS-3	G12, T4
27	85	60	900	CS-3	G12, T4
28	85	60	900	CS-3	G12, T4
29	85	60	900	CS-3	G12, T4
30	85	60	900	CS-3	G12, T4
31	85	60	900	CS-3	G12, T4
32	85	60	900	CS-3	G12, T4
33	85	60	900	CS-3	G12, T4
34	85	60	900	CS-3	G12, T4
35	85	60	900	CS-3	G12, T4
36	60	30	1200	CS-2	T5
37	60	30	1200	CS-2	T5
38	60	30	1200	CS-2	T5
39	60	30	1200	CS-2	T5
40	60	30	1200	CS-2	T5
41	60	36	1200	CS-2	T5
42	70	40	1200	CS-2	T5
43	75	45	1200	CS-3	T5
44	80	50	1200	CS-3	T5
45	90	60	1200	CS-3	T5

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	26.7	25.3	24.7	24.2	23.9	23.6	23.4	23.2	23.0	22.7	22.5	22.2	21.9	21.6	21.2	20.7	16.0
2	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	21.9	17.0
3	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	21.9	17.0
4	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	21.9	17.0
5	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	21.9	17.0
6	30.0	28.3	27.5	26.8	26.2	25.8	25.4	...	24.8	24.6	24.4	24.1	23.8	23.4	22.9	21.9	15.8
7	35.4	34.7	33.9	33.3	32.8	32.4	32.1	31.9	31.6	31.3	31.0	30.6	30.2	29.7	29.2	21.9	15.8
8	35.4	34.7	33.9	33.3	32.8	32.4	32.1	31.9	31.6	31.3	31.0	30.6	30.2	29.7	29.2	21.9	...
9	35.4	34.7	33.9	33.3	32.8	32.4	32.1	31.9	31.6	31.3	31.0	30.6	30.2	29.7	29.2	21.9	...
10	35.4	34.7	33.9	33.3	32.8	32.4	32.1	31.9	31.6	31.3	31.0	30.6	30.2	29.7	29.2	21.9	...
11	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.9	34.2	33.4	28.9	23.8
12	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.9	34.2	33.4	28.9	23.8
13	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.9	34.2	33.4	28.9	23.8
14	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.9	34.2	33.4	28.9	23.8
15	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.9	34.2	33.4	28.9	23.8
16	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	16.0	12.0
17	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	16.0	12.0
18	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	16.0	12.0
19	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	16.0	12.0
20	20.0	19.1	18.7	18.4	18.2	18.0	18.0	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.7	16.0	12.0
21	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	19.0	13.1
22	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	19.0	13.1
23	30.0	28.3	27.5	26.8	26.2	25.8	25.4	25.1	24.8	24.6	24.3	24.0	23.7	23.3	22.9	19.0	13.1
24	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
25	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
26	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
27	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
28	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
29	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
30	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
31	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
32	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
33	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
34	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
35	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.1	33.3	31.2	25.8	21.0
36	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
37	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
38	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
39	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
40	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
41	24.0	22.4	21.7	21.2	20.9	20.7	20.6	20.5	20.5	20.4	20.2	19.9	19.6	19.1	18.5	14.3	10.9
42	26.7	24.9	24.1	23.6	23.2	23.0	22.9	22.8	22.7	22.6	22.4	22.1	21.7	21.2	20.5	14.3	10.9
43	30.0	28.0	27.1	26.5	26.1	25.9	25.8	25.7	25.6	25.4	25.2	24.9	24.5	23.9	23.1	14.3	10.9
44	33.3	31.1	30.1	29.5	29.0	28.8	28.6	28.5	28.4	28.3	28.0	27.7	27.2	26.5	25.7	14.3	10.9
45	37.5	37.3	36.2	35.4	34.8	34.5	34.4	34.2	34.1	33.9	33.6	33.2	32.6	31.8	30.8	14.3	10.9

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
2	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
3	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
4	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
5	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
6	11.4	7.8	5.1	3.2	2.0	1.2	...	...	...	...	...	...
7	11.4	7.8	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...
16	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...
17	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...
18	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...
19	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...
20	9.0	7.0	5.5	4.0	2.7	1.5	...	...	...	...	...	...
21	9.5	6.8	4.9	3.2	2.4	1.3	...	...	...	...	...	...
22	9.5	6.8	4.9	3.2	2.4	1.3	...	...	...	...	...	...
23	9.5	6.8	4.9	3.2	2.4	1.3	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...
36	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
37	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
38	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
39	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
40	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
41	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
42	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
43	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
44	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
45	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5a	K42544	...	...	5B	1
2	5Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T5b	K51545	...	...	5B	1
3	5Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P5b	K51545	...	...	5B	1
4	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. tube	SA-213	T5c	K41245	...	...	5B	1
5	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. pipe	SA-335	P5c	K41245	...	...	5B	1
6	9Cr-1Mo	Smls. tube	SA-213	T9	K90941	...	...	5B	1
7	9Cr-1Mo	Fittings	SA-234	WP9	K90941	...	...	5B	1
8	9Cr-1Mo	Smls. pipe	SA-335	P9	K90941	...	...	5B	1
9	9Cr-1Mo	Forged pipe	SA-369	FP9	K90941	...	...	5B	1
10	9Cr-1Mo	Forgings	SA-182	F9	K90941	...	...	5B	1
11	9Cr-1Mo	Forgings	SA-336	F9	K90941	...	...	5B	1
12	9Cr-1Mo	Castings	SA-217	C12	J82090	NT	...	5B	1
13	9Cr-1Mo-V	Smls. tube	SA-213	T91 Type 1	K90901	...	...	15E	1
14	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Type 1	K90901	...	...	15E	1
15	9Cr-1Mo-V	Plate	SA-387	91 Type 1	K90901	2	...	15E	1
16	9Cr-1Mo-V	Forgings	SA-182	F91 Type 1	K90901	...	...	15E	1
17	9Cr-1Mo-V	Forgings	SA-336	F91 Type 1	K90901	...	...	15E	1
18	12Cr-Al	Plate	SA-240	405	S40500	...	...	7	1
19	12Cr-Al	Smls. tube	SA-268	TP405	S40500	...	...	7	1
20	13Cr	Plate	SA-240	410S	S41008	...	...	7	1
21	13Cr	Smls. tube	SA-268	TP410	S41000	...	...	6	1
22	13Cr	Plate	SA-240	410	S41000	...	...	6	1
23	13Cr	Forgings	SA-182	F6a	S41000	1	...	6	3
24	13Cr	Forgings	SA-182	F6a	S41000	2	...	6	3
25	13Cr	Forgings	SA-336	F6	S41000	...	...	6	3
26	13Cr	Castings	SA-217	CA15	J91150	...	...	6	3
27	15Cr	Smls. tube	SA-268	TP429	S42900	...	...	6	2
28	15Cr	Plate	SA-240	429	S42900	...	...	6	2
29	17Cr	Smls. tube	SA-268	TP430	S43000	...	...	7	2
30	17Cr	Plate	SA-240	430	S43000	...	...	7	2
31	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1100	...	...	...
32	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1100	...	...	...
33	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1100	...	...	...
34	26Cr-3Ni-3Mo	Plate	SA-240	26-3-3	S44660	...	$t \leq \frac{2}{10}$	10K	1
35	26Cr-3Ni-3Mo	Smls. tube	SA-268	26-3-3	S44660	...	$t \leq \frac{2}{10}$	10K	1
36	26Cr-3Ni-3Mo	Wld. tube	SA-268	26-3-3	S44660	...	$t \leq \frac{2}{10}$	10K	1
37	26Cr-3Ni-3Mo	Wld. tube	SA-803	26-3-3	S44660	...	$t \leq \frac{2}{10}$	10K	1
38	29Cr-4Mo-Ti	Smls. tube	SA-268	...	S44735	...	...	10J	1
39	Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	QT	...	11A	4
40	Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	...	...	11A	4
41	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	A	K12021	...	...	3	2
42	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	B	K12022	...	...	3	3
43	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	1	...	3	3
44	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	2	...	3	3
45	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	2	...	3	3

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	90	65	1200	CS-5	T5
2	60	30	1200	CS-2	T5
3	60	30	1200	CS-2	T5
4	60	30	1200	CS-2	T5
5	60	30	1200	CS-2	T5
6	60	30	1200	CS-2	T7
7	60	30	1200	CS-2	T7
8	60	30	1200	CS-2	T7
9	60	30	1200	CS-2	T7
10	85	55	1200	CS-3	T6
11	85	55	1200	CS-3	T6
12	90	60	1200	CS-3	T6
13	85	60	1200	CS-3	T7
14	85	60	1200	CS-3	T7
15	85	60	1200	CS-3	T7
16	90	60	1200	CS-3	T7
17	90	60	1200	CS-3	T7
18	60	25	1000	CS-1	G8, T7
19	60	30	1000	CS-2	G8, T7
20	60	30	1200	CS-2	T6
21	60	30	1200	CS-2	T6
22	65	30	1200	CS-2	T6
23	70	40	1200	CS-3	T4
24	85	55	1200	CS-3	T4
25	85	55	1200	CS-3	T4
26	90	65	1200	CS-5	T4
27	60	35	1200	CS-2	G8, T5
28	65	30	1200	CS-2	G8, T6
29	60	35	1200	CS-2	G8, T5
30	65	30	1200	CS-2	G8, T6
31	140	115	600	HT-1	G8, W1
32	140	115	600	HT-1	G8, W1
33	140	115	600	HT-1	G8, W1
34	85	65	700	HA-5	G8, H3
35	85	65	700	HA-5	G8, H3
36	85	65	700	HA-5	G6, G8, H3
37	85	65	600	HA-5	G6, G8, H3
38	75	60	800	HA-6	G8
39	105	65	650	CS-5	G9, T1, W2, W6
40	105	65	650	CS-5	G9, H2, W2, W6
41	75	45	1000	CS-3	G14, T5
42	80	50	1000	CS-3	G14, T5
43	80	50	1000	CS-5	T5
44	90	70	800	CS-5	...
45	90	70	800	CS-5	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	37.5	37.5	37.5	37.5	37.5	37.4	37.2	37.1	36.9	36.7	36.4	36.0	35.3	34.5	33.4	14.3	10.9
2	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
3	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
4	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
5	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.3	10.9
6	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.8	14.1
7	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.8	14.1
8	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.8	14.1
9	20.0	18.7	18.1	17.7	17.4	17.3	17.2	17.1	17.1	17.0	16.8	16.6	16.3	15.9	15.4	14.8	14.1
10	35.4	34.2	33.1	32.4	31.9	31.7	31.5	31.4	31.3	31.1	30.8	30.4	29.9	29.2	28.2	27.1	16.4
11	35.4	34.2	33.1	32.4	31.9	31.7	31.5	31.4	31.3	31.1	30.8	30.4	29.9	29.2	28.2	27.1	16.4
12	37.5	37.3	36.2	35.4	34.8	34.5	34.4	34.2	34.1	33.9	33.6	33.2	32.6	31.8	30.8	29.6	16.4
13	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.7	33.6	32.3	30.8
14	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.7	33.6	32.3	30.8
15	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	34.7	33.6	32.3	30.8
16	37.5	37.5	37.3	36.8	36.5	36.5	36.5	36.5	36.5	36.5	36.3	36.0	35.4	34.7	33.6	32.3	30.8
17	37.5	37.5	37.3	36.8	36.5	36.5	36.5	36.5	36.5	36.5	36.3	36.0	35.4	34.7	33.6	32.3	30.8
18	16.7	15.8	15.3	15.0	14.8	14.6	14.5	14.4	14.3	14.2	14.0	13.8	13.5	13.1	12.6	12.0	11.3
19	20.0	18.9	18.4	18.0	17.8	17.6	17.4	17.3	17.2	17.0	16.8	16.6	16.2	15.7	15.1	14.4	13.5
20	20.0	18.9	18.4	18.0	17.8	17.6	17.4	17.3	17.2	17.0	16.8	16.6	16.2	15.7	15.1	14.4	12.3
21	20.0	18.9	18.4	18.0	17.8	17.6	17.4	17.3	17.2	17.0	16.8	16.6	16.2	15.7	15.1	14.4	12.3
22	20.0	18.9	18.4	18.0	17.8	17.6	17.4	17.3	17.2	17.0	16.8	16.6	16.2	15.7	15.1	14.4	12.3
23	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	24.0	17.2	12.3
24	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	24.0	17.2	12.3
25	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	24.0	17.2	12.3
26	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	24.0	17.2	12.3
27	23.3	22.1	21.5	21.0	20.7	20.5	20.3	20.2	20.1	19.9	19.6	19.3	18.9	18.3	17.6	15.7	12.0
28	20.0	18.9	18.4	18.0	17.8	17.6	17.4	17.3	17.2	17.0	16.8	16.6	16.2	15.7	15.1	14.4	12.0
29	23.3	22.1	21.5	21.0	20.7	20.5	20.3	20.2	20.1	19.9	19.6	19.3	18.9	18.3	17.6	15.7	12.0
30	20.0	18.9	18.4	18.0	17.8	17.6	17.4	17.3	17.2	17.0	16.8	16.6	16.2	15.7	15.1	14.4	12.0
31	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	...	...	...	...	...	...
32	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	...	...	...	...	...	...
33	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	...	...	...	...	...	...
34	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.2	33.8	33.4	33.2	33.0	32.8	...	...	...	...
35	35.4	35.4	35.4	35.4	35.4	35.4	34.8	34.2	33.8	33.4	33.2	33.0	32.8	...	...	...	...
36	30.1	30.1	30.1	30.1	30.1	30.1	29.6	29.1	28.7	28.4	28.2	28.0	27.9	...	...	...	...
37	30.1	30.1	30.1	30.1	30.1	30.1	29.6	29.1	28.7	28.4	28.2	...	...	...	...	...	...
38	31.3	31.3	31.3	31.3	29.6	28.1	26.8	25.7	24.9	24.3	23.9	23.7	23.6	23.3	22.7	...	...
39	43.3	41.8	41.2	40.4	39.4	38.2	36.9	35.7	34.7	33.9	33.5	24.4	...	...	...	...	...
40	43.3	41.6	40.8	40.0	39.4	38.8	38.3	37.9	37.4	36.9	36.5	35.9	...	...	...	...	...
41	30.0	28.8	28.2	27.7	27.3	26.9	26.5	26.2	25.9	25.6	25.2	24.9	24.4	23.9	23.2	20.0	13.7
42	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	20.0	13.7
43	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	20.0	13.7
44	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.2	36.0	...	...
45	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.2	36.0	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
2	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
3	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
4	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
5	8.0	5.8	4.2	2.9	1.8	1.0	...	...	...	...	...	...
6	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
7	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
8	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
9	10.6	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
10	11.0	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
11	11.0	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
12	11.0	7.4	5.0	3.3	2.2	1.5	...	...	...	...	...	...
13	25.9	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...
14	25.9	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...
15	25.9	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...
16	25.9	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...
17	25.9	16.1	12.2	8.7	5.7	3.5	...	...	...	...	...	...
18	8.4	4.0	...	...	...	...	...	...	...	...	...	...
19	8.4	4.0	...	...	...	...	...	...	...	...	...	...
20	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
21	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
22	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
23	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
24	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
25	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
26	8.8	6.4	4.4	2.9	1.8	1.0	...	...	...	...	...	...
27	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...
28	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...
29	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...
30	9.2	6.5	4.5	3.2	2.4	1.8	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...
41	8.2	4.8	...	...	...	...	...	...	...	...	...	...
42	8.2	4.8	...	...	...	...	...	...	...	...	...	...
43	8.2	4.8	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	3	...	11A	4
2	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-302	C	K12039	...	...	3	3
3	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	1	...	3	3
4	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	2	...	3	3
5	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	3	...	11A	4
6	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-302	D	K12054	...	...	3	3
7	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	1	...	3	3
8	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	1	...	3	3
9	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	2	...	3	3
10	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	2	...	3	3
11	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	B	K12554	3	...	3	3
12	Mn- $\frac{1}{2}$ Ni-V	Plate	SA-225	C	K12524	...	...	10A	1
13	Mn-V	Castings	SA-487	1	J13002	A/NT	...	10A	1
14	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	A/NT	...	3	3
15	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	1	...	3	3
16	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	2	...	3	3
17	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...	$2\frac{1}{2} < t \leq 4$	11B	3
18	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Plate	SA-517	F	K11576	...	$t \leq 2\frac{1}{2}$	11B	3
19	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...	$t \leq 2\frac{1}{2}$	11B	3
20	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cu-Mo	Smls. tube	SA-423	2	K11540	...	...	4	2
21	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	1	...	3	3
22	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	1	...	3	3
23	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	2	...	3	3
24	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	2	...	3	3
25	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042	1	...	3	3
26	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042	2	...	3	3
27	$\frac{3}{4}$ Ni-1Mo- $\frac{3}{4}$ Cr	Castings	SA-217	WC5	J22000	...	...	4	1
28	1Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC4	J12082	...	...	4	1
29	$1\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650	...	$2\frac{1}{2} < t \leq 4$	11B	8
30	$1\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650	...	$t \leq 2\frac{1}{2}$	11B	8
31	2Ni-1Cu	Forgings	SA-182	FR	K22035	...	...	9A	1
32	2Ni-1Cu	Smls. pipe	SA-333	9	K22035	...	...	9A	1
33	2Ni-1Cu	Smls. pipe	SA-334	9	K22035	...	...	9A	1
34	2Ni-1Cu	Forgings	SA-350	LF9	K22036	...	...	9A	1
35	2Ni-1Cu	Fittings	SA-420	WPL9	K22035	...	...	9A	1
36	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	1	...	11B	10
37	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	2	...	11B	10
38	$2\frac{1}{2}$ Ni	Plate	SA-203	A	K21703	...	...	9A	1
39	$2\frac{1}{2}$ Ni	Plate	SA-203	B	K22103	...	...	9A	1
40	$2\frac{1}{2}$ Ni	Castings	SA-352	LC2	J22500	...	...	9A	1
41	$2\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	K34035	3	...	3	3
42	$2\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	K34035	1	...	11A	5
43	$2\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	K34035	2	...	11B	10
44	$2\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	1	...	11B	10
45	$2\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	2	...	11B	10

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	100	83	750	CS-5	...
2	80	50	1000	CS-3	G14, T5
3	80	50	800	CS-5	...
4	90	70	800	CS-5	...
5	100	83	800	CS-5	...
6	80	50	1000	CS-3	G14, T5
7	80	50	800	CS-5	...
8	80	50	800	CS-5	...
9	90	70	800	CS-5	...
10	90	70	800	CS-5	...
11	100	83	800	CS-5	...
12	105	70	700	CS-5	T1
13	85	55	650	CS-3	T1
14	90	60	650	CS-3	...
15	80	50	800	CS-5	...
16	90	65	700	CS-5	...
17	105	90	650	CS-5	S1
18	115	100	650	HT-1	...
19	115	100	650	HT-1	...
20	60	37	650	CS-2	...
21	80	50	800	CS-5	...
22	80	50	800	CS-5	...
23	90	65	700	CS-5	...
24	90	65	700	CS-5	...
25	80	50	800	CS-5	...
26	90	65	700	CS-5	...
27	70	40	1100	CS-2	T6
28	70	40	1000	CS-2	T6
29	105	90	650	CS-5	...
30	115	100	650	HT-1	...
31	63	46	100	CS-3	...
32	63	46	100	CS-3	...
33	63	46	100	CS-3	...
34	63	46	100	CS-3	...
35	63	46	100	CS-3	...
36	115	100	650	HT-1	G10, G11, W1
37	135	120	650	HT-1	G11, W1
38	65	37	1000	CS-2	T3
39	70	40	1000	CS-2	T2
40	70	40	650	CS-2	...
41	90	70	650	CS-5	...
42	105	85	650	CS-5	...
43	115	100	650	HT-1	...
44	115	100	650	HT-1	G10, G11, W1
45	135	120	650	HT-1	G11, W1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	...	...	...
2	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	20.0	13.7
3	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	...	...
4	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.2	36.0	...	...
5	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	...	...
6	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	20.0	13.7
7	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	...	...
8	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	...	...
9	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.2	36.0	...	...
10	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.2	36.0	...	...
11	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	...	...
12	43.8	43.3	42.5	42.1	41.6	40.9	39.9	38.6	37.3	36.0	34.9	24.4	19.6	...	...	...	...
13	35.4	35.2	34.5	33.9	33.3	32.9	32.4	32.0	31.6	31.3	30.9	24.4	...	...	...	...	...
14	37.5	37.5	37.5	37.0	36.3	35.8	35.5	35.2	34.6	33.7	32.4	31.0	...	...	...	...	...
15	33.3	32.6	31.7	30.8	30.2	29.9	29.6	29.3	28.9	28.1	27.0	25.8	24.9	24.9	24.9	...	...
16	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	36.5	35.1	33.6	32.3	...	...	...	...
17	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
18	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
19	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
20	24.7	23.3	22.7	22.3	22.0	21.8	21.5	21.3	21.1	20.9	20.6	20.3	...	...	...	...	...
21	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	...	...
22	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	...	...
23	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.4	36.9	36.5	35.9	35.3	...	...	...	...
24	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.4	36.9	36.5	35.9	35.3	...	...	...	...
25	33.3	32.0	31.4	30.8	30.3	29.9	29.5	29.1	28.8	28.4	28.0	27.6	27.1	26.5	25.7	...	...
26	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.4	36.9	36.5	35.9	35.3	...	...	...	...
27	26.7	25.6	25.1	24.6	24.3	23.9	23.6	23.3	23.0	22.7	22.4	22.1	21.7	21.2	20.6	19.8	16.3
28	26.7	25.6	25.1	24.6	24.3	23.9	23.6	23.3	23.0	22.7	22.4	22.1	21.7	21.2	20.6	19.8	15.0
29	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
30	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
31	26.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	26.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	26.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	26.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	26.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
37	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	...	...	...	...	...
38	24.7	23.2	22.6	22.2	21.8	21.5	21.1	20.6	20.0	19.3	18.5	17.6	16.6	13.9	11.4	9.0	6.5
39	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.6	20.9	20.0	19.0	16.9	13.9	11.4	9.0	6.5
40	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.6	20.9	20.0	19.0	...	...	...	...	...
41	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	...	...	...	...	...
42	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
43	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
44	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
45	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	...	...	...	...	...	...	...	...	...	...	...	...
2	8.2	4.8	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...
6	8.2	4.8	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	11.0	6.9	4.6	2.8	...	...	...	...	...	...	...	...
28	9.2	5.9	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...
38	4.5	2.5	...	...	...	...	...	...	...	...	...	...
39	4.5	2.5	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	3	...	3	3
2	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	1	...	11A	5
3	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	2	...	11B	10
4	3 $\frac{1}{2}$ Ni	Smls. pipe	SA-333	3	K31918	...	...	9B	1
5	3 $\frac{1}{2}$ Ni	Smls. tube	SA-334	3	K31918	...	...	9B	1
6	3 $\frac{1}{2}$ Ni	Fittings	SA-420	WPL3	...	...	...	9B	1
7	3 $\frac{1}{2}$ Ni	Plate	SA-203	D	K31718	...	...	9B	1
8	3 $\frac{1}{2}$ Ni	Forgings	SA-350	LF3	K32025	...	...	9B	1
9	3 $\frac{1}{2}$ Ni	Forgings	SA-765	III	K32026	...	...	9B	1
10	3 $\frac{1}{2}$ Ni	Plate	SA-203	E	K32018	...	...	9B	1
11	3 $\frac{1}{2}$ Ni	Castings	SA-352	LC3	J31550	...	...	9B	1
12	3 $\frac{1}{2}$ Ni	Plate	SA-203	F	...	...	$t > 2$	9B	1
13	3 $\frac{1}{2}$ Ni	Plate	SA-203	F	...	...	$t \leq 2$	9B	1
14	3 $\frac{1}{2}$ Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-508	4N	K22375	3	...	3	3
15	3 $\frac{1}{2}$ Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-508	4N	K22375	1	...	11A	5
16	3 $\frac{1}{2}$ Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-508	4N	K22375	2	...	11B	10
17	4Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	3	K44045	1	...	11B	10
18	4Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	3	K44045	2	...	11B	10
19	5Ni- $\frac{1}{4}$ Mo	Plate	SA-645	A	K41583	...	...	11A	2
20	7Ni	Plate	SA-553	III	K61365	...	$t \leq 2$	11A	1
21	7Ni	Plate	SA-553	III	K61365	...	$t \leq 2$	11A	1
22	8Ni	Plate	SA-553	II	K71340	...	...	11A	1
23	8Ni	Plate	SA-553	II	K71340	...	...	11A	1
24	9Ni	Smls. pipe	SA-333	8	K81340	...	...	11A	1
25	9Ni	Smls. pipe	SA-333	8	K81340	...	...	11A	1
26	9Ni	Smls. tube	SA-334	8	K81340	...	...	11A	1
27	9Ni	Smls. tube	SA-334	8	K81340	...	...	11A	1
28	9Ni	Plate	SA-353	...	K81340	...	...	11A	1
29	9Ni	Plate	SA-353	...	K81340	...	...	11A	1
30	9Ni	Fittings	SA-420	WPL8	K81340	...	...	11A	1
31	9Ni	Fittings	SA-420	WPL8	K81340	...	...	11A	1
32	9Ni	Forgings	SA-522	I	K81340	...	...	11A	1
33	9Ni	Forgings	SA-522	I	K81340	...	...	11A	1
34	9Ni	Plate	SA-553	I	K81340	...	...	11A	1
35	9Ni	Plate	SA-553	I	K81340	...	...	11A	1
36	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	8	3
37	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	8	3
38	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	$t > 5$	8	1
39	16Cr-12Ni-2Mo	Forgings	SA-965	F316L	S31603	...	...	8	1
40	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	$t \leq 5$	8	1
41	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...	...	8	1
42	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...	...	8	1
43	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	...	8	1
44	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316L	S31603	...	...	8	1
45	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	...	...	8	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	90	70	650	CS-5	...
2	105	85	650	CS-5	W7
3	115	100	650	HT-1	...
4	65	35	650	CS-2	...
5	65	35	650	CS-2	...
6	65	35	650	CS-2	...
7	65	37	1000	CS-2	T3
8	70	37.5	650	CS-2	...
9	70	37.5	650	CS-2	...
10	70	40	1000	CS-2	T3
11	70	40	650	CS-2	...
12	75	50	650	CS-3	T1
13	80	55	650	CS-3	...
14	90	70	650	CS-5	...
15	105	85	650	CS-5	W7
16	115	100	650	HT-1	...
17	115	100	650	HT-1	G10, G11, W1
18	135	120	650	HT-1	G11, W1
19	95	65	250	CS-3	W4
20	100	85	150	CS-3	W3
21	100	85	150	CS-3	W4
22	100	85	250	CS-3	W3
23	100	85	250	CS-3	W4
24	100	75	250	CS-3	W3
25	100	75	250	CS-3	W4
26	100	75	250	CS-3	W3
27	100	75	250	CS-3	W4
28	100	75	250	CS-3	W3
29	100	75	250	CS-3	W4
30	100	75	250	CS-3	W3
31	100	75	250	CS-3	W4
32	100	75	250	CS-3	G9, S2, W3
33	100	75	250	CS-3	G9, S2, W4
34	100	85	250	CS-3	W3
35	100	85	250	CS-3	W4
36	95	45	800	HA-6	...
37	95	45	800	HA-6	G2
38	65	25	850	HA-4	G2
39	65	25	850	HA-4	G2
40	70	25	850	HA-4	G2
41	70	25	850	HA-4	G2
42	70	25	850	HA-4	G2
43	70	25	850	HA-4	G2, G6
44	70	25	850	HA-4	G2
45	70	25	850	HA-4	G2, G6

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	...	...	...	...	...
2	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
3	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
4	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	18.9	18.3	17.5	16.7	...	...	...	...	...
5	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	18.9	18.3	17.5	16.7	...	...	...	...	...
6	23.3	21.9	21.4	21.0	20.6	20.3	19.9	19.5	18.9	18.3	17.5	16.7	...	...	...	...	...
7	24.7	23.2	22.6	22.2	21.8	21.5	21.1	20.6	20.0	19.3	18.5	17.6	16.6	13.9	11.4	9.0	6.5
8	25.0	23.5	22.9	22.5	22.1	21.8	21.4	20.9	20.3	19.6	18.8	17.9	...	...	...	...	...
9	25.0	23.5	22.9	22.5	22.1	21.8	21.4	20.9	20.3	19.6	18.8	17.9	...	...	...	...	...
10	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.6	20.9	20.0	19.0	18.0	14.8	12.0	9.3	6.5
11	26.7	25.1	24.4	24.0	23.6	23.2	22.8	22.3	21.6	20.9	20.0	19.0	...	...	...	...	...
12	31.3	31.3	30.5	29.9	29.5	29.0	28.5	27.8	27.1	26.1	25.0	22.5	...	...	...	...	...
13	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	...	...	...	...	...
14	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	...	...	...	...	...
15	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	43.8	...	...	...	...	...
16	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
17	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	...	...	...	...	...
18	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	...	...	...	...	...
19	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
20	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
23	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
24	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
25	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
26	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
27	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
28	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
29	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
30	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
31	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
32	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
33	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
34	41.7	41.7	41.7	41.7	...	...	...	...	...	...	...	...	...	...	...	...	...
35	39.6	39.6	39.6	39.6	...	...	...	...	...	...	...	...	...	...	...	...	...
36	30.0	...	24.2	...	21.9	...	20.7	...	20.0	...	19.1	18.6	18.0	17.3	16.7	...	...
37	30.0	...	30.0	...	29.6	...	28.0	...	27.0	...	25.8	25.1	24.3	23.4	22.6	...	...
38	16.7	16.7	16.7	16.7	16.7	16.4	15.7	15.2	14.8	14.4	14.0	13.7	13.5	13.2	12.9	12.7	...
39	16.7	16.7	16.7	16.7	16.7	16.4	15.7	15.2	14.8	14.4	14.0	13.7	13.5	13.2	12.9	12.7	...
40	16.7	16.7	16.7	16.7	16.7	16.4	15.7	15.2	14.8	14.4	14.0	13.7	13.5	13.2	12.9	12.7	...
41	16.7	16.7	16.7	16.7	16.7	16.4	15.7	15.2	14.8	14.4	14.0	13.7	13.5	13.2	12.9	12.7	...
42	16.7	16.7	16.7	16.7	16.7	16.4	15.7	15.2	14.8	14.4	14.0	13.7	13.5	13.2	12.9	12.7	...
43	14.2	14.2	14.2	14.2	14.2	13.9	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.2	11.0	10.8	...
44	16.7	16.7	16.7	16.7	16.7	16.4	15.7	15.2	14.8	14.4	14.0	13.7	13.5	13.2	12.9	12.7	...
45	14.2	14.2	14.2	14.2	14.2	13.9	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.2	11.0	10.8	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...
7	4.5	2.5	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...
10	4.5	2.5	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	16Cr-12Ni-2Mo	Fittings	SA-403	316L	S31603	CR	...	8	1
2	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316L	S31603	WP-W	...	8	1
3	16Cr-12Ni-2Mo	Wld. fittings	SA-403	316L	S31603	WP-WX	...	8	1
4	16Cr-12Ni-2Mo	Wld. pipe	SA-688	TP316L	S31603	...	...	8	1
5	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	$t > 5$	8	1
6	16Cr-12Ni-2Mo	Forgings	SA-965	F316	S31600	...	...	8	1
7	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	$t > 5$	8	1
8	16Cr-12Ni-2Mo	Forgings	SA-965	F316H	S31609	...	...	8	1
9	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	$t \leq 5$	8	1
10	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
11	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...	...	8	1
12	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
13	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316	S31600	...	...	8	1
14	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
15	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	8	1
16	16Cr-12Ni-2Mo	Fittings	SA-403	316	S31600	WP-S	...	8	1
17	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	8	1
18	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	$t \leq 5$	8	1
19	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316H	S31609	...	...	8	1
20	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	8	1
21	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316H	S31609	...	...	8	1
22	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316H	S31609	...	...	8	1
23	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316H	S31609	...	...	8	1
24	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X2CrNiMo17-12-2	...	...	≤ 3	8	1
25	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X5CrNiMo17-12-2	...	...	≤ 3	8	1
26	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316N	S31651	...	$t \leq 5$	8	1
27	16Cr-12Ni-2Mo-N	Plate	SA-240	316N	S31651	...	$t \leq 5$	8	1
28	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651	...	...	8	1
29	16Cr-12Ni-2Mo-N	Smls. pipe	SA-312	TP316N	S31651	...	$t \leq 5$	8	1
30	16Cr-12Ni-2Mo-N	Wld. pipe	SA-312	TP316N	S31651	...	$t \leq 5$	8	1
31	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316N	S31651	...	...	8	1
32	16Cr-12Ni-2Mo-N	Fittings	SA-403	316N	S31651	CR	...	8	1
33	16Cr-12Ni-2Mo-N	Wld. fittings	SA-403	316N	S31651	WP-W	...	8	1
34	16Cr-12Ni-2Mo-N	Wld. fittings	SA-403	316N	S31651	WP-WX	...	8	1
35	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316N	S31651	...	...	8	1
36	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-11-2	...	...	≤ 3	8	1
37	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-13-3	...	...	≤ 3	8	1
38	17.5Cr-17.5Ni-5.3Si	Plate	SA-240	...	S30601	...	...	8	1
39	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000	...	$t > \frac{3}{16}$	8	3
40	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000	...	$t \leq \frac{3}{16}$	8	3
41	18Cr-5Ni-3Mo	Smls. tube	SA-789	...	S31500	...	...	10H	1
42	18Cr-5Ni-3Mo	Wld. tube	SA-789	...	S31500	...	...	10H	1
43	18Cr-5Ni-3Mo	Smls. pipe	SA-790	...	S31500	...	...	10H	1
44	18Cr-5Ni-3Mo	Wld. pipe	SA-790	...	S31500	...	...	10H	1
45	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	$t > 5$	8	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	70	25	850	HA-4	G2, G6
2	70	25	850	HA-4	G2, G6
3	70	25	850	HA-4	G2, G6
4	70	25	850	HA-4	G2, G6
5	70	30	1500	HA-2	G2, T10
6	70	30	1500	HA-2	G2, G3, G4, T10
7	70	30	1500	HA-2	G2, T10
8	70	30	1500	HA-2	G2, T10
9	75	30	1500	HA-2	G2, G3, T10
10	75	30	1500	HA-2	G2, G3, T10
11	75	30	1500	HA-2	G2, G3, G4, T10
12	75	30	1500	HA-2	G2, G3, G6, T10
13	75	30	1500	HA-2	G2, G3, G4, T10
14	75	30	1500	HA-2	G2, G3, G4, G6, T10
15	75	30	1500	HA-2	G2, G3, G4, T10
16	75	30	1500	HA-2	G2, T10
17	75	30	1500	HA-2	G2, G3, G6, T10
18	75	30	1500	HA-2	G2, T10
19	75	30	1500	HA-2	G2, T10
20	75	30	1500	HA-2	G2, G6, T10
21	75	30	1500	HA-2	G2, T10
22	75	30	1500	HA-2	G2, G6, T10
23	75	30	1500	HA-2	G2, G4, T10
24	75	32	850	HA-4	G2, G16
25	75	32	1022	HA-2	G2, G3, G4, G16
26	80	35	1200	HA-2	G2, T9
27	80	35	1200	HA-2	G2, T9
28	80	35	1200	HA-2	G2, G6, T9
29	80	35	1200	HA-2	G2, T9
30	80	35	1200	HA-2	G2, G6, T9
31	80	35	1200	HA-2	G2, G4, T9
32	80	35	1200	HA-2	G2, G6, T9
33	80	35	1200	HA-2	G2, G6, T9
34	80	35	1200	HA-2	G2, G6, T9
35	80	35	1200	HA-2	G2, T9
36	84	41	800	HA-2	G2, G16
37	84	41	800	HA-2	G2, G16
38	78	37	400	HA-1	...
39	100	55	800	HA-6	G2
40	100	60	800	HA-6	G2
41	92	64	650	HA-5	G8
42	92	64	650	HA-5	G6, G8
43	92	64	650	HA-5	G8
44	92	64	650	HA-5	G6, G8
45	65	25	1200	HA-3	G2, T9

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	14.2	14.2	14.2	14.2	14.2	13.9	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.2	11.0	10.8	...
2	14.2	14.2	14.2	14.2	14.2	13.9	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.2	11.0	10.8	...
3	14.2	14.2	14.2	14.2	14.2	13.9	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.2	11.0	10.8	...
4	14.2	14.2	14.2	14.2	14.2	13.9	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.2	11.0	10.8	...
5	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
6	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
7	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
8	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
9	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
10	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
11	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
12	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
13	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
14	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
15	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
16	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
17	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
18	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
19	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
20	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
21	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
22	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
23	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
24	21.3	21.3	21.3	21.3	21.3	20.9	20.1	19.5	18.8	18.3	17.9	17.6	17.2	16.9	16.6	16.2	...
25	21.3	21.3	21.3	21.3	21.3	21.3	20.5	19.8	19.1	18.6	18.1	17.7	17.4	17.2	16.9	16.7	16.6
26	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.0	22.3	21.6	21.0	20.5	20.0	19.6	19.2	18.8	18.5
27	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.0	22.3	21.6	21.0	20.5	20.0	19.6	19.2	18.8	18.5
28	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.5	18.9	18.4	17.9	17.4	17.0	16.7	16.3	16.0	15.7
29	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.0	22.3	21.6	21.0	20.5	20.0	19.6	19.2	18.8	18.5
30	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.5	18.9	18.4	17.9	17.4	17.0	16.7	16.3	16.0	15.7
31	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.0	22.3	21.6	21.0	20.5	20.0	19.6	19.2	18.8	18.5
32	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.5	18.9	18.4	17.9	17.4	17.0	16.7	16.3	16.0	15.7
33	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.5	18.9	18.4	17.9	17.4	17.0	16.7	16.3	16.0	15.7
34	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.5	18.9	18.4	17.9	17.4	17.0	16.7	16.3	16.0	15.7
35	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.0	22.3	21.6	21.0	20.5	20.0	19.6	19.2	18.8	18.5
36	27.1	27.1	27.1	27.1	27.1	26.7	25.6	24.6	23.7	23.0	22.3	21.7	21.1	20.6	20.1	...	...
37	27.1	27.1	27.1	27.1	27.1	26.7	25.6	24.6	23.7	23.0	22.3	21.7	21.1	20.6	20.1	...	...
38	24.7	24.7	24.7	24.7	24.4	23.2	22.2	...	...	...	...	...	...	...	...	...	...
39	36.7	36.7	36.7	36.6	33.8	31.5	29.6	28.2	27.2	26.4	25.9	25.4	25.0	24.5	24.0	...	...
40	40.0	40.0	40.0	39.9	36.8	34.3	32.3	30.8	29.6	28.8	28.2	27.7	27.3	26.8	26.2	...	...
41	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	...	...	...	...	...
42	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	...	...	...	...	...
43	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	38.3	...	...	...	...	...
44	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	...	...	...	...	...
45	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...
5	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
6	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
7	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
8	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
9	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
10	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
11	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
12	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.6	2.7	2.0	1.5	1.2
13	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
14	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.6	2.7	2.0	1.5	1.2
15	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
16	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4
17	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.6	2.7	2.0	1.5	1.2
18	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
19	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
20	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1
21	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
22	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.4	1.1
23	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
24	...	...	...	...	...	...	...	...	...	...	...	...
25	16.4	16.3	16.1	...	...	...	...	...	...	...	...	...
26	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...
27	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...
28	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...
29	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...
30	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...
31	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...
32	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...
33	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...
34	15.4	15.1	13.4	10.5	8.3	6.3	...	...	...	...	...	...
35	18.1	17.8	15.8	12.3	9.8	7.4	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...
45	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Forgings	SA-965	F304L	S30403	...	...	8	1
2	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	$t \leq 5$	8	1
3	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...	...	8	1
4	18Cr-8Ni	Plate	SA-240	304L	S30403	...	...	8	1
5	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
6	18Cr-8Ni	Smls. pipe	SA-312	TP304L	S30403	...	...	8	1
7	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	...	...	8	1
8	18Cr-8Ni	Fittings	SA-403	304L	S30403	WP-S	...	8	1
9	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	8	1
10	18Cr-8Ni	Castings	SA-351	CF3	J92500	...	...	8	1
11	18Cr-8Ni	Castings	SA-351	CF10	J92590	...	...	8	1
12	18Cr-8Ni	Castings	SA-351	CF8	J92600	...	...	8	1
13	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	$t > 5$	8	1
(23) 14	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	≥ 8	8	1
15	18Cr-8Ni	Forgings	SA-965	F304	S30400	...	...	8	1
16	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	$t > 5$	8	1
17	18Cr-8Ni	Forgings	SA-965	F304H	S30409	...	...	8	1
18	18Cr-8Ni	Plate	SA/EN 10028-7	X2CrNi18-9	...	...	≤ 3	8	1
19	18Cr-8Ni	Plate	SA-240	302	S30200	...	...	8	1
20	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	$t \leq 5$	8	1
21	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...	...	8	1
22	18Cr-8Ni	Plate	SA-240	304	S30400	...	...	8	1
23	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
24	18Cr-8Ni	Smls. pipe	SA-312	TP304	S30400	...	...	8	1
25	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	...	...	8	1
(23) 26	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	< 8	8	1
27	18Cr-8Ni	Fittings	SA-403	304	S30400	CR	...	8	1
28	18Cr-8Ni	Fittings	SA-403	304	S30400	WP-S	...	8	1
29	18Cr-8Ni	Wld. fittings	SA-403	304	S30400	WP-W	...	8	1
30	18Cr-8Ni	Wld. fittings	SA-403	304	S30400	WP-WX	...	8	1
31	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	8	1
32	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	$t \leq 5$	8	1
33	18Cr-8Ni	Smls. tube	SA-213	TP304H	S30409	...	...	8	1
34	18Cr-8Ni	Plate	SA-240	304H	S30409	...	...	8	1
35	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	8	1
36	18Cr-8Ni	Smls. pipe	SA-312	TP304H	S30409	...	...	8	1
37	18Cr-8Ni	Wld. pipe	SA-312	TP304H	S30409	...	...	8	1
38	18Cr-8Ni	Smls. pipe	SA-376	TP304H	S30409	...	...	8	1
39	18Cr-8Ni	Fittings	SA-403	304H	S30409	CR	...	8	1
40	18Cr-8Ni	Fittings	SA-403	304H	S30409	WP-S	...	8	1
41	18Cr-8Ni	Wld. fittings	SA-403	304H	S30409	WP-W	...	8	1
42	18Cr-8Ni	Wld. fittings	SA-403	304H	S30409	WP-WX	...	8	1
43	18Cr-8Ni	Plate	SA/EN 10028-7	X5CrNi18-10	...	...	≤ 3	8	1
44	18Cr-8Ni-N	Smls. tube	SA-213	TP304N	S30451	...	...	8	1
45	18Cr-8Ni-N	Plate	SA-240	304N	S30451	...	...	8	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	65	25	1200	HA-3	G2, T9
2	70	25	1200	HA-3	G2, T9
3	70	25	1200	HA-3	G2, T9
4	70	25	1200	HA-3	G2, T9
5	70	25	1200	HA-3	G2, G6, T9
6	70	25	1200	HA-3	G2, T9
7	70	25	1200	HA-3	G2, G6, T9
8	70	25	1200	HA-3	G2, T9
9	70	25	1200	HA-3	G2, G6, T9
10	70	30	800	HA-3	G2, G8
11	70	30	1500	HA-3	G2, G4, G8, T8
12	70	30	1500	HA-1	G2, G3, G4, G8, T8
13	70	30	1500	HA-1	G2, G3, G4, T9
14	70	30	1500	HA-1	G2, G3, G4, S3, T9
15	70	30	1500	HA-1	G2, G3, G4, T9
16	70	30	1500	HA-1	G2, T9
17	70	30	1500	HA-1	G2, T9
18	72.5	29	1022	HA-3	G2, G16, T9
19	75	30	750	HA-1	G2, G3
20	75	30	1500	HA-1	G2, G3, G4, T9
21	75	30	1500	HA-1	G2, G3, T9
22	75	30	1500	HA-1	G2, G3, G4, T9
23	75	30	1500	HA-1	G2, G3, G6, T9
24	75	30	1500	HA-1	G2, G3, G4, T9
25	75	30	1500	HA-1	G2, G3, G4, G6, T9
26	75	30	1500	HA-1	G2, G3, G4, S4, T9
27	75	30	1500	HA-1	G2, G6, T9
28	75	30	1500	HA-1	G2, T9
29	75	30	1500	HA-1	G2, G6, T9
30	75	30	1500	HA-1	G2, G6, T9
31	75	30	1500	HA-1	G2, G3, G6, T9
32	75	30	1500	HA-1	G2, T9
33	75	30	1500	HA-1	G2, T9
34	75	30	1500	HA-1	G2, T9
35	75	30	1500	HA-1	G2, G6, T9
36	75	30	1500	HA-1	G2, T9
37	75	30	1500	HA-1	G2, G6, T9
38	75	30	1500	HA-1	G2, G4, T9
39	75	30	1500	HA-1	G2, G6, T9
40	75	30	1500	HA-1	G2, T9
41	75	30	1500	HA-1	G2, G6, T9
42	75	30	1500	HA-1	G2, G6, T9
43	75	31	1022	HA-1	G2, G3, G4, G16, T9
44	80	35	1200	HA-1	G2, T9
45	80	35	1200	HA-1	G2, T9

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
2	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
3	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
4	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
5	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
6	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
7	14.2	14.2	14.2	14.2	14.2	14.0	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.3	11.1	10.9	10.7
8	16.7	16.7	16.7	16.7	16.7	16.5	15.8	15.2	14.7	14.3	14.0	13.7	13.5	13.3	13.0	12.8	12.6
9	14.2	14.2	14.2	14.2	14.2	14.0	13.4	12.9	12.5	12.2	11.9	11.7	11.4	11.3	11.1	10.9	10.7
10	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	...	...
11	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
12	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
13	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
14	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
15	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
16	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
17	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
18	19.3	19.3	19.3	19.3	19.3	19.1	18.3	17.7	17.1	16.6	16.2	15.9	15.6	15.4	15.2	14.9	14.6
19	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	...	...	...
20	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
21	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
22	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
23	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
24	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
25	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
26	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
27	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
28	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
29	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
30	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
31	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
32	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
33	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
34	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
35	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
36	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
37	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
38	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
39	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
40	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
41	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
42	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
43	20.3	20.3	20.3	20.3	20.3	19.6	18.9	18.3	17.7	17.2	16.8	16.4	16.1	15.7	15.4	15.1	14.8
44	23.3	23.3	23.3	23.3	22.5	21.3	20.3	19.5	18.9	18.3	17.9	17.5	17.2	16.9	16.6	16.3	16.0
45	23.3	23.3	23.3	23.3	22.5	21.3	20.3	19.5	18.9	18.3	17.9	17.5	17.2	16.9	16.6	16.3	16.0

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
2	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
3	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
4	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
5	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
6	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
7	10.5	10.2	5.4	4.3	3.4	2.7	...	...	...	...	...	...
8	12.3	12.0	6.3	5.1	4.0	3.2	...	...	...	...	...	...
9	10.5	10.2	5.4	4.3	3.4	2.7	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...
11	14.3	12.2	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7
12	14.3	12.2	9.5	7.5	6.0	4.8	3.9	3.3	2.7	2.3	2.0	1.7
13	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
14	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4 (23)
15	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
16	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
17	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
18	14.3	13.9	6.3	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
21	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
22	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
23	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
24	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
25	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
26	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4 (23)
27	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
28	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
29	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
30	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
31	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
32	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
33	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
34	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
35	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
36	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
37	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
38	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
39	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
40	14.3	14.0	12.4	9.8	7.7	6.1	4.7	3.7	2.9	2.3	1.8	1.4
41	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
42	12.1	11.9	10.5	8.3	6.6	5.2	4.0	3.1	2.5	2.0	1.6	1.2
43	14.5	14.2	12.4	...	...	...	...	...	...	...	...	...
44	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...
45	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	8	1
2	18Cr-8Ni-N	Smls. pipe	SA-312	TP304N	S30451	...	...	8	1
3	18Cr-8Ni-N	Wld. pipe	SA-312	TP304N	S30451	...	...	8	1
4	18Cr-8Ni-N	Smls. pipe	SA-376	TP304N	S30451	...	...	8	1
5	18Cr-8Ni-N	Fittings	SA-403	304N	S30451	CR	...	8	1
6	18Cr-8Ni-N	Wld. fittings	SA-403	304N	S30451	WP-W	...	8	1
7	18Cr-8Ni-N	Wld. fittings	SA-403	304N	S30451	WP-WX	...	8	1
8	18Cr-8Ni-N	Forgings	SA-965	F304N	S30451	...	...	...	...
9	18Cr-8Ni-N	Plate	SA/EN 10028-7	X2CrNiN18-10	...	...	≤3	8	1
10	18Cr-8Ni-N	Plate	SA/EN 10028-7	X5CrNiN19-9	...	...	≤3	8	1
11	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710	...	...	8	1
12	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...	t > 5	8	1
13	18Cr-10Ni-Cb	Forgings	SA-965	F347	S34700	...	...	8	1
14	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	t > 5	8	1
15	18Cr-10Ni-Cb	Forgings	SA-965	F347H	S34709	...	...	8	1
16	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	t > 5	8	1
17	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	t > 5	8	1
18	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...	t ≤ 5	8	1
19	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347	S34700	...	...	8	1
20	18Cr-10Ni-Cb	Plate	SA-240	347	S34700	...	...	8	1
21	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	8	1
22	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347	S34700	...	...	8	1
23	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347	S34700	...	...	8	1
24	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347	S34700	...	...	8	1
25	18Cr-10Ni-Cb	Fittings	SA-403	347	S34700	CR	...	8	1
26	18Cr-10Ni-Cb	Fittings	SA-403	347	S34700	WP-S	...	8	1
27	18Cr-10Ni-Cb	Wld. fittings	SA-403	347	S34700	WP-W	...	8	1
28	18Cr-10Ni-Cb	Wld. fittings	SA-403	347	S34700	WP-WX	...	8	1
29	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	t ≤ 5	8	1
30	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347H	S34709	...	...	8	1
31	18Cr-10Ni-Cb	Plate	SA-240	347H	S34709	...	...	8	1
32	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	8	1
33	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347H	S34709	...	...	8	1
34	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP347H	S34709	...	...	8	1
35	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347H	S34709	...	...	8	1
36	18Cr-10Ni-Cb	Fittings	SA-403	347H	S34709	CR	...	8	1
37	18Cr-10Ni-Cb	Fittings	SA-403	347H	S34709	WP-S	...	8	1
38	18Cr-10Ni-Cb	Wld. fittings	SA-403	347H	S34709	WP-W	...	8	1
39	18Cr-10Ni-Cb	Wld. fittings	SA-403	347H	S34709	WP-WX	...	8	1
40	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	t ≤ 5	8	1
41	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348	S34800	...	...	8	1
42	18Cr-10Ni-Cb	Plate	SA-240	348	S34800	...	...	8	1
43	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	8	1
44	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP348	S34800	...	...	8	1
45	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348	S34800	...	...	8	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	80	35	1200	HA-1	G2, G6, T9
2	80	35	1200	HA-1	G2, T9
3	80	35	1200	HA-1	G2, G6, T9
4	80	35	1200	HA-1	G2, G4, T9
5	80	35	1200	HA-1	G2, G6, T9
6	80	35	1200	HA-1	G2, G6, T9
7	80	35	1200	HA-1	G2, G6, T9
8	80	35	1200	HA-1	G2, T9
9	80	39	800	HA-1	G2, G16
10	80	39	1022	HA-1	G2, G16, T9
11	70	30	1500	HA-2	G2, G3, G8, T8
12	70	30	1500	HA-2	G2, G3, T8
13	70	30	1500	HA-2	G2, G3, G4, T8
14	70	30	1500	HA-2	G1, G2, T9
15	70	30	1500	HA-2	G1, G2, G3, T9
16	70	30	1500	HA-2	G2, G3, T8
17	70	30	1500	HA-2	G2, T9
18	75	30	1500	HA-2	G2, G3, G4, T8
19	75	30	1500	HA-2	G2, G3, G4, T8
20	75	30	1500	HA-2	G2, G3, T8
21	75	30	1500	HA-2	G2, G3, G6, T8
22	75	30	1500	HA-2	G2, G3, T8
23	75	30	1500	HA-2	G2, G3, G6, T8
24	75	30	1500	HA-2	G2, G3, G4, T8
25	75	30	1500	HA-2	G2, G6, T8
26	75	30	1500	HA-2	G2, T8
27	75	30	1500	HA-2	G2, G6, T8
28	75	30	1500	HA-2	G2, G6, T8
29	75	30	1500	HA-2	G1, G2, T9
30	75	30	1500	HA-2	G1, G2, T9
31	75	30	1500	HA-2	G1, G2, T9
32	75	30	1500	HA-2	G2, G6, T9
33	75	30	1500	HA-2	G1, G2, T9
34	75	30	1500	HA-2	G1, G2, G6, T9
35	75	30	1500	HA-2	G1, G2, T9
36	75	30	1500	HA-2	G1, G2, G6, T9
37	75	30	1500	HA-2	G1, G2, T9
38	75	30	1500	HA-2	G1, G2, G6, T9
39	75	30	1500	HA-2	G1, G2, G6, T9
40	75	30	1500	HA-2	G2, G3, T8
41	75	30	1500	HA-2	G2, G3, T8
42	75	30	1500	HA-2	G2, G3, T8
43	75	30	1500	HA-2	G2, G3, G6, T8
44	75	30	1500	HA-2	G2, G3, T8
45	75	30	1500	HA-2	G2, G3, G6, T8

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	19.8	19.8	19.8	19.8	19.2	18.1	17.3	16.6	16.0	15.6	15.2	14.9	14.6	14.4	14.1	13.8	13.6
2	23.3	23.3	23.3	23.3	22.5	21.3	20.3	19.5	18.9	18.3	17.9	17.5	17.2	16.9	16.6	16.3	16.0
3	19.8	19.8	19.8	19.8	19.2	18.1	17.3	16.6	16.0	15.6	15.2	14.9	14.6	14.4	14.1	13.8	13.6
4	23.3	23.3	23.3	23.3	22.5	21.3	20.3	19.5	18.9	18.3	17.9	17.5	17.2	16.9	16.6	16.3	16.0
5	19.8	19.8	19.8	19.8	19.2	18.1	17.3	16.6	16.0	15.6	15.2	14.9	14.6	14.4	14.1	13.8	13.6
6	19.8	19.8	19.8	19.8	19.2	18.1	17.3	16.6	16.0	15.6	15.2	14.9	14.6	14.4	14.1	13.8	13.6
7	19.8	19.8	19.8	19.8	19.2	18.1	17.3	16.6	16.0	15.6	15.2	14.9	14.6	14.4	14.1	13.8	13.6
8	23.3	23.3	23.3	23.3	22.5	21.3	20.3	19.5	18.9	18.3	17.9	17.5	17.2	16.9	16.6	16.3	16.0
9	26.1	26.1	26.1	26.1	26.0	25.2	24.3	23.5	22.8	22.2	21.6	21.1	20.7	20.2	19.8	...	...
10	26.1	26.1	26.1	26.1	25.2	23.9	22.7	21.9	21.1	20.5	20.0	19.6	19.3	18.9	18.6	18.2	17.8
11	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
12	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
13	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
16	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
17	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
18	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
19	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
20	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
21	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
22	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
23	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
25	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
27	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
28	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
29	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
30	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
31	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
32	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
33	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
34	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
35	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
36	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
37	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
38	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
39	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
40	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
41	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
42	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
43	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
44	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
45	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...
2	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...
3	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...
4	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...
5	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...
6	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...
7	13.3	13.0	10.5	8.3	6.6	5.2	...	...	...	...	...	...
8	15.6	15.2	12.4	9.8	7.7	6.1	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...
10	17.4	17.0	12.4	...	...	...	...	...	...	...	...	...
11	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
12	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
13	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
14	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
15	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
16	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
17	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
18	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
19	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
20	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
21	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
22	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
23	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
24	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
25	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
26	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
27	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
28	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
29	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
30	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
31	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
32	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
33	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
34	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
35	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
36	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
37	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
38	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
39	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
40	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
41	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
42	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
43	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
44	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
45	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP348	S34800	...	...	8	1
2	18Cr-10Ni-Cb	Fittings	SA-403	348	S34800	CR	...	8	1
3	18Cr-10Ni-Cb	Fittings	SA-403	348	S34800	WP-S	...	8	1
4	18Cr-10Ni-Cb	Wld. fittings	SA-403	348	S34800	WP-W	...	8	1
5	18Cr-10Ni-Cb	Wld. fittings	SA-403	348	S34800	WP-WX	...	8	1
6	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	$t \leq 5$	8	1
7	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348H	S34809	...	...	8	1
8	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	8	1
9	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP348H	S34809	...	...	8	1
10	18Cr-10Ni-Cb	Wld. pipe	SA-312	TP348H	S34809	...	...	8	1
11	18Cr-10Ni-Cb	Fittings	SA-403	348H	S34809	CR	...	8	1
12	18Cr-10Ni-Cb	Fittings	SA-403	348H	S34809	WP-S	...	8	1
13	18Cr-10Ni-Cb	Wld. fittings	SA-403	348H	S34809	WP-W	...	8	1
14	18Cr-10Ni-Cb	Wld. fittings	SA-403	348H	S34809	WP-WX	...	8	1
15	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	$t > \frac{3}{8}$	8	1
(23) 16	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$t > \frac{3}{8}$	8	1
17	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	$t > \frac{3}{8}$	8	1
18	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	$t > \frac{3}{8}$	8	1
19	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	$t > 5$	8	1
20	18Cr-10Ni-Ti	Forgings	SA-965	F321	S32100	...	...	8	1
21	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	$t > 5$	8	1
22	18Cr-10Ni-Ti	Forgings	SA-965	F321H	S32109	...	...	8	1
23	18Cr-10Ni-Ti	Plate	SA/EN 10028-7	X6CrNiTi18-10	...	...	≤ 3	8	1
24	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	$t \leq 5$	8	1
25	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...	...	8	1
26	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...	...	8	1
27	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	8	1
28	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321	S32100	...	$t \leq \frac{3}{8}$	8	1
29	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321	S32100	...	...	8	1
30	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$t \leq \frac{3}{8}$	8	1
31	18Cr-10Ni-Ti	Fittings	SA-403	321	S32100	CR	...	8	1
32	18Cr-10Ni-Ti	Fittings	SA-403	321	S32100	WP-S	...	8	1
33	18Cr-10Ni-Ti	Wld. fittings	SA-403	321	S32100	WP-W	...	8	1
34	18Cr-10Ni-Ti	Wld. fittings	SA-403	321	S32100	WP-WX	...	8	1
35	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	$t \leq 5$	8	1
36	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321H	S32109	...	...	8	1
37	18Cr-10Ni-Ti	Plate	SA-240	321H	S32109	...	...	8	1
38	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	8	1
(23) 39	18Cr-10Ni-Ti	Smls. pipe	SA-312	TP321H	S32109	...	$t \leq \frac{3}{8}$	8	1
(23) 40	18Cr-10Ni-Ti	Wld. pipe	SA-312	TP321H	S32109	...	$t \leq \frac{3}{8}$	8	1
41	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	$t \leq \frac{3}{8}$	8	1
42	18Cr-10Ni-Ti	Fittings	SA-403	321H	S32109	CR	...	8	1
43	18Cr-10Ni-Ti	Fittings	SA-403	321H	S32109	WP-S	...	8	1
44	18Cr-10Ni-Ti	Wld. fittings	SA-403	321H	S32109	WP-W	...	8	1
45	18Cr-10Ni-Ti	Wld. fittings	SA-403	321H	S32109	WP-WX	...	8	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	75	30	1500	HA-2	G2, G3, G4, T8
2	75	30	1500	HA-2	G1, G2, G6, T8
3	75	30	1500	HA-2	G1, G2, T8
4	75	30	1500	HA-2	G1, G2, G6, T8
5	75	30	1500	HA-2	G1, G2, G6, T8
6	75	30	1500	HA-2	G2, T9
7	75	30	1500	HA-2	G1, G2, T9
8	75	30	1500	HA-2	G2, G6, T9
9	75	30	1500	HA-2	G1, G2, T9
10	75	30	1500	HA-2	G1, G2, G6, T9
11	75	30	1500	HA-2	G1, G2, G6, T9
12	75	30	1500	HA-2	G1, G2, T9
13	75	30	1500	HA-2	G1, G2, G6, T9
14	75	30	1500	HA-2	G1, G2, G6, T9
15	70	25	1500	HA-2	G2, G3, T9
16	70	25	1500	HA-2	G2, G3, G4, T9
17	70	25	1500	HA-2	G2, T9
18	70	25	1500	HA-2	G1, G2, T9
19	70	30	1500	HA-2	G2, G3, T8
20	70	30	1500	HA-2	G2, G3, T8
21	70	30	1500	HA-2	G1, G2, T9
22	70	30	1500	HA-2	G1, G2, G3, T9
23	73	29	1022	HA-2	G2, G3, G16, T9
24	75	30	1500	HA-2	G2, G3, T8
25	75	30	1500	HA-2	G2, G3, T8
26	75	30	1500	HA-2	G2, G3, T8
27	75	30	1500	HA-2	G2, G3, G6, T8
28	75	30	1500	HA-2	G2, G3, T8
29	75	30	1500	HA-2	G2, G3, G6, T8
30	75	30	1500	HA-2	G2, G3, G4, T8
31	75	30	1500	HA-2	G2, G6, T8
32	75	30	1500	HA-2	G2, T8
33	75	30	1500	HA-2	G2, G6, T8
34	75	30	1500	HA-2	G2, G6, T8
35	75	30	1500	HA-2	G1, G2, T9
36	75	30	1500	HA-2	G1, G2, T9
37	75	30	1500	HA-2	G1, G2, T9
38	75	30	1500	HA-2	G2, G6, T9
39	75	30	1500	HA-2	G2, T9
40	75	30	1500	HA-2	G2, G6, T9
41	75	30	1500	HA-2	G1, G2, T9
42	75	30	1500	HA-2	G1, G2, G6, T9
43	75	30	1500	HA-2	G1, G2, T9
44	75	30	1500	HA-2	G1, G2, G6, T9
45	75	30	1500	HA-2	G1, G2, G6, T9

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
2	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
4	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
8	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
10	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
11	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
12	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	19.0	18.7	18.5	18.3	18.2	18.1
13	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
14	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.1	15.9	15.7	15.6	15.5	15.4
15	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.6	16.1	15.6	15.2	14.9	14.6	14.3	14.1	13.9	13.8
16	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.6	16.1	15.6	15.2	14.9	14.6	14.3	14.1	13.9	13.8
17	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.6	16.1	15.6	15.2	14.9	14.6	14.3	14.1	13.9	13.8
18	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.6	16.1	15.6	15.2	14.9	14.6	14.3	14.1	13.9	13.8
19	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
20	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
21	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
22	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
23	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3	18.7	18.1	17.7	17.2	16.9	16.6	16.4	16.2	16.0
24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
25	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
27	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
28	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
29	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
30	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
31	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
32	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
33	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
34	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
35	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
36	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
37	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
38	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
39	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
40	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
41	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
42	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
43	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.8	18.3	17.9	17.5	17.2	16.9	16.7	16.5
44	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1
45	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	16.0	15.5	15.2	14.9	14.6	14.4	14.2	14.1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
2	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
3	18.1	16.0	12.1	9.1	6.1	4.4	3.3	2.2	1.5	1.2	0.90	0.80
4	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
5	15.4	13.6	10.3	7.8	5.2	3.8	2.8	1.9	1.3	1.0	0.76	0.68
6	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
7	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
8	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
9	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
10	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
11	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
12	18.1	18.1	17.4	14.1	10.5	7.9	5.9	4.4	3.2	2.5	1.8	1.3
13	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
14	15.4	15.4	14.8	12.0	8.9	6.7	5.0	3.7	2.7	2.1	1.6	1.1
15	13.6	13.5	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
16	13.6	13.5	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
17	13.6	13.5	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1 (23)
18	13.6	13.5	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
19	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
20	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
21	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
22	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
23	15.8	15.7	9.6	...	...	...	...	...	...	...	...	...
24	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
25	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
26	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
27	13.9	13.8	8.2	5.9	4.3	3.1	2.2	1.4	0.94	0.68	0.43	0.26
28	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
29	13.9	13.8	8.2	5.9	4.3	3.1	2.2	1.4	0.94	0.68	0.43	0.26
30	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
31	13.9	13.8	8.2	5.9	4.3	3.1	2.2	1.4	0.94	0.68	0.43	0.26
32	16.4	16.2	9.6	6.9	5.0	3.6	2.6	1.7	1.1	0.80	0.50	0.30
33	13.9	13.8	8.2	5.9	4.3	3.1	2.2	1.4	0.94	0.68	0.43	0.26
34	13.9	13.8	8.2	5.9	4.3	3.1	2.2	1.4	0.94	0.68	0.43	0.26
35	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
36	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
37	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
38	13.9	13.8	10.5	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94
39	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1 (23)
40	13.9	13.8	10.5	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94 (23)
41	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
42	13.9	13.8	10.5	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94
43	16.4	16.2	12.3	9.1	6.9	5.4	4.1	3.2	2.5	1.9	1.5	1.1
44	13.9	13.8	10.5	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94
45	13.9	13.8	10.5	7.7	5.9	4.6	3.5	2.7	2.1	1.6	1.3	0.94

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy	Class/ Condition/ Temper	Size/ Thickness, in.	P-No.	Group No.	
					Desig./ UNS No.					
(23)	1	18Cr-12Ni-2Mo	Castings	SA-351	CF8M	J92900	...	...	8	1
	2	18Cr-13Ni-3Mo	Plate	SA-240	317	S31700	...	$t \leq 5$	8	1
	3	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	8	1
	4	18Cr-13Ni-3Mo	Smls. pipe	SA-312	TP317	S31700	...	$t \leq 5$	8	1
	5	18Cr-13Ni-3Mo	Wld. pipe	SA-312	TP317	S31700	...	$t \leq 5$	8	1
	6	18Cr-13Ni-3Mo	Fittings	SA-403	317	S31700	WP-S	...	8	1
	7	18Cr-13Ni-3Mo	Plate	SA-240	317L	S31703	...	...	8	1
	8	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	WP-S	...	8	1
	9	18Cr-18Ni-2Si	Smls. tube	SA-213	XM-15	S38100	...	$t \leq 5$	8	1
	10	18Cr-18Ni-2Si	Plate	SA-240	XM-15	S38100	...	$t \leq 5$	8	1
	11	18Cr-18Ni-2Si	Wld. tube	SA-249	TPXM-15	S38100	...	$t \leq 5$	8	1
	12	18Cr-18Ni-2Si	Smls. pipe	SA-312	TPXM-15	S38100	...	$t \leq 5$	8	1
	13	18Cr-18Ni-2Si	Wld. pipe	SA-312	TPXM-15	S38100	...	$t \leq 5$	8	1
	14	21Cr-6Ni-9Mn	Forgings	SA-182	FXM-11	S21904	...	...	8	3
	15	21Cr-6Ni-9Mn	Smls. pipe	SA-312	TPXM-11	S21904	...	...	8	3
	16	21Cr-6Ni-9Mn	Wld. pipe	SA-312	TPXM-11	S21904	...	...	8	3
	17	21Cr-6Ni-9Mn	Plate	SA-666	XM-11	S21904	...	...	8	3
	18	21Cr-6Ni-9Mn	Forgings	SA-965	FXM-11	S21904	...	...	8	3
	19	22Cr-5Ni-3Mo-N	Forgings	SA-182	F51	S31803	...	...	10H	1
	20	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...	...	10H	1
	21	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S31803	...	...	10H	1
	22	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S31803	...	...	10H	1
	23	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S31803	...	...	10H	1
	24	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S31803	...	...	10H	1
	25	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S32205	...	...	10H	1
	26	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S32205	...	...	10H	1
	27	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S32205	...	...	10H	1
	28	22Cr-5Ni-3Mo-N	Forgings	SA-182	F60	S32205	...	...	10H	1
	29	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S32205	...	O.D. ≤ 8	10H	1
	30	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S32205	...	O.D. ≤ 8	10H	1
	31	22Cr-13Ni-5Mn	Forgings	SA-182	FXM-19	S20910	...	...	8	3
	32	22Cr-13Ni-5Mn	Plate	SA-240	XM-19	S20910	...	...	8	3
	33	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...	...	8	3
	34	22Cr-13Ni-5Mn	Smls. pipe	SA-312	TPXM-19	S20910	...	...	8	3
	35	22Cr-13Ni-5Mn	Wld. pipe	SA-312	TPXM-19	S20910	...	...	8	3
	36	22Cr-13Ni-5Mn	Fittings	SA-403	XM-19	S20910	CR	...	8	3
	37	22Cr-13Ni-5Mn	Wld. fittings	SA-403	XM-19	S20910	WP-W	...	8	3
	38	22Cr-13Ni-5Mn	Wld. fittings	SA-403	XM-19	S20910	WP-WX	...	8	3
	39	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	...	...	8	3
	40	22Cr-13Ni-5Mn	Forgings	SA-965	FXM-19	S20910	...	...	8	3
	41	23Cr-4Ni-Mo-Cu-N	Plate	SA-240	...	S32304	...	...	10H	1
	42	23Cr-12Ni	Fittings	SA-403	309	S30900	...	...	8	2
	43	23Cr-12Ni	Fittings	SA-403	309	S30900	WP-S	...	8	2
	44	23Cr-12Ni	Wld. fittings	SA-403	309	S30900	WP-W	...	8	2
	45	23Cr-12Ni	Wld. fittings	SA-403	309	S30900	WP-WX	...	8	2

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	70	30	1500	HA-2	G2, G3, G4, G8, T10
2	75	30	1500	HA-2	G2, G3, T10
3	75	30	1500	HA-2	G2, G3, G6, T10
4	75	30	1500	HA-2	G2, G3, T10
5	75	30	1500	HA-2	G2, G3, G6, T10
6	75	30	1500	HA-2	G2, T10
7	75	30	850	HA-4	G2
8	75	30	850	HA-4	G2
9	75	30	1000	HA-2	G2, G3
10	75	30	1000	HA-2	G2, G3
11	75	30	1000	HA-2	G2, G3, G6
12	75	30	1000	HA-2	G2, G3
13	75	30	1000	HA-2	G2, G3, G6
14	90	50	600	HA-6	G2
15	90	50	600	HA-6	G2
16	90	50	600	HA-6	G2, G6
17	90	50	600	HA-6	G2
18	90	50	600	HA-6	G2
19	90	65	400	HA-5	G8
20	90	65	400	HA-5	G8
21	90	65	400	HA-5	G8
22	90	65	400	HA-5	G6, G8
23	90	65	400	HA-5	G8
24	90	65	400	HA-5	G6, G8
25	95	65	400	HA-5	G8
26	95	65	400	HA-5	G8
27	95	65	400	HA-5	G6, G8
28	95	70	400	HA-5	G8
29	95	70	400	HA-5	G8
30	95	70	400	HA-5	G6, G8
31	100	55	1200	HA-6	G2, T10
32	100	55	1200	HA-6	G2, T10
33	100	55	1200	HA-6	G2, G6, T10
34	100	55	1200	HA-6	G2, T10
35	100	55	1200	HA-6	G2, G6, T10
36	100	55	1200	HA-6	G2, G6, T10
37	100	55	1200	HA-6	G2, G6, T10
38	100	55	1200	HA-6	G2, G6, T10
39	100	55	1200	HA-6	G2, T10
40	100	55	1200	HA-6	G2, T10
41	87	58	600	HA-6	G2, G8
42	75	30	1500	HA-2	G2, G6, T7
43	75	30	1500	HA-2	G2, T7
44	75	30	1500	HA-2	G2, G6, T7
45	75	30	1500	HA-2	G2, G6, T7

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
2	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
3	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
4	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
5	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.5	14.1	13.9	13.7	13.5	13.4	13.2
6	20.0	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.4	17.0	16.6	16.3	16.1	15.9	15.7	15.6
7	20.0	20.0	20.0	20.0	20.0	19.6	18.9	18.2	17.7	17.3	16.9	16.5	16.2	15.8	15.5	15.2	...
8	20.0	20.0	20.0	20.0	20.0	19.6	18.9	18.2	17.7	17.3	16.9	16.5	16.2	15.8	15.5	15.2	...
9	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
10	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
11	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
12	20.0	20.0	20.0	20.0	20.0	19.3	18.6	18.0	17.5	17.0	16.6	16.2	15.8	15.5	15.2	14.9	14.6
13	17.0	17.0	17.0	17.0	17.0	16.4	15.8	15.3	14.8	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.4
14	33.3	33.3	33.3	32.0	29.7	27.9	26.4	25.3	24.4	23.7	23.1	...	...	...	...	...	...
15	33.3	33.3	33.3	32.0	29.7	27.9	26.4	25.3	24.4	23.7	23.1	...	...	...	...	...	...
16	28.3	28.3	28.3	27.2	25.3	23.7	22.5	21.5	20.7	20.1	19.7	...	...	...	...	...	...
17	33.3	33.3	33.3	32.0	29.7	27.9	26.4	25.3	24.4	23.7	23.1	...	...	...	...	...	...
18	33.3	33.3	33.3	32.0	29.7	27.9	26.4	25.3	24.4	23.7	23.1	...	...	...	...	...	...
19	37.5	37.5	37.5	37.0	35.8	34.9	34.2	...	...	...	...	...	...	...	...	...	...
20	37.5	37.5	37.5	37.0	35.8	34.9	34.2	...	...	...	...	...	...	...	...	...	...
21	37.5	37.5	37.5	37.0	35.8	34.9	34.2	...	...	...	...	...	...	...	...	...	...
22	31.9	31.9	31.9	31.5	30.5	29.7	29.0	...	...	...	...	...	...	...	...	...	...
23	37.5	37.5	37.5	37.0	35.8	34.9	34.2	...	...	...	...	...	...	...	...	...	...
24	31.9	31.9	31.9	31.9	31.9	31.9	31.9	...	...	...	...	...	...	...	...	...	...
25	39.6	...	38.5	...	35.8	...	34.2	...	...	...	...	...	...	...	...	...	...
26	39.6	...	38.5	...	35.8	...	34.2	...	...	...	...	...	...	...	...	...	...
27	33.6	...	32.7	...	30.5	...	29.0	...	...	...	...	...	...	...	...	...	...
28	39.6	...	39.6	...	38.6	...	36.8	...	...	...	...	...	...	...	...	...	...
29	39.6	...	39.6	...	38.6	...	36.8	...	...	...	...	...	...	...	...	...	...
30	33.6	...	33.6	...	32.8	...	31.3	...	...	...	...	...	...	...	...	...	...
31	36.7	36.7	36.7	36.7	36.7	36.7	36.7	35.8	35.0	34.3	33.7	33.1	32.6	32.2	31.8	31.4	31.1
32	36.7	36.7	36.7	36.7	36.7	36.7	36.7	35.8	35.0	34.3	33.7	33.1	32.6	32.2	31.8	31.4	31.1
33	31.2	31.2	31.2	31.2	31.2	31.2	31.2	30.4	29.7	29.1	28.6	28.2	27.7	27.4	27.0	26.7	26.4
34	36.7	36.7	36.7	36.7	36.7	36.7	36.7	35.8	35.0	34.3	33.7	33.1	32.6	32.2	31.8	31.4	31.1
35	31.2	31.2	31.2	31.2	31.2	31.2	31.2	30.4	29.7	29.1	28.6	28.2	27.7	27.4	27.0	26.7	26.4
36	31.2	31.2	31.2	31.2	31.2	31.2	31.2	30.4	29.7	29.1	28.6	28.2	27.7	27.4	27.0	26.7	26.4
37	31.2	31.2	31.2	31.2	31.2	31.2	31.2	30.4	29.7	29.1	28.6	28.2	27.7	27.4	27.0	26.7	26.4
38	31.2	31.2	31.2	31.2	31.2	31.2	31.2	30.4	29.7	29.1	28.6	28.2	27.7	27.4	27.0	26.7	26.4
39	36.7	36.7	36.7	36.7	36.7	36.7	36.7	35.8	35.0	34.3	33.7	33.1	32.6	32.2	31.8	31.4	31.1
40	36.7	36.7	36.7	36.7	36.7	36.7	36.7	35.8	35.0	34.3	33.7	33.1	32.6	32.2	31.8	31.4	31.1
41	36.3	35.0	33.2	31.9	30.9	30.1	29.6	29.3	28.9	28.5	28.1	...	...	...	...	...	...
42	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
43	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
44	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
45	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	15.4	15.3	15.1	12.4	9.8	7.4	5.6	4.2	3.2	2.4	1.8	1.4 (23)
2	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
3	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.5	1.1
4	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
5	13.1	13.0	12.9	10.5	8.3	6.3	4.7	3.5	2.6	1.9	1.5	1.1
6	15.4	15.3	15.1	12.4	9.8	7.4	5.5	4.1	3.1	2.3	1.7	1.3
7	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	14.3	14.0	...	...	...	...	...	...	...	...	...	...
10	14.3	14.0	...	...	...	...	...	...	...	...	...	...
11	12.1	11.9	...	...	...	...	...	...	...	...	...	...
12	14.3	14.0	...	...	...	...	...	...	...	...	...	...
13	12.1	11.9	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...
31	30.7	30.3	29.7	20.4	13.0	8.3	...	...	...	...	...	...
32	30.7	30.3	29.7	20.4	13.0	8.3	...	...	...	...	...	...
33	26.1	25.7	25.2	17.3	11.1	7.1	...	...	...	...	...	...
34	30.7	30.3	29.7	20.4	13.0	8.3	...	...	...	...	...	...
35	26.1	25.7	25.2	17.3	11.1	7.1	...	...	...	...	...	...
36	26.1	25.7	25.2	17.3	11.1	7.1	...	...	...	...	...	...
37	26.1	25.7	25.2	17.3	11.1	7.1	...	...	...	...	...	...
38	26.1	25.7	25.2	17.3	11.1	7.1	...	...	...	...	...	...
39	30.7	30.3	29.7	20.4	13.0	8.3	...	...	...	...	...	...
40	30.7	30.3	29.7	20.4	13.0	8.3	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...
42	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
43	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
44	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
45	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	23Cr-12Ni	Smls. tube	SA-213	TP309S	S30908	...	...	8	2
2	23Cr-12Ni	Plate	SA-240	309S	S30908	...	...	8	2
3	23Cr-12Ni	Wld. tube	SA-249	TP309S	S30908	...	...	8	2
4	23Cr-12Ni	Smls. pipe	SA-312	TP309S	S30908	...	...	8	2
5	23Cr-12Ni	Wld. pipe	SA-312	TP309S	S30908	...	...	8	2
6	23Cr-12Ni	Wld. pipe	SA-813	TP309S	S30908	...	...	8	2
7	23Cr-12Ni	Wld. pipe	SA-814	TP309S	S30908	...	...	8	2
8	23Cr-12Ni	Smls. tube	SA-213	TP309H	S30909	...	...	8	2
9	23Cr-12Ni	Plate	SA-240	309H	S30909	...	...	8	2
10	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...	...	8	2
11	23Cr-12Ni	Smls. pipe	SA-312	TP309H	S30909	...	...	8	2
12	23Cr-12Ni	Wld. pipe	SA-312	TP309H	S30909	...	...	8	2
13	23Cr-12Ni	Bar	SA-479	309H	S30909	...	...	8	2
14	23Cr-12Ni-Cb	Smls. tube	SA-213	TP309Cb	S30940	...	...	8	2
15	23Cr-12Ni-Cb	Plate	SA-240	309Cb	S30940	...	...	8	2
16	23Cr-12Ni-Cb	Wld. tube	SA-249	TP309Cb	S30940	...	...	8	2
17	23Cr-12Ni-Cb	Smls. pipe	SA-312	TP309Cb	S30940	...	...	8	2
18	23Cr-12Ni-Cb	Wld. pipe	SA-312	TP309Cb	S30940	...	...	8	2
19	23Cr-12Ni-Cb	Wld. pipe	SA-813	TP309Cb	S30940	...	...	8	2
20	23Cr-12Ni-Cb	Wld. pipe	SA-814	TP309Cb	S30940	...	...	8	2
21	24Cr-22Ni-6Mo-2W-Cu-N	Forgings	SA-182	F58	S31266	...	...	45	...
22	24Cr-22Ni-6Mo-2W-Cu-N	Smls. tube	SA-213	...	S31266	...	...	45	...
23	24Cr-22Ni-6Mo-2W-Cu-N	Plate	SA-240	...	S31266	...	...	45	...
24	24Cr-22Ni-6Mo-2W-Cu-N	Wld. tube	SA-249	...	S31266	...	...	45	...
25	24Cr-22Ni-6Mo-2W-Cu-N	Smls. pipe	SA-312	...	S31266	...	...	45	...
26	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-312	...	S31266	...	...	45	...
27	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-358	...	S31266	...	...	45	...
28	24Cr-22Ni-6Mo-2W-Cu-N	Smls. fittings	SA-403	...	S31266	...	...	45	...
29	24Cr-22Ni-6Mo-2W-Cu-N	Wld. fittings	SA-403	...	S31266	...	...	45	...
30	24Cr-22Ni-6Mo-2W-Cu-N	Bar, shapes	SA-479	...	S31266	...	...	45	...
31	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-813	...	S31266	...	...	45	...
32	25Cr-5Ni-3Mo-2Cu	Plate	SA-240	255	S32550	...	...	10H	1
33	25Cr-6Ni-Mo-N	Plate	SA-240	...	S31200	...	...	10H	1
34	25Cr-12Ni	Castings	SA-351	CH8	J93400	...	...	8	2
35	25Cr-12Ni	Castings	SA-351	CH20	J93402	...	...	8	2
36	25Cr-20Ni	Castings	SA-351	CK20	J94202	...	...	8	2
37	25Cr-20Ni	Forgings	SA-182	F310	S31000	...	$t \leq 5$	8	2
38	25Cr-20Ni	Forgings	SA-965	F310	S31000	...	...	8	2
39	25Cr-20Ni	Smls. tube	SA-213	TP310S	S31008	...	...	8	2
40	25Cr-20Ni	Plate	SA-240	310S	S31008	...	...	8	2
41	25Cr-20Ni	Wld. tube	SA-249	TP310S	S31008	...	...	8	2
42	25Cr-20Ni	Smls. pipe	SA-312	TP310S	S31008	...	...	8	2
43	25Cr-20Ni	Wld. pipe	SA-312	TP310S	S31008	...	...	8	2
44	25Cr-20Ni	Fittings	SA-403	310S	S31008	CR	...	8	2
45	25Cr-20Ni	Fittings	SA-403	310S	S31008	WP-S	...	8	2

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	75	30	1500	HA-2	G2, G3, T7
2	75	30	1500	HA-2	G2, G3, T7
3	75	30	1500	HA-2	G2, G6, T7
4	75	30	1500	HA-2	G2, G3, T7
5	75	30	1500	HA-2	G2, G3, G6, T7
6	75	30	1500	HA-2	G2, G3, G6, T7
7	75	30	1500	HA-2	G2, G3, G6, T7
8	75	30	1500	HA-2	G2, T8
9	75	30	1500	HA-2	G2, G4, T8
10	75	30	1500	HA-2	G2, G6, T8
11	75	30	1500	HA-2	G2, T8
12	75	30	1500	HA-2	G2, G6, T8
13	75	30	1500	HA-2	G2, T8
14	75	30	1500	HA-2	G2, G3, T7
15	75	30	1500	HA-2	G2, G3, T7
16	75	30	1500	HA-2	G2, G3, G6, T7
17	75	30	1500	HA-2	G2, G3, T7
18	75	30	1500	HA-2	G2, G3, G6, T7
19	75	30	1500	HA-2	G2, G3, G6, T7
20	75	30	1500	HA-2	G2, G3, G6, T7
21	109	61	800	HA-10	G2, G8
22	109	61	800	HA-10	G2, G8
23	109	61	800	HA-10	G2, G8
24	109	61	800	HA-10	G2, G6, G8
25	109	61	800	HA-10	G2, G8
26	109	61	800	HA-10	G2, G6, G8
27	109	61	800	HA-10	G2, G6, G8
28	109	61	800	HA-10	G2, G8
29	109	61	800	HA-10	G2, G6, G8
30	109	61	800	HA-10	G2, G8
31	109	61	800	HA-10	G2, G6, G8
32	110	80	500	HA-5	G8
33	100	65	650	HA-5	G2, G8
34	65	28	1500	HA-3	G2, G3, G4, G8, T8
35	70	30	1500	HA-2	G2, T8
36	65	28	1500	HA-3	G2, T8
37	75	30	1500	HA-2	G2, G3, G5, G7, T7
38	75	30	1500	HA-2	G2, G3, G5, G7, T7
39	75	30	1500	HA-2	G2, G3, G5, G7, T7
40	75	30	1500	HA-2	G2, G3, G5, G7, T7
41	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
42	75	30	1500	HA-2	G2, G3, G5, G7, T7
43	75	30	100	HA-2	G2, G3, G5, G6, G7
44	75	30	1500	HA-2	G2, G6, T7
45	75	30	1500	HA-2	G2, T7

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
3	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
4	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
6	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
10	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
11	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
12	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
13	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
16	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
17	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.9	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.5	17.2
18	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
19	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
20	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.1	14.8	14.6
21	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.6	40.4	40.3	40.1	...	...
22	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.6	40.4	40.3	40.1	...	...
23	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.6	40.4	40.3	40.1	...	...
24	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.5	34.4	34.2	34.1	...	...
25	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.6	40.4	40.3	40.1	...	...
26	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.5	34.4	34.2	34.1	...	...
27	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.5	34.4	34.2	34.1	...	...
28	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.6	40.4	40.3	40.1	...	...
29	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.5	34.4	34.2	34.1	...	...
30	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.6	40.4	40.3	40.1	...	...
31	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.5	34.4	34.2	34.1	...	...
32	45.8	45.8	45.8	44.7	42.9	41.4	40.3	39.6	39.1	...	...	...	...	...	...	...	...
33	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	40.9	40.1	39.2	38.0	...	...	...	...	...
34	18.7	18.7	18.7	18.7	18.7	18.6	18.2	17.9	17.7	17.4	17.1	16.7	16.3	15.9	15.4	14.9	14.4
35	20.0	20.0	20.0	20.0	20.0	19.9	19.5	19.2	18.9	18.6	18.3	17.9	17.5	17.0	16.5	16.0	15.4
36	18.7	18.7	18.7	18.7	18.7	18.6	18.2	17.9	17.7	17.4	17.1	16.7	16.3	15.9	15.4	14.9	14.4
37	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
38	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
39	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
40	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
41	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
42	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
43	17.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
45	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
2	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
3	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
4	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
5	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
6	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
7	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
8	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
9	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
10	14.4	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64
11	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
12	14.4	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64
13	16.9	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
14	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
15	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
16	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
17	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
18	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
19	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
20	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
21	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...
34	13.9	11.1	8.5	6.5	5.0	3.8	2.9	2.3	1.8	1.3	0.90	0.80
35	14.9	11.1	8.5	6.5	5.0	3.8	2.9	2.3	1.8	1.3	0.90	0.80
36	13.9	11.3	9.8	8.5	7.3	6.0	4.8	3.5	2.4	1.6	1.1	0.80
37	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
38	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
39	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
40	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
41	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
42	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20
43	...	...	...	...	...	...	...	...	...	...	...	...
44	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
45	15.9	9.9	7.1	5.0	3.6	2.5	1.5	0.80	0.50	0.40	0.30	0.20

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper	Size/Thickness, in.	P-No.	Group No.
1	25Cr-20Ni	Wld. fittings	SA-403	310S	S31008	WP-W	...	8	2
2	25Cr-20Ni	Wld. fittings	SA-403	310S	S31008	WP-WX	...	8	2
3	25Cr-20Ni	Wld. pipe	SA-813	TP310S	S31008	...	...	8	2
4	25Cr-20Ni	Wld. pipe	SA-814	TP310S	S31008	...	...	8	2
5	25Cr-20Ni	Smls. tube	SA-213	TP310H	S31009	...	...	8	2
6	25Cr-20Ni	Plate	SA-240	310H	S31009	...	...	8	2
7	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009	...	...	8	2
8	25Cr-20Ni	Smls. pipe	SA-312	TP310H	S31009	...	...	8	2
9	25Cr-20Ni	Wld. pipe	SA-312	TP310H	S31009	...	...	8	2
10	25Cr-20Ni-Cb	Wld. tube	SA-249	TP310Cb	S31040	...	...	8	2
11	25Cr-20Ni-Cb	Wld. pipe	SA-312	TP310Cb	S31040	...	...	8	2
12	25Cr-20Ni-Cb	Wld. pipe	SA-813	TP310Cb	S31040	...	...	8	2
13	25Cr-20Ni-Cb	Wld. pipe	SA-814	TP310Cb	S31040	...	...	8	2
14	25Cr-22Ni-2Mo-N	Forgings	SA-182	F310MoLN	S31050	...	...	8	2
15	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	$0.25 < t \leq 1.25$	8	2
16	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	$0.25 < t \leq 1.25$	8	2
17	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	$0.25 < t \leq 1.25$	8	2
18	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	...	8	2
19	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	$t \leq 0.25$	8	2
20	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	$t \leq 0.25$	8	2
21	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	$t \leq 0.25$	8	2
22	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	$t \geq 0.40$	10H	1
23	29Cr-6.5Ni-2Mo-N	Bar	SA-479	...	S32906	...	...	10H	1
24	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	$t \geq 0.40$	10H	1
25	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	$t \geq 0.40$	10H	1
26	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	$t < 0.40$	10H	1
27	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	$t < 0.40$	10H	1
28	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	$t < 0.40$	10H	1

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	75	30	1500	HA-2	G2, G6, T7
2	75	30	1500	HA-2	G2, G6, T7
3	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
4	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
5	75	30	1500	HA-2	G2, T8
6	75	30	1500	HA-2	G2, T8
7	75	30	1500	HA-2	G2, G6, T8
8	75	30	1500	HA-2	G2, T8
9	75	30	1500	HA-2	G2, G6, T8
10	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
11	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
12	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
13	75	30	1500	HA-2	G2, G3, G5, G6, G7, T7
14	78	37	900	HA-2	...
15	78	37	900	HA-2	...
16	78	37	900	HA-2	G6
17	78	37	900	HA-2	G6
18	80	35	600	HA-2	...
19	84	39	900	HA-2	...
20	84	39	900	HA-2	G6
21	84	39	900	HA-2	G6
22	109	80	600	HA-5	G8
23	109	80	600	HA-5	G8
24	109	80	600	HA-5	G8
25	109	80	600	HA-5	G8
26	116	94	600	HA-5	G8
27	116	94	600	HA-5	G8
28	116	94	600	HA-5	G8

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
2	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
3	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
4	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.3	18.9	18.5	18.2	17.9	17.7	17.4	17.2	16.9
9	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
10	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
11	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
12	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
13	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.4	16.0	15.7	15.5	15.2	15.0	14.8	14.6	14.4
14	24.7	24.7	24.7	24.7	24.7	24.7	24.0	23.3	22.7	22.1	21.5	21.0	20.4	19.9	19.4	18.9	18.5
15	24.7	24.7	24.7	24.7	24.7	24.7	24.0	23.3	22.7	22.1	21.5	21.0	20.4	19.9	19.4	18.9	18.5
16	21.0	21.0	21.0	21.0	21.0	21.0	20.4	19.8	19.3	18.8	18.3	17.8	17.4	16.9	16.5	16.1	15.7
17	21.0	21.0	21.0	21.0	21.0	21.0	20.4	19.8	19.3	18.8	18.3	17.8	17.4	16.9	16.5	16.1	15.7
18	23.3	23.3	23.3	23.3	23.3	23.3	22.7	22.0	21.4	20.9	20.3	...	...	...	...	...	...
19	26.0	26.0	26.0	26.0	26.0	26.0	25.3	24.5	23.9	23.3	22.7	22.1	21.5	21.0	20.5	20.0	19.5
20	22.1	22.1	22.1	22.1	22.1	22.1	21.5	20.9	20.3	19.8	19.3	18.8	18.3	17.8	17.4	17.0	16.6
21	22.1	22.1	22.1	22.1	22.1	22.1	21.5	20.9	20.3	19.8	19.3	18.8	18.3	17.8	17.4	17.0	16.6
22	45.4	45.4	45.4	43.5	41.6	40.6	40.0	...	37.9	36.8	36.8	...	...	...	...	...	...
23	45.4	45.4	45.4	43.5	41.6	40.6	40.0	...	37.9	36.8	36.8	...	...	...	...	...	...
24	45.4	45.4	45.4	43.5	41.6	40.6	40.0	...	37.9	36.8	36.8	...	...	...	...	...	...
25	45.4	45.4	45.4	43.5	41.6	40.6	40.0	...	37.9	36.8	36.8	...	...	...	...	...	...
26	48.3	48.3	48.3	48.3	48.3	47.7	47.0	...	44.6	43.3	43.3	...	...	...	...	...	...
27	48.3	48.3	48.3	48.3	48.3	47.7	47.0	...	44.6	43.3	43.3	...	...	...	...	...	...
28	48.3	48.3	48.3	48.3	48.3	47.7	47.0	...	44.6	43.3	43.3	...	...	...	...	...	...

Table 5A (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Ferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding												
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
1	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
2	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
3	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
4	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
5	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
6	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
7	14.2	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64
8	16.7	13.8	10.3	7.6	5.5	4.0	3.0	2.2	1.7	1.3	0.97	0.75
9	14.2	11.7	8.8	6.5	4.7	3.4	2.6	1.9	1.4	1.1	0.82	0.64
10	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
11	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
12	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
13	13.5	8.4	6.0	4.3	3.1	2.1	1.3	0.68	0.43	0.34	0.26	0.17
14	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...

NOTES TO TABLE 5A**GENERAL NOTES**

- (a) The following abbreviations are used: NT, Normalized and tempered; QT, Quenched and tempered; Smls., Seamless; Temp., Temperature; and Wld., Welded.
- (b) An alternative typeface is used for stress values obtained from time-dependent properties (see Notes T1 through T10).
- (c) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-516/SA-516M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-516 Grade 70 shall be used when SA-516M Grade 485 is used in construction.
- (d) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (e) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (f) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - GENERAL REQUIREMENTS

- G1 For temperatures above 1000°F, these stress values may be used only if the material is heat treated by heating to a minimum temperature of 2000°F, and quenching in water or rapidly cooling by other means.
- G2 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed 66²/₃% but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction. Table Y-2 lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give allowable stress values that will result in lower levels of permanent strain.
- G3 At temperatures over 1000°F, these stress values apply only when the carbon is 0.04% or higher. This note is applicable only when stresses above 1000°F are published.
- G4 For temperatures above 1000°F, these stress values may be used only if the material has been heat treated by heating to a minimum temperature of 1900°F and quenching in water or rapidly cooling by other means. This note is applicable only when stresses above 1000°F are published.
- G5 These stress values at temperatures of 1050°F and above should be used only when assurance is provided that the steel has a predominant grain size not finer than ASTM No. 6. This note is applicable only when stresses above 1000°F are published.
- G6 A quality factor of 0.85 has been applied in arriving at the maximum allowable stress values for this material.
- G7 These stress values shall be considered basic values to be used when no effort is made to control or check the grain size of the steel.
- G8 This steel may be expected to develop embrittlement after service at moderately elevated temperature; see Nonmandatory Appendix A, A-207 and A-208.
- G9 The tensile strength shall not be in excess of 20,000 psi above the specified minimum.
- G10 All forgings shall have a maximum tensile strength not in excess of 25 ksi above the specified minimum.
- G11 SA-723 is exempt from the requirement in Section VIII, Division 2, 6.7.6.3(b) that the average of the individual Brinell hardness numbers shall not be more than 10% below or 25% above the number corresponding to the tensile strength.
- G12 See Section VIII, Division 2, 3.4.
- G13 Upon prolonged exposure to temperatures above 800°F, the carbide phase of carbon steel may be converted to graphite. See Nonmandatory Appendix A, A-201 and A-202.
- G14 Upon prolonged exposure to temperatures above 875°F, the carbide phase of carbon-molybdenum steel may be converted to graphite. See Nonmandatory Appendix A, A-201 and A-202.
- G15 This material may be susceptible to temper embrittlement. See Nonmandatory Appendix A, A-203.
- G16 These stresses apply to all product forms (C, H, and P) as defined in SA/EN 10028-7.

NOTES - HEAT TREATMENT REQUIREMENTS

- H1 Annealed.
- H2 Normalized, normalized and tempered, or quenched and tempered.
- H3 For applications involving consideration of heat treatment after forming or welding, see Section VIII, Division 2, Table 6.15 for P-No. 10K, Group No. 1 materials.
- H4 Liquid quenched and tempered.

NOTES - SIZE REQUIREMENTS

- S1 The maximum thickness of forgings shall not exceed 3³/₄ in. (4 in. as heat treated).
- S2 The maximum section thickness shall not exceed 3 in. for double-normalized-and-tempered forgings, or 5 in. for quenched-and-tempered forgings.
- S3 Both NPS 8 and larger, and schedule 140 and heavier.
- S4 Either NPS 8 and larger and less than schedule 140 wall, or less than NPS 8 and all wall thicknesses.

NOTES TO TABLE 5A (CONT'D)**NOTES – TIME-DEPENDENT PROPERTIES**

- T1 Allowable stresses for temperatures of 650°F and above are values obtained from time-dependent properties.
 T2 Allowable stresses for temperatures of 700°F and above are values obtained from time-dependent properties.
 T3 Allowable stresses for temperatures of 750°F and above are values obtained from time-dependent properties.
 T4 Allowable stresses for temperatures of 800°F and above are values obtained from time-dependent properties.
 T5 Allowable stresses for temperatures of 850°F and above are values obtained from time-dependent properties.
 T6 Allowable stresses for temperatures of 900°F and above are values obtained from time-dependent properties.
 T7 Allowable stresses for temperatures of 950°F and above are values obtained from time-dependent properties.
 T8 Allowable stresses for temperatures of 1000°F and above are values obtained from time-dependent properties.
 T9 Allowable stresses for temperatures of 1050°F and above are values obtained from time-dependent properties.
 T10 Allowable stresses for temperatures of 1100°F and above are values obtained from time-dependent properties.

NOTES – WELDING REQUIREMENTS

- W1 Not for welded construction.
 W2 Welding is not permitted when carbon content exceeds 0.35% by ladle analysis except for limited types of welding, as allowed in Section VIII, Division 2, Part 6.
 W3 Nonwelded, or welded if the tensile strength of the Section IX reduced section tension test is not less than 100 ksi.
 W4 Welded, with the tensile strength of the Section IX reduced section tension test less than 100 ksi but not less than 95 ksi.
 W5 In welded construction, for temperatures above 850°F, the weld metal shall have a carbon content of greater than 0.05%.
 W6 Section IX, QW-250 Variables QW-404.12, QW-406.3, QW-407.2, and QW-409.1 shall also apply to this material. These variables shall be applied in accordance with the rules for welding of Section VIII, Division 2, Part 6.
 W7 The following, in addition to the variables in Section IX, QW-250, shall be considered as essential variables requiring requalification of the welding procedure:
 (a) An increase in the maximum or a decrease in the minimum specified preheat or interpass temperatures. The specified range of preheat temperatures shall not exceed 150°F.
 (b) A change in the thickness T of the welding procedure qualification test plate as follows:
 (1) For welded joints that are quenched and tempered after welding, any increase in thickness (the minimum thickness qualified in all cases is $\frac{1}{4}$ in.).
 (2) For welded joints that are not quenched and tempered after welding, any change as follows:
 (-a) for T less than $\frac{5}{8}$ in., any decrease in thickness (the maximum thickness qualified is $2T$);
 (-b) for T equal to $\frac{5}{8}$ in. and over, any departure from the range of $\frac{5}{8}$ in. to $2T$.

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Table 5B
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
1	...	Drawn smls. tube	SB-210	...	Alclad 3003	O
2	...	Drawn smls. tube	SB-210	...	Alclad 3003	H113
3	...	Smls. extr. tube	SB-241	...	Alclad 3003	O
4	...	Smls. extr. tube	SB-241	...	Alclad 3003	H112
5	...	Plate, sheet	SB-209	...	A93003	O
6	...	Plate, sheet	SB-209	...	A93003	H112
7	...	Plate, sheet	SB-209	...	A93003	H112
8	...	Plate, sheet	SB-209	...	A93003	H112
9	...	Drawn smls. tube	SB-210	...	A93003	O
10	...	Drawn smls. tube	SB-210	...	A93003	H113
11	...	Bar, rod, shapes	SB-221	...	A93003	O
12	...	Bar, rod, shapes	SB-221	...	A93003	H112
13	...	Smls. extr. tube	SB-241	...	A93003	O
14	...	Smls. pipe	SB-241	...	A93003	H112
15	...	Smls. extr. tube	SB-241	...	A93003	H112
16	...	Plate, sheet	SB-209	...	A93004	O
17	...	Plate, sheet	SB-209	...	A93004	H112
18	...	Plate, sheet	SB-209	...	A95052	O
19	...	Plate, sheet	SB-209	...	A95052	H112
20	...	Plate, sheet	SB-209	...	A95052	H112
21	...	Plate, sheet	SB-209	...	A95083	O
22	...	Plate, sheet	SB-209	...	A95083	O
23	...	Plate, sheet	SB-209	...	A95083	O
24	...	Plate, sheet	SB-209	...	A95083	O
25	...	Plate, sheet	SB-209	...	A95083	O
26	...	Plate, sheet	SB-209	...	A95083	H112
27	...	Plate, sheet	SB-209	...	A95083	H112
28	...	Bar, rod, shapes	SB-221	...	A95083	H111
29	...	Smls. extr. tube	SB-241	...	A95083	H111
30	...	Plate, sheet	SB-209	...	A95086	O
31	...	Plate, sheet	SB-209	...	A95086	H112
32	...	Plate, sheet	SB-209	...	A95086	H112
33	...	Plate, sheet	SB-209	...	A95086	H112
34	...	Plate, sheet	SB-209	...	A95086	H112
35	...	Plate, sheet	SB-209	...	A95454	O
36	...	Plate, sheet	SB-209	...	A95454	H112
37	...	Plate, sheet	SB-209	...	A95454	H112
38	...	Bar, rod, shapes	SB-221	...	A95454	O
39	...	Bar, rod, shapes	SB-221	...	A95454	H112
40	...	Smls. extr. tube	SB-241	...	A95454	O
41	...	Smls. extr. tube	SB-241	...	A95454	H112
42	...	Plate, sheet	SB-209	...	A96061	T4
43	...	Plate, sheet	SB-209	...	A96061	T451
44	...	Plate, sheet	SB-209	...	A96061	T6
45	...	Plate, sheet	SB-209	...	A96061	T651

Table 5B
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	$0.010 \leq t \leq 0.5$	21	13	4.5	400	NFA-7	G4, T3
2	$0.050 \leq t \leq 0.5$	21	13	4.5	400	NFA-7	G4, T3, W2
3	...	21	13	4.5	400	NFA-7	G4, T3
4	...	21	13	4.5	400	NFA-7	G4, T3, W2
5	$0.006 \leq t \leq 3$	21	14	5	400	NFA-1	G4, T4
6	$0.250 \leq t < 0.5$	21	17	10	400	NFA-1	G4, T2, W2
7	$0.5 \leq t \leq 2$	21	15	6	400	NFA-1	G4, T2, W2
8	$2 < t \leq 3$	21	14.5	6	400	NFA-1	G4, T2, W2
9	$0.010 \leq t \leq 0.5$	21	14	5	400	NFA-1	G4, T2
10	$0.010 \leq t \leq 0.5$	21	14	5	400	NFA-1	G4, T2, W2
11	...	21	14	5	400	NFA-1	G2, G4, T2
12	...	21	14	5	400	NFA-1	G2, G4, T2, W2
13	...	21	14	5	400	NFA-1	G4, T2
14	$t \geq 1$	21	14	5	400	NFA-1	G4, T2
15	...	21	14	5	400	NFA-1	G4, T2, W2
16	$0.006 \leq t \leq 3$	22	22	8.5	400	NFA-3	G4, T3
17	$0.250 \leq t \leq 3$	22	23	9	400	NFA-3	G4, T2, W2
18	$0.051 \leq t \leq 3$	22	25	9.5	400	NFA-8	G4, T2
19	$0.25 \leq t < 0.5$	22	28	16	400	NFA-8	G4, T2, W2
20	$0.5 \leq t \leq 3$	22	25	9.5	400	NFA-8	G4, T2, W2
21	$0.051 \leq t \leq 1.5$	25	40	18	150	NFA-11	G4, G6
22	$1.5 < t \leq 3$	25	39	17	150	NFA-11	G4, G6
23	$3 < t \leq 5$	25	38	16	150	NFA-11	G4, G6
24	$5 < t \leq 7$	25	37	15	150	NFA-11	G4, G6
25	$7 < t \leq 8$	25	36	14	150	NFA-11	G4, G6
26	$0.25 \leq t \leq 1.5$	25	40	18	150	NFA-11	G4, G6, W2
27	$1.5 < t \leq 3$	25	39	17	150	NFA-11	G4, G6, W2
28	$t \leq 5$	25	40	24	150	NFA-11	G2, G4, G6, W2
29	...	25	40	24	150	NFA-11	G4, G6, W2
30	$0.051 \leq t \leq 2$	25	35	14	150	NFA-9	G4, G6
31	$0.063 \leq t < 0.5$	25	36	18	150	NFA-9	G4, G6, W2
32	$0.5 \leq t < 1$	25	35	16	150	NFA-9	G4, G6, W2
33	$1 < t \leq 2$	25	35	14	150	NFA-9	G4, G6, W2
34	$2 < t \leq 3$	25	34	14	150	NFA-9	G4, G6, W2
35	$0.051 \leq t \leq 3$	22	31	12	400	NFA-6	G4, T1
36	$0.250 \leq t < 0.5$	22	32	18	400	NFA-6	G4, T2, W2
37	$0.5 \leq t \leq 3$	22	31	12	400	NFA-6	G4, T1, W2
38	$t \leq 5$	22	31	12	400	NFA-6	G2, G4, T1
39	$t \leq 5$	22	31	12	400	NFA-6	G2, G4, T1, W2
40	$t \leq 5$	22	31	12	400	NFA-6	G4, T1
41	$t \leq 5$	22	31	12	400	NFA-6	G4, T1, W2
42	$0.051 \leq t < 0.25$	23	30	16	400	NFA-13	G4, G8, T4, W3
43	$0.25 \leq t \leq 3$	23	30	16	400	NFA-13	G4, G8, T4, W3
44	$0.051 \leq t < 0.25$	23	42	35	400	NFA-12	G4, G8, T2, W3
45	$0.25 \leq t \leq 4$	23	42	35	400	NFA-12,13	G4, G8, T2, W3, W4

Table 5B
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	3.0	2.9	2.8	2.7	2.5	1.9	1.5	...	...	...	...	...	...	...	...	...	...
2	3.0	2.9	2.8	2.7	2.5	1.9	1.5	...	...	...	...	...	...	...	...	...	...
3	3.0	2.9	2.8	2.7	2.5	1.9	1.5	...	...	...	...	...	...	...	...	...	...
4	3.0	2.9	2.8	2.7	2.5	1.9	1.5	...	...	...	...	...	...	...	...	...	...
5	3.3	3.2	3.1	3.0	2.8	2.6	2.3	...	...	...	...	...	...	...	...	...	...
6	6.7	6.4	6.3	6.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
7	4.0	3.9	3.8	3.6	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
8	4.0	3.8	3.8	3.6	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
9	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
10	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
11	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
12	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
13	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
14	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
15	3.3	3.2	3.1	3.0	2.7	1.9	1.5	...	...	...	...	...	...	...	...	...	...
16	5.7	5.7	5.7	5.7	5.7	3.8	2.3	...	...	...	...	...	...	...	...	...	...
17	6.0	6.0	6.0	6.0	5.7	3.8	2.3	...	...	...	...	...	...	...	...	...	...
18	6.3	6.3	6.3	6.3	6.1	4.1	2.3	...	...	...	...	...	...	...	...	...	...
19	10.7	10.7	10.7	10.7	6.1	4.1	2.3	...	...	...	...	...	...	...	...	...	...
20	6.3	6.3	6.3	6.3	6.1	4.1	2.3	...	...	...	...	...	...	...	...	...	...
21	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	11.3	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	11.3	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	16.0	16.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	16.0	16.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	12.0	12.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	10.7	10.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	9.3	9.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	8.0	8.0	8.0	7.5	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
36	12.0	12.0	12.0	12.0	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
37	8.0	8.0	8.0	7.5	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
38	8.0	8.0	8.0	7.5	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
39	8.0	8.0	8.0	7.5	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
40	8.0	8.0	8.0	7.5	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
41	8.0	8.0	8.0	7.5	5.5	4.1	3.0	...	...	...	...	...	...	...	...	...	...
42	10.7	10.5	10.4	10.2	10.2	10.2	5.2	...	...	...	...	...	...	...	...	...	...
43	10.7	10.5	10.4	10.2	10.2	10.2	5.2	...	...	...	...	...	...	...	...	...	...
44	17.5	17.5	17.5	17.5	16.7	10.7	5.2	...	...	...	...	...	...	...	...	...	...
45	17.5	17.5	17.5	17.5	16.7	10.7	5.2	...	...	...	...	...	...	...	...	...	...

Table 5B
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding															
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
1	...	Plate, sheet	SB-209	...	A96061	T651
2	...	Plate, sheet	SB-209	...	A96061	T6 wld.
3	...	Drawn smls. tube	SB-210	...	A96061	T4
4	...	Drawn smls. tube	SB-210	...	A96061	T6
5	...	Drawn smls. tube	SB-210	...	A96061	T6 wld.
6	...	Bar, rod, shapes	SB-221	...	A96061	T4
7	...	Bar, rod, shapes	SB-221	...	A96061	T6
8	...	Bar, rod, shapes	SB-221	...	A96061	T6 wld.
9	...	Smls. extr. tube/pipe	SB-241	...	A96061	T4
10	...	Smls. extr. tube/pipe	SB-241	...	A96061	T6
11	...	Smls. drawn pipe	SB-241	...	A96061	T6
12	...	Smls. drawn pipe	SB-241	...	A96061	T6
13	...	Smls. extr. tube/pipe	SB-241	...	A96061	T6 wld.
14	...	Smls. drawn pipe	SB-241	...	A96061	T6 wld.
15	...	Shapes	SB-308	...	A96061	T6
16	...	Shapes	SB-308	...	A96061	T6 wld.
17	...	Drawn smls. tube	SB-210	...	A96063	T6
18	...	Bar, rod, shapes	SB-221	...	A96063	T5
19	...	Bar, rod, shapes	SB-221	...	A96063	T5
20	...	Bar, rod, shapes	SB-221	...	A96063	T6
21	...	Smls. extr. tube	SB-241	...	A96063	T5
22	...	Smls. extr. tube	SB-241	...	A96063	T5
23	...	Smls. extr. tube	SB-241	...	A96063	T6
24	...	Bar, rod	SB-187	...	C10200	O60
25	...	Bar, rod	SB-187	...	C11000	O60
26	...	Smls. tube	SB-111	...	C28000	O61
27	...	Smls. tube	SB-111	...	C44300	O61
28	...	Smls. tube	SB-111	...	C44400	O61
29	...	Smls. tube	SB-111	...	C44500	O61
30	...	Plate	SB-171	...	C46400	M10, M20, O20, O25
31	...	Plate	SB-171	...	C46400	M10, M20, O20, O25
32	...	Smls. tube	SB-111	...	C60800	O61
33	...	Plate, sheet	SB-169	...	C61400	O25 or O60
34	...	Plate, sheet	SB-169	...	C61400	O25 or O60
35	...	Plate, sheet	SB-169	...	C61400	O25 or O60
(23) 36	...	Bar, rod	SB-98	...	C65100	O60
(23) 37	...	Bar, rod	SB-98	...	C65100	H02
(23) 38	...	Plate, sheet	SB-96	...	C65500	O61
(23) 39	...	Bar, rod	SB-98	...	C65500	O60
(23) 40	...	Bar, rod	SB-98	...	C65500	H02
(23) 41	...	Bar, rod	SB-98	...	C66100	O60
(23) 42	...	Bar, rod	SB-98	...	C66100	H02
43	...	Plate	SB-171	...	C70600	M10, M20, O20, O25
44	...	Condenser tubes	SB-111	...	C70600	O61
45	...	Smls. U-bend tube	SB-395	...	C70600	O61

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	$4 < t \leq 6$	23	40	35	400	NFA-12,13	G4, G8, T3, W3, W4
2	...	23	24	...	400	NFA-12	G4, G8, T4
3	$0.025 \leq t \leq 0.5$	23	30	16	400	NFA-13	G4, T4, W3
4	$0.025 \leq t \leq 0.5$	23	42	35	400	NFA-12,13	G4, T2, W3, W4
5	...	23	24	...	400	NFA-13	G4, T4, W4
6	...	23	26	16	400	NFA-13	G2, G4, G8, T4, W3
7	...	23	38	35	400	NFA-12,13	G2, G4, G8, T3, W3, W4
8	...	23	24	...	400	NFA-12,13	G2, G4, G8, T4, W4
9	...	23	26	16	400	NFA-13	G4, G8, T4, W3
10	...	23	38	35	400	NFA-12,13	G4, G8, T3, W3, W4
11	NPS < 1	23	42	35	400	NFA-12,13	G4, T2, W3, W4
12	NPS ≥ 1	23	38	35	400	NFA-12,13	G4, T3, W3, W4
13	...	23	24	...	400	NFA-12,13	G4, T4, W4
14	...	23	24	...	400	NFA-12,13	G4, T4, W4
15	...	23	38	35	400	NFA-12,13	G2, G4, T3, W3, W4
16	...	23	24	...	400	NFA-12,13	G2, G4, T4, W4
17	$0.025 \leq t \leq 0.5$	23	33	28	400	NFA-1	G4, T1, W3
18	$t \leq 0.5$	23	22	16	400	NFA-1	G2, G4, T1, W3
19	$0.501 \leq t \leq 1$	23	21	15	400	NFA-1	G2, G4, T1, W3
20	$t \leq 1$	23	30	25	400	NFA-1	G2, G4, T1, W3
21	$t \leq 0.5$	23	22	16	400	NFA-1	G4, T1, W3
22	$0.501 \leq t \leq 1$	23	21	15	400	NFA-1	G4, T1, W3
23	$t \leq 1$	23	30	25	400	NFA-1	G4, T1, W3
24	All	31	28	8	400	NFC-1	G1, G3, T3
25	All	31	28	8	400	NFC-1	G1, G3, T3
26	...	32	50	20	400	NFC-3	G3, G5, T3
27	...	32	45	15	400	NFC-2	G3, G5, T4
28	...	32	45	15	400	NFC-2	G3, G5, T4
29	...	32	45	15	400	NFC-2	G3, G5, T4
30	$3 < t \leq 5$	32	50	18	400	NFC-2	G3, T3
31	$t \leq 3$	32	50	20	400	NFC-2	G3, T3
32	...	35	50	19	500	NFC-3	G1, G3, G5, T3
33	$2 < t \leq 5$	35	65	28	500	NFC-8	G3
34	$\frac{1}{2} < t \leq 2$	35	70	30	500	NFC-8	G3
35	$t \leq \frac{1}{2}$	35	72	32	500	NFC-8	G3
36	All	33	40	12	350	NFC-1	G1, G3, G9
37	≤ 2	33	55	20	350	NFC-2	G1, G3, G9, W2
38	≤ 2	33	50	18	350	NFC-2	G1, G3, G9, T3
39	All	33	52	15	350	NFC-2	G1, G3, G9
40	≤ 2	33	70	38	350	NFC-2	G1, G3, G9, W2
41	All	33	52	15	350	NFC-2	G1, G3, G9
42	≤ 2	33	70	38	350	NFC-2	G1, G3, G9, W2
43	$t \leq 5$	34	40	15	600	NFC-3	G1, G3, T5
44	...	34	40	15	600	NFC-3	G1, G3, T5
45	...	34	40	15	600	NFC-3	G1, G3, T5

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	16.7	16.7	16.7	16.7	16.7	10.7	5.2	...	...	...	...	...	...	...	...	...	...
2	10.0	10.0	10.0	10.0	10.0	10.0	5.2	...	...	...	...	...	...	...	...	...	...
3	10.7	10.5	10.4	10.2	10.2	10.2	5.2	...	...	...	...	...	...	...	...	...	...
4	17.5	17.5	17.5	17.5	16.7	10.7	5.2	...	...	...	...	...	...	...	...	...	...
5	10.0	10.0	10.0	10.0	10.0	10.0	5.2	...	...	...	...	...	...	...	...	...	...
6	10.7	10.6	10.2	10.2	10.2	10.2	5.2	...	...	...	...	...	...	...	...	...	...
7	15.8	15.8	15.8	15.8	15.8	10.7	5.2	...	...	...	...	...	...	...	...	...	...
8	10.0	10.0	10.0	10.0	10.0	10.0	5.2	...	...	...	...	...	...	...	...	...	...
9	10.7	10.6	10.2	10.2	10.2	10.2	5.2	...	...	...	...	...	...	...	...	...	...
10	15.8	15.8	15.8	15.8	15.8	10.7	5.2	...	...	...	...	...	...	...	...	...	...
11	17.5	17.5	17.5	17.5	16.7	10.7	5.2	...	...	...	...	...	...	...	...	...	...
12	15.8	15.8	15.8	15.8	15.8	10.7	5.2	...	...	...	...	...	...	...	...	...	...
13	10.0	10.0	10.0	10.0	10.0	10.0	5.2	...	...	...	...	...	...	...	...	...	...
14	10.0	10.0	10.0	10.0	10.0	10.0	5.2	...	...	...	...	...	...	...	...	...	...
15	15.8	15.8	15.8	15.8	15.8	10.7	5.2	...	...	...	...	...	...	...	...	...	...
16	10.0	10.0	10.0	10.0	10.0	10.0	5.2	...	...	...	...	...	...	...	...	...	...
17	13.8	13.8	13.8	9.6	7.3	3.8	2.0	...	...	...	...	...	...	...	...	...	...
18	9.2	9.2	9.2	8.8	4.6	3.4	2.0	...	...	...	...	...	...	...	...	...	...
19	8.8	8.8	8.8	8.8	4.6	3.4	2.0	...	...	...	...	...	...	...	...	...	...
20	12.5	12.5	12.5	9.6	7.3	3.8	2.0	...	...	...	...	...	...	...	...	...	...
21	9.2	9.2	9.2	8.8	4.6	3.4	2.0	...	...	...	...	...	...	...	...	...	...
22	8.8	8.8	8.8	8.8	4.6	3.4	2.0	...	...	...	...	...	...	...	...	...	...
23	12.5	12.5	12.5	9.6	7.3	3.8	2.0	...	...	...	...	...	...	...	...	...	...
24	5.3	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...
25	5.3	5.3	5.3	5.3	5.3	4.4	3.0	...	...	...	...	...	...	...	...	...	...
26	13.3	13.3	13.3	13.3	13.3	10.8	5.3	...	...	...	...	...	...	...	...	...	...
27	10.0	10.0	10.0	10.0	10.0	10.0	5.3	...	...	...	...	...	...	...	...	...	...
28	10.0	10.0	10.0	10.0	10.0	10.0	5.3	...	...	...	...	...	...	...	...	...	...
29	10.0	10.0	10.0	10.0	10.0	10.0	5.3	...	...	...	...	...	...	...	...	...	...
30	12.0	12.0	12.0	11.9	11.9	6.4	2.7	...	...	...	...	...	...	...	...	...	...
31	13.3	13.3	13.3	13.3	13.3	6.4	2.7	...	...	...	...	...	...	...	...	...	...
32	12.7	12.7	12.7	12.7	12.7	10.0	6.0	4.0	2.0	...	...	...	...	...	...	...	...
33	18.7	18.6	18.5	18.4	18.2	18.1	17.9	17.7	17.6	...	...	...	...	...	...	...	...
34	20.0	19.9	19.8	19.7	19.5	19.4	19.2	19.0	18.8	...	...	...	...	...	...	...	...
35	21.3	21.3	21.1	20.9	20.9	20.7	20.5	20.3	20.1	...	...	...	...	...	...	...	...
36	8.0	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...	...	...	...	...	...
37	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...	...	...	...	...	...	...
38	12.0	12.0	12.0	12.0	12.0	10.7	...	...	...	...	...	...	...	...	...	...	...
39	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
40	25.3	25.3	25.3	25.3	25.3	25.3	...	...	...	...	...	...	...	...	...	...	...
41	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...	...	...	...	...	...
42	25.3	25.3	25.3	25.3	25.3	25.3	...	...	...	...	...	...	...	...	...	...	...
43	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...
44	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...
45	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding															
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
1	...	Plate	SB-171	...	C70620	M10, M20, O20, O25
2	...	Condenser tubes	SB-111	...	C70620	O61
3	...	Smls. U-bend tube	SB-395	...	C70620	O61
4	...	Plate	SB-171	...	C71500	M10, M20, O20, O25
5	...	Plate	SB-171	...	C71500	M10, M20, O20, O25
6	...	Condenser tubes	SB-111	...	C71500	O61
7	...	Smls. U-bend tube	SB-395	...	C71500	O61
8	...	Plate	SB-171	...	C71520	M10, M20, O20, O25
9	...	Plate	SB-171	...	C71520	M10, M20, O20, O25
10	...	Condenser tubes	SB-111	...	C71520	O61
11	...	Smls. U-bend tube	SB-395	...	C71520	O61
12	99Ni	Smls. pipe & tube	SB-161	...	N02200	Annealed
13	99Ni	Bar, rod	SB-160	...	N02200	Annealed
14	99Ni	Smls. pipe & tube	SB-161	...	N02200	Annealed
15	99Ni	Plate, sheet, strip	SB-162	...	N02200	Annealed
16	99Ni	Smls. tube	SB-163	...	N02200	Annealed
17	99Ni	Plate, sheet, strip	SB-162	...	N02200	As rolled
18	99Ni-Low C	Bar, rod	SB-160	...	N02201	Annealed
19	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed
20	99Ni-Low C	Bar, rod	SB-160	...	N02201	Hot fin.
21	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed
22	99Ni-Low C	Plate, sheet, strip	SB-162	...	N02201	Annealed
23	99Ni-Low C	Smls. tube	SB-163	...	N02201	Annealed
24	67Ni-30Cu	Bar, rod	SB-164	...	N04400	Annealed
25	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed
26	67Ni-30Cu	Forgings	SB-564	...	N04400	Annealed
27	67Ni-30Cu	Plate	SB-127	...	N04400	Annealed
28	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Annealed
29	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed
30	67Ni-30Cu	Plate	SB-127	...	N04400	As rolled
31	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Stress rel.
32	67Ni-30Cu-S	Bar, rod	SB-164	...	N04405	Annealed
33	47Ni-22Cr-9Mo-18Fe	Plate	SB-435	...	N06002	Annealed
34	47Ni-22Cr-9Mo-18Fe	Sheet	SB-435	...	N06002	Annealed
35	47Ni-22Cr-9Mo-18Fe	Rod	SB-572	...	N06002	Solution ann.
36	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.
37	47Ni-22Cr-9Mo-18Fe	Smls. pipe & tube	SB-622	...	N06002	Solution ann.
38	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.
39	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
40	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
41	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
42	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
43	47Ni-22Cr-19Fe-6Mo	Wld. pipe	SB-619	...	N06007	Solution ann.
44	47Ni-22Cr-19Fe-6Mo	Smls. pipe & tube	SB-622	...	N06007	Solution ann.
45	47Ni-22Cr-19Fe-6Mo	Wld. tube	SB-626	...	N06007	Solution ann.

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	$t \leq 5$	34	40	15	600	NFC-3	G1, G3, T5
2	...	34	40	15	600	NFC-3	G1, G3, T5
3	...	34	40	15	600	NFC-3	G1, G3, T5
4	$2\frac{1}{2} < t \leq 5$	34	45	18	700	NFC-4	G1, G3
5	$t \leq 2\frac{1}{2}$	34	50	20	700	NFC-4	G1, G3
6	...	34	52	18	700	NFC-4	G1, G3
7	...	34	52	18	700	NFC-4	G1, G3
8	$2\frac{1}{2} < t \leq 5$	34	45	18	700	NFC-4	G1, G3
9	$t \leq 2\frac{1}{2}$	34	50	20	700	NFC-4	G1, G3
10	...	34	52	18	700	NFC-4	G1, G3
11	...	34	52	18	700	NFC-4	G1, G3
12	O.D. > 5	41	55	12	600	NFN-2	G3
13	...	41	55	15	600	NFN-2	G2, G3
14	O.D. ≤ 5	41	55	15	600	NFN-2	G3
15	...	41	55	15	600	NFN-2	G3
16	...	41	55	15	600	NFN-2	G3
17	...	41	55	20	600	NFN-2	G3
18	...	41	50	10	600	NFN-1	G2, G3
19	O.D. > 5	41	50	10	1200	NFN-1	G3, T9
20	...	41	50	10	600	NFN-1	G2, G3
21	O.D. ≤ 5	41	50	12	1200	NFN-1	G3, T8
22	...	41	50	12	600	NFN-1	G3
23	...	41	50	12	1200	NFN-1	G3, T8
24	...	42	70	25	900	NFN-3	G1, G2, G3, T8
25	O.D. > 5	42	70	25	900	NFN-3	G1, G3, T8
26	...	42	70	25	900	NFN-3	G1, G2, G3, T8
27	...	42	70	28	900	NFN-3	G1, G3, T8
28	...	42	70	28	900	NFN-3	G1, G3, T8
29	O.D. ≤ 5	42	70	28	900	NFN-3	G1, G3, T8
30	...	42	75	40	900	NFN-3	G1, G3, T7
31	...	42	85	55	800	NFN-3	G1, G3, T7, W1
32	...	42	70	25	900	NFN-3	G1, G2, G3, T8
33	$\frac{3}{16} < t \leq 2\frac{1}{2}$	43	95	35	900	NFN-15	G1, G3, G13
34	$\frac{1}{16} < t \leq \frac{3}{16}$	43	95	35	900	NFN-15	G1, G3, G13
35	$t > \frac{3}{16}$	43	95	35	900	NFN-15	G1, G2, G3, G13
36	...	43	100	40	1650	NFN-15	G1, G3, G7, G13, T10
37	...	43	100	40	1650	NFN-15	G1, G3, G13, T10
38	...	43	100	40	1650	NFN-15	G1, G3, G7, G13, T10
39	$t > \frac{3}{4}$	45	85	30	1000	NFN-11	G1, G2, G3
40	$t > \frac{3}{4}$	45	85	30	1000	NFN-11	G1, G3
41	$\frac{5}{16} < t \leq \frac{3}{4}$	45	90	35	1000	NFN-11	G1, G2, G3, T10
42	$\frac{3}{16} < t \leq \frac{3}{4}$	45	90	35	1000	NFN-11	G1, G3, T10
43	...	45	90	35	1000	NFN-11	G1, G3, G7, T10
44	...	45	90	35	1000	NFN-11	G1, G3, T10
45	...	45	90	35	1000	NFN-11	G1, G3, G7, T10

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...
2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...
3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	7.0	6.0	...	...	...	...	...	...
4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...
5	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...
6	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...
7	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...
8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...
9	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...
10	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...
11	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	...	...	...	...
12	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...
13	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...
14	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...
15	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...
16	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	...	...	...	...	...	...
17	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	...	...	...	...	...	...
18	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	...	...	...	...	...	...
19	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	5.8	4.5
20	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	...	...	...	...	...	...
21	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.2	5.8	4.5
22	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	...	...	...	...	...	...
23	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.2	5.8	4.5
24	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	15.0	11.0	8.0
25	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	15.0	11.0	8.0
26	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	15.0	11.0	8.0
27	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	15.0	11.0	8.0
28	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	15.0	11.0	8.0
29	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	15.0	11.0	8.0
30	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	20.9	14.5	8.5	4.0
31	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	18.0	12.7	...	...
32	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	15.0	11.0	8.0
33	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.3	21.7	21.2	20.7	20.3	20.1	19.9	19.7	19.6
34	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.3	21.7	21.2	20.7	20.3	20.1	19.9	19.7	19.6
35	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.3	21.7	21.2	20.7	20.3	20.1	19.9	19.7	19.6
36	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.4	21.7	21.1	20.5	20.1	19.8	19.5	19.3	19.1	16.7
37	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.4	25.5	24.8	24.2	23.7	23.3	22.9	22.7	22.5	19.6
38	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.4	21.7	21.1	20.5	20.1	19.8	19.5	19.3	19.1	16.7
39	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.5	19.2	19.0	18.8	18.7	18.6	18.5
40	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.5	19.2	19.0	18.8	18.7	18.6	18.5
41	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.7	22.4	22.2	22.0	21.8	21.7	20.0
42	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.7	22.4	22.2	22.0	21.8	21.7	20.0
43	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.6	19.3	19.1	18.8	18.7	18.5	18.4	17.0
44	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.1	22.7	22.4	22.2	22.0	21.8	21.7	20.0
45	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.6	19.3	19.1	18.8	18.7	18.5	18.4	17.0

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding															
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	3.7	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	3.7	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	3.7	3.0	2.4	2.0	1.5	1.2	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	16.6	16.4	16.4	14.9	12.0	9.6	7.9	6.5	5.2	4.1	3.2	2.6	2.0	1.6	1.3
37	19.5	19.3	19.3	17.5	14.1	11.3	9.3	7.7	6.1	4.8	3.8	3.0	2.4	1.9	1.5
38	16.6	16.4	16.4	14.9	12.0	9.6	7.9	6.5	5.2	4.1	3.2	2.6	2.0	1.6	1.3
39	18.4	18.3	...	...	...	...	...	...	...	...	...	...	...	...	...
40	18.4	18.3	...	...	...	...	...	...	...	...	...	...	...	...	...
41	19.5	18.9	...	...	...	...	...	...	...	...	...	...	...	...	...
42	19.5	18.9	...	...	...	...	...	...	...	...	...	...	...	...	...
43	16.6	16.1	...	...	...	...	...	...	...	...	...	...	...	...	...
44	19.5	18.9	...	...	...	...	...	...	...	...	...	...	...	...	...
45	16.6	16.1	...	...	...	...	...	...	...	...	...	...	...	...	...

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
1	55Ni-21Cr-13.5Mo	Smls. & wld. fittings	SB-366	...	N06022	Solution ann.
2	55Ni-21Cr-13.5Mo	Forgings	SB-462	...	N06022	Solution ann.
3	55Ni-21Cr-13.5Mo	Forgings	SB-564	...	N06022	Solution ann.
4	55Ni-21Cr-13.5Mo	Rod	SB-574	...	N06022	Solution ann.
5	55Ni-21Cr-13.5Mo	Plate, sheet, strip	SB-575	...	N06022	Solution ann.
6	55Ni-21Cr-13.5Mo	Wld. pipe	SB-619	...	N06022	Solution ann.
7	55Ni-21Cr-13.5Mo	Smls. pipe & tube	SB-622	...	N06022	Solution ann.
8	55Ni-21Cr-13.5Mo	Wld. tube	SB-626	...	N06022	Solution ann.
9	59Ni-23Cr-16Mo	Wld. fittings	SB-366	...	N06059	Solution ann.
10	59Ni-23Cr-16Mo	Smls. fittings	SB-366	...	N06059	Solution ann.
11	59Ni-23Cr-16Mo	Forged fittings	SB-462	...	N06059	Solution ann.
12	59Ni-23Cr-16Mo	Forgings	SB-564	...	N06059	Solution ann.
13	59Ni-23Cr-16Mo	Bar, rod	SB-574	...	N06059	Solution ann.
14	59Ni-23Cr-16Mo	Plate, sheet, strip	SB-575	...	N06059	Solution ann.
15	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.
16	59Ni-23Cr-16Mo	Smls. pipe & tube	SB-622	...	N06059	Solution ann.
17	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.
18	61Ni-16Mo-16Cr	Rod	SB-574	...	N06455	Solution ann.
19	61Ni-16Mo-16Cr	Plate, sheet, strip	SB-575	...	N06455	Solution ann.
20	61Ni-16Mo-16Cr	Wld. pipe	SB-619	...	N06455	Solution ann.
21	61Ni-16Mo-16Cr	Smls. pipe & tube	SB-622	...	N06455	Solution ann.
22	61Ni-16Mo-16Cr	Wld. tube	SB-626	...	N06455	Solution ann.
23	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold worked/ann.
24	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed
25	72Ni-15Cr-8Fe	Bar, rod	SB-166	...	N06600	Annealed
26	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold worked/ann.
27	72Ni-15Cr-8Fe	Plate	SB-168	...	N06600	Annealed
28	72Ni-15Cr-8Fe	Forgings	SB-564	...	N06600	Annealed
29	72Ni-15Cr-8Fe	Wld. tube	SB-516	...	N06600	Cold drawn/ann.
30	72Ni-15Cr-8Fe	Wld. pipe	SB-517	...	N06600	Cold drawn/ann.
31	35Ni-19Cr-1.25Si	Bar	SB-511	...	N08330	Annealed
32	35Ni-19Cr-1.25Si	Smls. & wld. pipe	SB-535	...	N08330	Annealed
33	35Ni-19Cr-1.25Si	Plate, sheet, strip	SB-536	...	N08330	Annealed
34	42Fe-33Ni-21Cr	Smls. tube	SB-163	...	N08800	Annealed
35	42Fe-33Ni-21Cr	Smls. pipe & tube	SB-407	...	N08800	Annealed
36	42Fe-33Ni-21Cr	Plate	SB-409	...	N08800	Annealed
37	42Fe-33Ni-21Cr	Wld. pipe	SB-514	...	N08800	Annealed
38	42Fe-33Ni-21Cr	Wld. tube	SB-515	...	N08800	Annealed
39	42Fe-33Ni-21Cr	Forgings	SB-564	...	N08800	Annealed
40	42Fe-33Ni-21Cr	Bar, rod	SB-408	...	N08800	Hot fin.
41	42Fe-33Ni-21Cr	Smls. tube	SB-163	...	N08810	Annealed
42	42Fe-33Ni-21Cr	Smls. pipe & tube	SB-407	...	N08810	Annealed
43	42Fe-33Ni-21Cr	Bar, rod	SB-408	...	N08810	Annealed
44	42Fe-33Ni-21Cr	Plate	SB-409	...	N08810	Annealed
45	42Fe-33Ni-21Cr	Wld. pipe	SB-514	...	N08810	Annealed

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	...	43	100	45	1250	NFN-10	G1, G12, T13
2	...	43	100	45	1250	NFN-10	G1, G12, T13
3	...	43	100	45	1250	NFN-10	G1, G12, T13
4	...	43	100	45	1250	NFN-10	G1, G12, T13
5	...	43	100	45	1250	NFN-10	G1, G12, T13
6	...	43	100	45	1250	NFN-10	G1, G7, G12, T13
7	...	43	100	45	1250	NFN-10	G1, G12, T13
8	...	43	100	45	1250	NFN-10	G1, G7, G12, T13
9	...	43	100	45	1400	NFN-14	G1, G3, G7, G11, T14
10	...	43	100	45	1400	NFN-14	G1, G3, G11, T14
11	...	43	100	45	1400	NFN-14	G1, G3, G11, T14
12	...	43	100	45	1400	NFN-14	G1, G3, G11, T14
13	...	43	100	45	1400	NFN-14	G1, G3, G11, T14
14	...	43	100	45	1400	NFN-14	G1, G3, G11, T14
15	...	43	100	45	1400	NFN-14	G1, G3, G7, G11, T14
16	...	43	100	45	1400	NFN-14	G1, G3, G11, T14
17	...	43	100	45	1400	NFN-14	G1, G3, G7, G11, T14
18	...	43	100	40	800	NFN-14	G1, G2, G3
19	...	43	100	40	800	NFN-14	G1, G3
20	...	43	100	40	800	NFN-14	G1, G3, G7
21	...	43	100	40	800	NFN-14	G1, G3
22	...	43	100	40	800	NFN-14	G1, G3, G7
23	O.D. > 5	43	80	30	1200	NFN-4	G1, G3, T10
24	...	43	80	35	1200	NFN-4	G1, G3, T10
25	...	43	80	35	1200	NFN-4	G1, G2, G3, T10
26	O.D. ≤ 5	43	80	35	1200	NFN-4	G1, G3, T10
27	...	43	80	35	1200	NFN-4	G1, G3, T10
28	...	43	80	35	1200	NFN-4	G1, G2, G3, T10
29	O.D. ≤ 4½	43	80	35	1200	NFN-4	G1, G3, G7, T10
30	O.D. ≤ 4½	43	80	35	1200	NFN-4	G1, G3, G7, T10
31	...	46	70	30	1650	NFN-13	G1, G2, G3, G13, H1, T11
32	...	46	70	30	1650	NFN-13	G1, G3, G7, G10, H2, T11
33	...	46	70	30	1650	NFN-13	G1, G3, G10, H2, T11
34	...	45	75	30	1500	NFN-8	G1, G3, T12
35	...	45	75	30	1500	NFN-8	G1, G3, T12
36	...	45	75	30	1500	NFN-8	G1, G3, T12
37	...	45	75	30	1500	NFN-8	G1, G3, G7, T12
38	...	45	75	30	1500	NFN-8	G1, G3, G7, T12
39	...	45	75	30	1500	NFN-8	G1, G2, G3, T12
40	...	45	75	30	1500	NFN-8	G1, G2, G3, T12
41	...	45	65	25	1650	NFN-9	G1, G3, G13, T14
42	...	45	65	25	1650	NFN-9	G1, G3, G13, T14
43	...	45	65	25	1650	NFN-9	G1, G2, G3, G13, T14
44	...	45	65	25	1650	NFN-9	G1, G3, G13, T14
45	...	45	65	25	1650	NFN-9	G1, G3, G7, G13, T14

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	29.0	28.2	27.6	27.0	26.5	26.1	25.7	25.4	25.1
2	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	29.0	28.2	27.6	27.0	26.5	26.1	25.7	25.4	25.1
3	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	29.0	28.2	27.6	27.0	26.5	26.1	25.7	25.4	25.1
4	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	29.0	28.2	27.6	27.0	26.5	26.1	25.7	25.4	25.1
5	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	29.0	28.2	27.6	27.0	26.5	26.1	25.7	25.4	25.1
6	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4	24.7	24.0	23.4	22.9	22.5	22.2	21.8	21.6	21.4
7	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	29.0	28.2	27.6	27.0	26.5	26.1	25.7	25.4	25.1
8	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4	24.7	24.0	23.4	22.9	22.5	22.2	21.8	21.6	21.4
9	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.2	24.6	23.9	23.3	22.8	22.2	21.7	21.2	20.8
10	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	28.9	28.2	27.5	26.8	26.1	25.5	25.0	24.5
11	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	28.9	28.2	27.5	26.8	26.1	25.5	25.0	24.5
12	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	28.9	28.2	27.5	26.8	26.1	25.5	25.0	24.5
13	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	28.9	28.2	27.5	26.8	26.1	25.5	25.0	24.5
14	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	28.9	28.2	27.5	26.8	26.1	25.5	25.0	24.5
15	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.2	24.6	23.9	23.3	22.8	22.2	21.7	21.2	20.8
16	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.7	28.9	28.2	27.5	26.8	26.1	25.5	25.0	24.5
17	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.2	24.6	23.9	23.3	22.8	22.2	21.7	21.2	20.8
18	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8	...	...
19	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8	...	...
20	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.5	22.2	21.9	...	...
21	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8	...	...
22	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	...	...
23	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.0
24	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	16.0
25	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	16.0
26	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	16.0
27	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	16.0
28	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	16.0
29	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	13.6
30	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	13.6
31	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.4	18.9	18.5	18.1	17.7	17.4	17.0	16.7
32	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.4	18.9	18.5	18.1	17.7	17.4	17.0	16.7
33	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	19.4	18.9	18.5	18.1	17.7	17.4	17.0	16.7
34	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
35	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
36	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
37	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
38	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
39	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
40	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
41	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0	14.7	14.5
42	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0	14.7	14.5
43	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0	14.7	14.5
44	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0	14.7	14.5
45	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.0	13.7	13.3	13.0	12.8	12.5	12.3

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding															
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	24.9	24.7	24.1	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...
2	24.9	24.7	24.1	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...
3	24.9	24.7	24.1	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...
4	24.9	24.7	24.1	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...
5	24.9	24.7	24.1	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...
6	21.2	21.0	20.5	14.9	10.8	8.2	6.5	...	...	...	...	...	...	...	...
7	24.9	24.7	24.1	17.5	12.7	9.6	7.6	...	...	...	...	...	...	...	...
8	21.2	21.0	20.5	14.9	10.8	8.2	6.5	...	...	...	...	...	...	...	...
9	20.5	20.4	20.4	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...
10	24.2	24.0	24.0	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...
11	24.2	24.0	24.0	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...
12	24.2	24.0	24.0	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...
13	24.2	24.0	24.0	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...
14	24.2	24.0	24.0	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...
15	20.5	20.4	20.4	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...
16	24.2	24.0	24.0	18.8	14.6	11.6	9.4	7.4	5.9	4.8	...	...	...	...	...
17	20.5	20.4	20.4	16.0	12.4	9.9	8.0	6.3	5.0	4.1	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	10.6	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...
24	10.6	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...
25	10.6	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...
26	10.6	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...
27	10.6	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...
28	10.6	7.0	4.5	3.0	2.2	2.0	...	...	...	...	...	...	...	...	...
29	9.0	6.0	3.8	2.6	1.9	1.7	...	...	...	...	...	...	...	...	...
30	9.0	6.0	3.8	2.6	1.9	1.7	...	...	...	...	...	...	...	...	...
31	16.1	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48
32	16.1	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48
33	16.1	12.7	10.0	7.8	6.0	4.7	3.8	3.1	2.4	1.8	1.5	1.1	0.90	0.68	0.48
34	20.0	18.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...
35	20.0	18.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...
36	20.0	18.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...
37	17.0	16.1	12.3	9.4	7.1	4.8	3.1	1.4	1.2	0.80	0.72	0.58	...	...	...
38	17.0	16.1	12.3	9.4	7.1	4.8	3.1	1.4	1.2	0.80	0.72	0.58	...	...	...
39	20.0	18.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...
40	20.0	18.9	14.5	11.1	8.3	5.6	3.6	1.7	1.4	0.94	0.85	0.68	...	...	...
41	14.2	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.5	1.2	1.0
42	14.2	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.5	1.2	1.0
43	14.2	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.5	1.2	1.0
44	14.2	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.5	1.2	1.0
45	12.1	11.9	11.7	9.9	7.9	6.3	5.0	4.0	3.2	2.6	2.0	1.6	1.3	1.0	0.83

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
1	42Fe-33Ni-21Cr	Wld. tube	SB-515	...	N08810	Annealed
2	42Fe-33Ni-21Cr	Forgings	SB-564	...	N08810	Annealed
3	42Ni-21.5Cr-3Mo-2.3Cu	Smls. tube	SB-163	...	N08825	Annealed
4	42Ni-21.5Cr-3Mo-2.3Cu	Smls. pipe & tube	SB-423	...	N08825	Annealed
5	42Ni-21.5Cr-3Mo-2.3Cu	Plate, sheet, strip	SB-424	...	N08825	Annealed
6	42Ni-21.5Cr-3Mo-2.3Cu	Bar, rod	SB-425	...	N08825	Annealed
7	42Ni-21.5Cr-3Mo-2.3Cu	Forgings	SB-564	...	N08825	Annealed
8	62Ni-28Mo-5Fe	Plate	SB-333	...	N10001	Solution ann.
9	62Ni-28Mo-5Fe	Wld. pipe	SB-619	...	N10001	Solution ann.
10	62Ni-28Mo-5Fe	Smls. pipe & tube	SB-622	...	N10001	Solution ann.
11	62Ni-28Mo-5Fe	Wld. tube	SB-626	...	N10001	Solution ann.
12	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Solution ann.
13	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Solution ann.
14	62Ni-28Mo-5Fe	Sheet, strip	SB-333	...	N10001	Solution ann.
15	70Ni-16Mo-7Cr-5Fe	Plate, sheet, strip	SB-434	...	N10003	Annealed
16	70Ni-16Mo-7Cr-5Fe	Rod	SB-573	...	N10003	Solution ann.
17	54Ni-16Mo-15Cr	Smls. fittings	SB-366	...	N10276	Solution ann.
18	54Ni-16Mo-15Cr	Wld. fittings	SB-366	...	N10276	Solution ann.
19	54Ni-16Mo-15Cr	Forgings	SB-462	...	N10276	Solution ann.
20	54Ni-16Mo-15Cr	Rod	SB-574	...	N10276	Solution ann.
21	54Ni-16Mo-15Cr	Plate, sheet, strip	SB-575	...	N10276	Solution ann.
22	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.
23	54Ni-16Mo-15Cr	Smls. pipe & tube	SB-622	...	N10276	Solution ann.
24	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.
25	65Ni-28Mo-2Fe	Plate, sheet, strip	SB-333	...	N10665	Solution ann.
26	65Ni-28Mo-2Fe	Rod	SB-335	...	N10665	Solution ann.
27	65Ni-28Mo-2Fe	Smls. fittings	SB-366	...	N10665	Solution ann.
28	65Ni-28Mo-2Fe	Wld. fittings	SB-366	...	N10665	Solution ann.
29	65Ni-28Mo-2Fe	Forgings	SB-462	...	N10665	Solution ann.
30	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Solution ann.
31	65Ni-28Mo-2Fe	Smls. pipe & tube	SB-622	...	N10665	Solution ann.
32	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Solution ann.
(23) 33	Ti	Plate, sheet, strip	SB-265	1	R50250	Annealed
(23) 34	Ti	Bar, billet	SB-348	1	R50250	Annealed
(23) 35	Ti	Forgings	SB-381	1	R50250	Annealed
(23) 36	Ti	Smls. tube	SB-338	1	R50250	Smls. ann.
(23) 37	Ti	Smls. pipe	SB-861	1	R50250	Smls. ann.
(23) 38	Ti	Wld. tube	SB-338	1	R50250	Wld. ann.
(23) 39	Ti	Wld. pipe	SB-862	1	R50250	Wld. ann.
(23) 40	Ti	Plate, sheet, strip	SB-265	2	R50400	Annealed
(23) 41	Ti	Bar, billet	SB-348	2	R50400	Annealed
(23) 42	Ti	Forgings	SB-381	2	R50400	Annealed
(23) 43	Ti	Smls. tube	SB-338	2	R50400	Smls. ann.
(23) 44	Ti	Smls. pipe	SB-861	2	R50400	Smls. ann.
(23) 45	Ti	Wld. tube	SB-338	2	R50400	Wld. ann.

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	...	45	65	25	1650	NFN-9	G1, G3, G7, G13, T14
2	...	45	65	25	1650	NFN-9	G1, G2, G3, G13, T14
3	...	45	85	35	1000	NFN-7	G1, G3
4	...	45	85	35	1000	NFN-7	G1, G3
5	...	45	85	35	1000	NFN-7	G1, G3
6	...	45	85	35	1000	NFN-7	G1, G2, G3
7	...	45	85	35	1000	NFN-7	G1, G3
8	$\frac{3}{16} \leq t \leq 2\frac{1}{2}$	44	100	45	800	NFN-5	G1, G3
9	...	44	100	45	800	NFN-5	G1, G3, G7
10	...	44	100	45	800	NFN-5	G1, G3
11	...	44	100	45	800	NFN-5	G1, G3, G7
12	$1\frac{1}{2} < t \leq 3\frac{1}{2}$	44	100	46	800	NFN-5	G1, G2, G3
13	$\frac{5}{16} \leq t \leq 1\frac{1}{2}$	44	115	46	800	NFN-5	G1, G2, G3
14	$t < \frac{3}{16}$	44	115	50	800	NFN-5	G1, G3
15	$t < 2\frac{1}{2}$	44	100	40	800	NFN-6	G3
16	...	44	100	40	800	NFN-6	G1, G2, G3
17	...	43	100	41	800	NFN-10	G1, G3
18	...	43	100	41	800	NFN-10	G1, G3, G7
19	...	43	100	41	800	NFN-10	G1, G3
20	...	43	100	41	1250	NFN-10	G1, G2, G3, T13
21	...	43	100	41	1250	NFN-10	G1, G3, T13
22	...	43	100	41	1250	NFN-10	G1, G3, G7, T13
23	...	43	100	41	1250	NFN-10	G1, G3, T13
24	...	43	100	41	1250	NFN-10	G1, G3, G7, T13
25	...	44	110	51	800	NFN-16	G1, G3
26	...	44	110	51	800	NFN-16	G1, G2, G3
27	...	44	110	51	800	NFN-16	G1, G3
28	...	44	110	51	800	NFN-16	G1, G3, G7
29	...	44	110	51	800	NFN-16	G1, G3
30	...	44	110	51	800	NFN-16	G1, G3, G7
31	...	44	110	51	800	NFN-16	G1, G3
32	...	44	110	51	800	NFN-16	G1, G3, G7
33	...	51	35	25	600	NFT-3	...
34	...	51	35	25	600	NFT-3	...
35	...	51	35	25	600	NFT-3	...
36	...	51	35	25	600	NFT-3	...
37	...	51	35	25	600	NFT-3	...
38	...	51	35	25	600	NFT-3	G7
39	...	51	35	25	600	NFT-3	G7
40	...	51	50	40	600	NFT-2	...
41	...	51	50	40	600	NFT-2	...
42	...	51	50	40	600	NFT-2	...
43	...	51	50	40	600	NFT-2	...
44	...	51	50	40	600	NFT-2	...
45	...	51	50	40	600	NFT-2	G7

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.0	13.7	13.3	13.0	12.8	12.5	12.3
2	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.5	16.1	15.7	15.3	15.0	14.7	14.5
3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0	22.9	22.8
4	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0	22.9	22.8
5	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0	22.9	22.8
6	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0	22.9	22.8
7	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.3	23.2	23.0	22.9	22.8
8	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	...	...
9	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4	...	...
10	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.9	...	...
11	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.4	...	...
12	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.5	...	...
13	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.5	...	...
14	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.2	...	...
15	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8	25.5	25.3	24.9	...	...
16	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.5	26.1	25.8	25.5	25.3	24.9	...	...
17	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1	...	...
18	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.8	22.1	21.5	20.9	20.4	20.0	19.6	...	...
19	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1	...	...
20	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1	22.8	22.6
21	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1	22.8	22.6
22	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.8	22.1	21.5	20.9	20.4	20.0	19.6	19.4	19.2
23	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	26.9	26.0	25.2	24.6	24.0	23.5	23.1	22.8	22.6
24	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.8	22.1	21.5	20.9	20.4	20.0	19.6	19.4	19.2
25	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	...	...
26	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	...	...
27	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	...	...
28	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	...	...
29	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	...	...
30	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	...	...
31	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	...	...
32	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	...	...
33	14.6	13.4	11.7	10.2	9.0	7.8	6.8	5.9	5.2	4.7	4.4	...	...	...	...	...	...
34	14.6	13.4	11.7	10.2	9.0	7.8	6.8	5.9	5.2	4.7	4.4	...	...	...	...	...	...
35	14.6	13.4	11.7	10.2	9.0	7.8	6.8	5.9	5.2	4.7	4.4	...	...	...	...	...	...
36	14.6	13.4	11.7	10.2	9.0	7.8	6.8	5.9	5.2	4.7	4.4	...	...	...	...	...	...
37	14.6	13.4	11.7	10.2	9.0	7.8	6.8	5.9	5.2	4.7	4.4	...	...	...	...	...	...
38	12.4	11.4	9.9	8.7	7.6	6.7	5.8	5.1	4.5	4.0	3.8	...	...	...	...	...	...
39	12.4	11.4	9.9	8.7	7.6	6.7	5.8	5.1	4.5	4.0	3.8	...	...	...	...	...	...
40	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
41	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
42	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
43	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
44	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
45	17.7	17.7	17.7	16.2	14.5	12.8	11.1	9.6	8.4	7.4	6.8	...	...	...	...	...	...

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding															
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	12.1	11.9	11.7	9.9	7.9	6.3	5.0	4.0	3.2	2.6	2.0	1.6	1.3	1.0	0.83
2	14.2	14.0	13.8	11.6	9.3	7.4	5.9	4.7	3.8	3.0	2.4	1.9	1.5	1.2	1.0
3	22.6	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	22.6	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...
5	22.6	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...
6	22.6	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...
7	22.6	22.3	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	22.4	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...
21	22.4	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...
22	19.0	19.0	15.7	12.8	10.4	8.3	6.6	...	...	...	...	...	...	...	...
23	22.4	22.3	18.5	15.0	12.2	9.8	7.8	...	...	...	...	...	...	...	...
24	19.0	19.0	15.7	12.8	10.4	8.3	6.6	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
(23) 1	Ti	Wld. pipe	SB-862	2	R50400	Wld. ann.
(23) 2	Ti	Plate, sheet, strip	SB-265	3	R50550	Annealed
(23) 3	Ti	Bar, billet	SB-348	3	R50550	Annealed
(23) 4	Ti	Forgings	SB-381	3	R50550	Annealed
(23) 5	Ti	Smls. tube	SB-338	3	R50550	Smls. ann.
(23) 6	Ti	Smls. pipe	SB-861	3	R50550	Smls. ann.
(23) 7	Ti	Wld. tube	SB-338	3	R50550	Wld. ann.
(23) 8	Ti	Wld. pipe	SB-862	3	R50550	Wld. ann.
(23) 9	Ti-Pd	Plate, sheet, strip	SB-265	7	R52400	Annealed
(23) 10	Ti-Pd	Bar, billet	SB-348	7	R52400	Annealed
(23) 11	Ti-Pd	Forgings	SB-381	F-7	R52400	Annealed
(23) 12	Ti-Pd	Smls. tube	SB-338	7	R52400	Smls. ann.
(23) 13	Ti-Pd	Smls. pipe	SB-861	7	R52400	Smls. ann.
(23) 14	Ti-Pd	Wld. tube	SB-338	7	R52400	Wld. ann.
(23) 15	Ti-Pd	Wld. pipe	SB-862	7	R52400	Wld. ann.
(23) 16	Ti-Pd	Plate, sheet, strip	SB-265	16	R52402	Annealed
(23) 17	Ti-Pd	Smls. tube	SB-338	16	R52402	Annealed
(23) 18	Ti-Pd	Wld. tube	SB-338	16	R52402	Annealed
(23) 19	Ti-Pd	Bar, billet	SB-348	16	R52402	Annealed
(23) 20	Ti-Pd	Forgings	SB-381	F-16	R52402	Annealed
(23) 21	Ti-0.3Mo-0.8Ni	Plate, sheet, strip	SB-265	12	R53400	Annealed
(23) 22	Ti-0.3Mo-0.8Ni	Bar, billet	SB-348	12	R53400	Annealed
(23) 23	Ti-0.3Mo-0.8Ni	Forgings	SB-381	F-12	R53400	Annealed
(23) 24	Ti-0.3Mo-0.8Ni	Smls. tube	SB-338	12	R53400	Smls. ann.
(23) 25	Ti-0.3Mo-0.8Ni	Smls. pipe	SB-861	12	R53400	Smls. ann.
(23) 26	Ti-0.3Mo-0.8Ni	Wld. tube	SB-338	12	R53400	Wld. ann.
(23) 27	Ti-0.3Mo-0.8Ni	Wld. pipe	SB-862	12	R53400	Wld. ann.

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Size/ Thickness, in.	P-No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Maximum Use Temperature, °F	External Pressure Chart No.	Notes
1	...	51	50	40	600	NFT-2	G7
2	...	52	65	55	600	NFT-1	...
3	...	52	65	55	600	NFT-1	...
4	...	52	65	55	600	NFT-1	...
5	...	52	65	55	600	NFT-1	...
6	...	52	65	55	600	NFT-1	...
7	...	52	65	55	600	NFT-1	G7
8	...	52	65	55	600	NFT-1	G7
9	...	51	50	40	600	NFT-2	...
10	...	51	50	40	600	NFT-2	...
11	...	51	50	40	600	NFT-2	...
12	...	51	50	40	600	NFT-2	...
13	...	51	50	40	600	NFT-2	...
14	...	51	50	40	600	NFT-2	G7
15	...	51	50	40	600	NFT-2	G7
16	...	51	50	40	600	NFT-2	...
17	...	51	50	40	600	NFT-2	...
18	...	51	50	40	600	NFT-2	...
19	...	51	50	40	600	NFT-2	...
20	...	51	50	40	600	NFT-2	...
21	...	52	70	50	600	NFT-5	...
22	...	52	70	50	600	NFT-5	...
23	...	52	70	50	600	NFT-5	...
24	...	52	70	50	600	NFT-5	...
25	...	52	70	50	600	NFT-5	...
26	...	52	70	50	600	NFT-5	G7
27	...	52	70	50	600	NFT-5	G7

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding																	
Line No.	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
1	17.7	17.7	17.7	16.2	14.5	12.8	11.1	9.6	8.4	7.4	6.8	...	...	...	...	...	...
2	27.1	27.1	27.1	26.5	23.8	21.3	19.1	17.0	15.0	13.2	11.4	...	...	...	...	...	...
3	27.1	27.1	27.1	26.5	23.8	21.3	19.1	17.0	15.0	13.2	11.4	...	...	...	...	...	...
4	27.1	27.1	27.1	26.5	23.8	21.3	19.1	17.0	15.0	13.2	11.4	...	...	...	...	...	...
5	27.1	27.1	27.1	26.5	23.8	21.3	19.1	17.0	15.0	13.2	11.4	...	...	...	...	...	...
6	27.1	27.1	27.1	26.5	23.8	21.3	19.1	17.0	15.0	13.2	11.4	...	...	...	...	...	...
7	23.0	23.0	23.0	22.5	20.3	18.1	16.2	14.4	12.8	11.2	9.7	...	...	...	...	...	...
8	23.0	23.0	23.0	22.5	20.3	18.1	16.2	14.4	12.8	11.2	9.7	...	...	...	...	...	...
9	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
10	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
11	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
12	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
13	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
14	17.7	17.7	17.7	16.2	14.5	12.8	11.1	9.6	8.4	7.4	6.8	...	...	...	...	...	...
15	17.7	17.7	17.7	16.2	14.5	12.8	11.1	9.6	8.4	7.4	6.8	...	...	...	...	...	...
16	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
17	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
18	17.7	17.7	17.7	16.2	14.5	12.8	11.1	9.6	8.4	7.4	6.8	...	...	...	...	...	...
19	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
20	20.8	20.8	20.8	19.1	17.1	15.1	13.1	11.3	9.8	8.7	8.0	...	...	...	...	...	...
21	29.2	29.2	27.8	25.3	23.1	21.3	19.8	18.5	17.3	16.4	16.1	...	...	...	...	...	...
22	29.2	29.2	27.8	25.3	23.1	21.3	19.8	18.5	17.3	16.4	16.1	...	...	...	...	...	...
23	29.2	29.2	27.8	25.3	23.1	21.3	19.8	18.5	17.3	16.4	16.1	...	...	...	...	...	...
24	29.2	29.2	27.8	25.3	23.1	21.3	19.8	18.5	17.3	16.4	16.1	...	...	...	...	...	...
25	29.2	29.2	27.8	25.3	23.1	21.3	19.8	18.5	17.3	16.4	16.1	...	...	...	...	...	...
26	24.8	24.8	23.7	21.5	19.7	18.1	16.9	15.7	14.7	13.9	13.6	...	...	...	...	...	...
27	24.8	24.8	23.7	21.5	19.7	18.1	16.9	15.7	14.7	13.9	13.6	...	...	...	...	...	...

Table 5B (Cont'd)
Section VIII, Division 2, Class 2
Maximum Allowable Stress Values, S, for Nonferrous Materials

Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding															
Line No.	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	(23)

NOTES TO TABLE 5B**GENERAL NOTES**

- (a) The following abbreviations are used: ann., annealed; extr., extruded; fin., finished; rel., relieved; Smls., Seamless; and Wld., Welded.
- (b) An alternative typeface is used for stress values obtained from time-dependent properties (see Notes T1 through T14).
- (c) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SB-407/SB-407M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SB-407 Grade N08800 shall be used when SB-407M Grade N08800 is used in construction.
- (d) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (e) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (f) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - GENERAL REQUIREMENTS

- G1 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed $66\frac{2}{3}\%$ but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction. Table Y-2 lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give allowable stress values that will result in lower levels of permanent strain.
- G2 Use of external pressure charts for material in the form of bar stock is permitted for stiffening rings only.
- G3 Maximum allowable stress values for 100°F may be used at temperatures down to -325°F without additional specification requirements.
- G4 Maximum allowable stress values for 100°F may be used at temperatures down to -452°F without additional specification requirements.
- G5 Maximum temperature for external pressure design not to exceed 350°F.
- G6 These alloys are occasionally subject to the hazard of stress corrosion cracking. Even though they are suitable for engineering use under a wide variety of corrosive conditions, with no particular hazard with respect to stress corrosion, the supplier of the material should be consulted before applying them.
- G7 A joint efficiency factor of 0.85 has been applied in arriving at the maximum allowable stress values for this material.
- G8 For stress relieved tempers (T451, T4510, T4511, T651, T6510, T6511), stress values for materials in the basic temper shall be used.
- G9 Copper-silicon alloys are not always suitable when exposed to certain media and high temperature, particularly steam above 212°F. The user should satisfy him/herself that the alloy selected is satisfactory for the service for which it is to be used.
- G10 At temperatures over 1000°F, these stress values apply only when the carbon is 0.04% or higher.
- G11 This alloy is subject to severe loss of impact strength at room temperatures after exposure in the range of 1000°F to 1400°F.
- G12 Alloy N06022 in the solution annealed condition is subject to severe loss of impact strength at room temperatures after exposure in the range of 1000°F to 1250°F.
- G13 Creep-fatigue, thermal ratcheting, and environmental effects are increasingly significant failure modes at temperatures in excess of 1500°F and shall be considered in the design.

NOTES - HEAT TREATMENT REQUIREMENTS

- H1 For temperatures above 1000°F, these stress values may be used only if the material is annealed at a minimum temperature of 1900°F and has a carbon content of 0.04% or higher.
- H2 For temperatures above 1000°F, these stress values may be used only if the material is heat treated by heating it to a minimum temperature of 1900°F and quenching in water or rapidly cooling by other means.

NOTES - TIME-DEPENDENT PROPERTIES

- T1 Allowable stresses for temperatures of 250°F and above are values obtained from time-dependent properties.
- T2 Allowable stresses for temperatures of 300°F and above are values obtained from time-dependent properties.
- T3 Allowable stresses for temperatures of 350°F and above are values obtained from time-dependent properties.
- T4 Allowable stresses for temperatures of 400°F and above are values obtained from time-dependent properties.
- T5 Allowable stresses for temperatures of 500°F and above are values obtained from time-dependent properties.
- T6 Allowable stresses for temperatures of 700°F and above are values obtained from time-dependent properties.
- T7 Allowable stresses for temperatures of 750°F and above are values obtained from time-dependent properties.
- T8 Allowable stresses for temperatures of 800°F and above are values obtained from time-dependent properties.
- T9 Allowable stresses for temperatures of 850°F and above are values obtained from time-dependent properties.
- T10 Allowable stresses for temperatures of 900°F and above are values obtained from time-dependent properties.
- T11 Allowable stresses for temperatures of 950°F and above are values obtained from time-dependent properties.
- T12 Allowable stresses for temperatures of 1000°F and above are values obtained from time-dependent properties.
- T13 Allowable stresses for temperatures of 1050°F and above are values obtained from time-dependent properties.

NOTES TO TABLE 5B (CONT'D)

NOTES – TIME-DEPENDENT PROPERTIES (CONT'D)

T14 Allowable stresses for temperatures of 1100°F and above are values obtained from time-dependent properties.

NOTES – WELDING REQUIREMENTS

W1 Welding except for seal welds is not permitted.

W2 For welded construction, stress values for material at 0 temper shall be used.

W3 The stress values given for this material are not applicable when either welding or thermal cutting is employed.

W4 Use NFA-12 when welded with 5356 or 5556 filler metal, all thicknesses, or 4043 or 5554 filler metal, thickness $\leq \frac{3}{8}$ in. Use NFA-13 when welded with 4043 or 5554 filler metal, thickness $> \frac{3}{8}$ in.

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Table 6A
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Bar, stay	SA-675	45	...	...	...	1	1
2	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
3	Carbon steel	Sheet	SA-414	A	K01501	...	...	1	1
4	Carbon steel	Wld. pipe & tube	SA-178	A	K01200	...	...	1	1
5	Carbon steel	Smls. pipe & tube	SA-192	...	K01201	...	...	1	1
6	Carbon steel	Smls. pipe & tube	SA-53	A	K02504	...	...	1	1
7	Carbon steel	Wld. pipe & tube	SA-53	A	K02504	...	...	1	1
8	Carbon steel	Butt-wld. pipe	SA-53	F	...	...	...	1	1
9	Carbon steel	Smls. pipe & tube	SA-106	A	K02501	...	...	1	1
10	Carbon steel	Wld. pipe & tube	SA-135	A	...	...	...	1	1
11	Carbon steel	Bar, stay	SA-675	50	...	...	...	1	1
12	Carbon steel	Plate	SA-285	B	K02200	...	...	1	1
13	Carbon steel	Sheet	SA-414	B	K02201	...	...	1	1
14	Carbon steel	Plate	SA/EN 10025-2	S235JR	...	...	$t \leq 4$	1	1
15	Carbon steel	Wld. pipe & tube	SA/EN 10217-1	P235TR2	...	...	$t \leq 1^{9/16}$	1	1
16	Carbon steel	Bar, stay	SA-675	55	...	...	...	1	1
17	Carbon steel	Plate	SA-285	C	K02801	...	...	1	1
18	Carbon steel	Plate	SA-516	55	K01800	...	...	1	1
19	Carbon steel	Sheet	SA-414	C	K02503	...	...	1	1
20	Carbon steel	Plate	SA-36	...	K02600	...	...	1	1
21	Carbon steel	Bar, stay	SA-36	...	K02600	...	...	1	1
22	Carbon steel	Forgings	SA-181	...	K03502	60	...	1	1
23	Carbon steel	Castings	SA-216	WCA	J02502	...	...	1	1
24	Carbon steel	Forgings	SA-266	1	K03506	...	...	1	1
25	Carbon steel	Bar, stay	SA-675	60	...	...	...	1	1
26	Carbon steel	Plate	SA-515	60	K02401	...	...	1	1
27	Carbon steel	Plate	SA-516	60	K02100	...	...	1	1
28	Carbon steel	Smls. pipe & tube	SA-53	B	K03005	...	...	1	1
29	Carbon steel	Wld. pipe & tube	SA-53	B	K03005	...	...	1	1
30	Carbon steel	Smls. pipe & tube	SA-106	B	K03006	...	...	1	1
31	Carbon steel	Wld. pipe & tube	SA-135	B	...	...	...	1	1
32	Carbon steel	Sheet	SA-414	D	K02505	...	...	1	1
33	Carbon steel	Wld. pipe & tube	SA-178	C	K03503	...	...	1	1
34	Carbon steel	Smls. pipe & tube	SA-210	A-1	K02707	...	...	1	1
35	Carbon steel	Bolting	SA-307	B	...	...	...	...	...
36	Carbon steel	Bar, stay	SA-675	65	...	...	...	1	1
37	Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
38	Carbon steel	Plate	SA-516	65	K02403	...	...	1	1
39	Carbon steel	Sheet	SA-414	E	K02704	...	...	1	1
40	Carbon steel	Plate	SA/CSA-G40.21	44W	...	...	...	1	1
41	Carbon steel	Plate	SA/CSA-G40.21	50W	...	...	...	1	1
42	Carbon steel	Bolting	SA-311	1018	...	A	...	...	...
43	Carbon steel	Plate	SA-455	...	K03300	...	$0.58 < t \leq \frac{3}{4}$	1	2
44	Carbon steel	Bar, stay	SA-675	70	...	...	...	1	2
45	Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2

Table 6A
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
					100	150	200	250	300	350	400	450	500	
1	45	22.5	...	...	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
2	45	24	CS-1	...	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
3	45	25	CS-1	...	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
4	47	26	CS-2	G3, G4	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
5	47	26	CS-1	G3	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	
6	48	30	CS-2	G4	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	
7	48	30	CS-2	...	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
8	48	30	CS-2	G5	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	
9	48	30	CS-2	...	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	
10	48	30	CS-2	G4	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
11	50	25	...	...	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
12	50	27	CS-1	...	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
13	50	30	CS-2	...	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
14	52	31	CS-2	...	10.4	...	10.4	...	10.4	...	10.4	...	10.4	
15	52	33	CS-2	G4	8.8	...	8.8	...	8.8	...	8.8	...	8.8	
16	55	27.5	...	...	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	
17	55	30	CS-2	...	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	
18	55	30	CS-2	...	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	
19	55	33	CS-2	...	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	
20	58	36	CS-2	G1, G2	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	
21	58	36	...	G1	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	
22	60	30	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
23	60	30	CS-2	G6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	
24	60	30	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
25	60	30	...	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
26	60	32	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
27	60	32	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
28	60	35	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
29	60	35	CS-2	G4	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	
30	60	35	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
31	60	35	CS-2	G4	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	
32	60	35	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
33	60	37	CS-1	...	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	
34	60	37	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
35	60	...	...	G7	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
36	65	32.5	...	...	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
37	65	35	CS-2	...	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
38	65	35	CS-2	...	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
39	65	38	CS-2	...	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
40	65	44	CS-2	...	13.0	...	13.0	...	13.0	...	13.0	...	13.0	
41	65	50	CS-2	...	13.0	...	13.0	...	13.0	...	13.0	...	13.0	
42	65	55	...	G8, W1, W3	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
43	70	35	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	
44	70	35	...	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	
45	70	36	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	

Table 6A (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Cond./Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2
2	Carbon steel	Castings	SA-216	WCB	J03002	...	...	1	2
3	Carbon steel	Forgings	SA-266	2	K03506	...	...	1	2
4	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2
5	Carbon steel	Plate	SA-516	70	K02700	...	...	1	2
6	Carbon steel	Smls. pipe & tube	SA-106	C	K03501	...	...	1	2
7	Carbon steel	Sheet	SA-414	F	K03102	...	...	1	2
8	Carbon steel	Bolting	SA-311	1018	...	A	...	...	...
9	Carbon steel	Plate	SA-455	...	K03300	...	$\frac{3}{8} < t \leq 0.58$	1	2
10	Carbon steel	Forgings	SA-266	3	K05001	...	...	1	2
11	Carbon steel	Plate	SA-455	...	K03300	...	$t \leq \frac{3}{8}$	1	2
12	Carbon steel	Sheet	SA-414	G	K03103	...	...	1	2
13	Carbon steel	Bolting	SA-311	1035	...	A	...	...	...
14	Carbon steel	Bolting	SA-311	1035	...	A	...	...	...
15	Carbon steel	Bolting	SA-311	1045	...	A	...	...	...
16	Carbon steel	Bolting	SA-311	1045	...	A	...	...	...
17	Carbon steel	Bolting	SA-311	1050	...	A	...	...	...
18	Carbon steel	Bolting	SA-311	1050	...	A	...	...	...
19	Carbon steel	Bolting	SA-325	1	...	...	...	...	...
20	Carbon steel	Bolting	SA-311	1045	...	B	...	...	...
21	Carbon steel	Bolting	SA-354	BC	...	...	...	...	...
22	Carbon steel	Bolting	SA-354	BD	...	...	...	...	...
23	Carbon steel	Bolting	SF-568M	10.9	...	...	...	...	...
24	1Cr-0.2Mo	Bolting	SA-193	B7	G41400	...	...	...	...
25	1Cr-0.2Mo	Bolting	SA-320	L7	...	...	...	...	...
26	5Cr- $\frac{1}{2}$ Mo	Bolting	SA-193	B5	K50100	...	...	...	...
27	18Cr-2Mo	Plate	SA-240	...	S44400	...	$t \leq \frac{3}{8}$	7	2
28	18Cr-2Mo	Tube	SA-268	...	S44400	...	$t \leq \frac{3}{8}$	7	2
29	18Cr-2Mo	Bar	SA-479	CS-2	S44400	...	$t \leq \frac{3}{8}$	7	2
30	18Cr-Ti	Plate	SA-240	439	...	...	$t \leq \frac{3}{8}$	7	2
(23) 31	18Cr-Ti	Plate	SA-240	...	S43932	...	$t \leq \frac{3}{8}$	7	2
32	18Cr-Ti	Tube	SA-268	TP439	S43035	...	$t \leq \frac{3}{8}$	7	2
33	18Cr-Ti	Bar	SA-479	439	S43035	...	$t \leq \frac{3}{8}$	7	2
(23) 34	...	...	...	...	...	...	...	...	...
35	29Cr-4Mo	Smls. tube	SA-268	29-4	S44700	...	...	10J	1
36	29Cr-4Mo	Wld. tube	SA-268	29-4	S44700	...	...	10J	1
37	1 $\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-320	L43	G43400	...	$t \leq 4$	...	...
38	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	...	8	1
39	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...	...	8	1
40	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...	...	8	1
41	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	...	8	1
42	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316L	S31603	...	...	8	1
43	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	...	...	8	1
44	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	...	...	8	1
45	16Cr-12Ni-2Mo	Castings	SA-351	CF3M	J92800	...	$t \geq 0.10$	8	1

Table 6A (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
					100	150	200	250	300	350	400	450	500	
1	70	36	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
2	70	36	CS-2	G6	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
3	70	36	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
4	70	38	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
5	70	38	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
6	70	40	CS-2	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
7	70	42	CS-3	...	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
8	70	60	...	G8, W1, W2	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
9	73	37	CS-2	...	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
10	75	37.5	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
11	75	38	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
12	75	45	CS-3	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
13	80	70	...	G8, W1, W3	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
14	85	75	...	G8, W1, W2	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
15	90	80	...	G8, W1, W3	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
16	95	85	...	G8, W1, W2	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
17	95	85	...	G8, W1, W3	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
18	100	90	...	G8, W1, W2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
19	105	81	...	G7	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2
20	115	100	...	G8, W1, W2	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
21	125	109	...	G7	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
22	150	130	...	G7	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
23	150	...	...	G7	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2
24	100	75	...	G7	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8
25	125	105	...	G7	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
26	100	80	...	G7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
27	60	40	CS-2	...	12.0	12.0	12.0	11.8	11.6	11.5	11.4	11.2	11.1	11.1
28	60	40	CS-2	...	12.0	12.0	12.0	11.8	11.6	11.5	11.4	11.2	11.1	11.1
29	60	45	...	...	12.0	12.0	12.0	11.8	11.6	11.5	11.4	11.2	11.1	11.1
30	60	30	...	G9	12.0	12.0	12.0	11.8	11.6	11.4	11.3	11.2	11.0	11.0
31	60	30	CS-2	G9	12.0	12.0	12.0	11.8	11.6	11.4	11.3	11.2	11.0	11.0
32	60	30	CS-2	G9	12.0	12.0	12.0	11.8	11.6	11.4	11.3	11.2	11.0	11.0
33	70	40	CS-2	G9	14.0	14.0	14.0	13.8	13.5	13.3	13.2	13.0	12.9	12.9
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	80	60	HA-6	G12	15.0	15.0	15.0	14.7	14.5	14.4	14.4	14.4	14.4	14.4
36	80	60	HA-6	G4, G12	12.8	12.8	12.7	12.5	12.3	12.2	12.2	12.2	12.2	12.2
37	125	105	...	G7	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
38	70	25	HA-4	G9, G11	14.0	14.0	13.6	13.1	12.7	12.1	11.7	11.3	10.9	10.9
39	70	25	HA-4	G9, G10, G11	14.0	14.0	13.6	13.1	12.7	12.1	11.7	11.3	10.9	10.9
40	70	25	HA-4	G9	14.0	14.0	13.6	13.1	12.7	12.1	11.7	11.3	10.9	10.9
41	70	25	HA-4	G4, G9, G10, G11	11.9	11.9	11.6	11.2	10.8	10.3	9.9	9.6	9.3	9.3
42	70	25	HA-4	G9, G11	14.0	14.0	13.6	13.1	12.7	12.1	11.7	11.3	10.9	10.9
43	70	25	HA-4	G4, G9, G11	11.9	11.9	11.6	11.2	10.8	10.3	9.9	9.6	9.3	9.3
44	70	25	HA-4	G9, G10	14.0	14.0	13.6	13.1	12.7	12.1	11.7	11.3	10.9	10.9
45	70	30	...	G6, G9	11.2	11.2	11.2	11.0	10.9	10.8	10.8	10.7	10.7	10.7

Table 6A (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Cond./Temper	Size/Thickness, in.	P-No.	Group No.
1	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	...	8	1
2	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...	...	8	1
3	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...	...	8	1
4	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	8	1
5	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316	S31600	...	...	8	1
6	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	...	...	8	1
7	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	...	...	8	1
(23) 8	16Cr-12Ni-2Mo-Ti	Smls. tube	SA-213	TP316Ti	S31635	...	...	8	1
(23) 9	16Cr-12Ni-2Mo-Ti	Plate	SA-240	316Ti	S31635	...	...	8	1
(23) 10	16Cr-12Ni-2Mo-Ti	Smls. pipe	SA-312	TP316Ti	S31635	...	...	8	1
(23) 11	16Cr-12Ni-2Mo-Ti	Wld. pipe	SA-312	TP316Ti	S31635	...	...	8	1
12	16Cr-12Ni-2Mo-Ti	Plate	SA/EN 10088-2	X6CrNiMoTi17-12-2	...	...	$t \leq \frac{5}{16}$	8	1
13	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	$t \leq 5$	8	1
14	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...	...	8	1
15	18Cr-8Ni	Plate	SA-240	304L	S30403	...	...	8	1
16	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	8	1
17	18Cr-8Ni	Smls. pipe	SA-312	TP304L	S30403	...	...	8	1
18	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	...	...	8	1
19	18Cr-8Ni	Bar	SA-479	304L	S30403	...	...	8	1
20	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	$t \leq 5$	8	1
21	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...	...	8	1
22	18Cr-8Ni	Plate	SA-240	304	S30400	...	...	8	1
23	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	8	1
24	18Cr-8Ni	Smls. pipe	SA-312	TP304	S30400	...	...	8	1
25	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	...	...	8	1
26	18Cr-8Ni	Bar	SA-479	304	S30400	...	...	8	1
27	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710	...	$t \geq 0.10$	8	1
28	...	Plate	SA/EN 10088-2	X6CrNiMoTi17-12-2	...	...	$t < \frac{5}{16}$	8	1
29	20Cr-10Ni	Bar	SA-479	ER308	S30880	...	...	...	...
(23) 30	21Cr-5Mn-1.5Ni-Cu-N	Plate	SA-240	...	S32101	...	$t > \frac{3}{16}$	10H	1
(23) 31	21Cr-5Mn-1.5Ni-Cu-N	Smls. tube	SA-789	...	S32101	...	$t > \frac{3}{16}$	10H	1
(23) 32	21Cr-5Mn-1.5Ni-Cu-N	Wld. tube	SA-789	...	S32101	...	$t > \frac{3}{16}$	10H	1
(23) 33	21Cr-5Mn-1.5Ni-Cu-N	Smls. pipe	SA-790	...	S32101	...	$t > \frac{3}{16}$	10H	1
(23) 34	21Cr-5Mn-1.5Ni-Cu-N	Wld. pipe	SA-790	...	S32101	...	$t > \frac{3}{16}$	10H	1
(23) 35	21Cr-5Mn-1.5Ni-Cu-N	Plate	SA-240	...	S32101	...	$t \leq \frac{3}{16}$	10H	1
(23) 36	21Cr-5Mn-1.5Ni-Cu-N	Smls. tube	SA-789	...	S32101	...	$t \leq \frac{3}{16}$	10H	1
(23) 37	21Cr-5Mn-1.5Ni-Cu-N	Wld. tube	SA-789	...	S32101	...	$t \leq \frac{3}{16}$	10H	1
(23) 38	21Cr-5Mn-1.5Ni-Cu-N	Smls. pipe	SA-790	...	S32101	...	$t \leq \frac{3}{16}$	10H	1
(23) 39	21Cr-5Mn-1.5Ni-Cu-N	Wld. pipe	SA-790	...	S32101	...	$t \leq \frac{3}{16}$	10H	1
40	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...	...	10H	1
41	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S31803	...	...	10H	1
42	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S31803	...	...	10H	1
43	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S31803	...	...	10H	1
44	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S31803	...	...	10H	1
45	23Cr-12Ni	Bar	SA-479	309S	S30908	...	...	8	2

Table 6A (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
					100	150	200	250	300	350	400	450	500	
1	75	30	HA-2	G9, G11	15.0	15.0	15.0	14.8	14.6	14.4	14.3	13.8	13.3	
2	75	30	HA-2	G9, G10, G11	15.0	15.0	15.0	14.8	14.6	14.4	14.3	13.8	13.3	
3	75	30	HA-2	G9	15.0	15.0	15.0	14.8	14.6	14.4	14.3	13.8	13.3	
4	75	30	HA-2	G4, G9, G10, G11	12.8	12.8	12.8	12.6	12.4	12.3	12.1	11.7	11.3	
5	75	30	HA-2	G9, G11	15.0	15.0	15.0	14.8	14.6	14.4	14.3	13.8	13.3	
6	75	30	HA-2	G4, G9, G11	12.8	12.8	12.8	12.6	12.4	12.3	12.1	11.7	11.3	
7	75	30	HA-2	G7, G9, G13	15.0	15.0	15.0	14.8	14.6	14.4	14.3	13.8	13.3	
8	75	30	HA-2	G9	15.0	14.8	14.0	13.3	12.7	12.3	12.1	11.9	11.8	
9	75	30	HA-2	G9	15.0	14.8	14.0	13.3	12.7	12.3	12.1	11.9	11.8	
10	75	30	HA-2	G9	15.0	14.8	14.0	13.3	12.7	12.3	12.1	11.9	11.8	
11	75	30	HA-2	G4, G9	12.7	12.6	11.9	11.3	10.8	10.5	10.3	10.1	10.0	
12	78.5	35	HA-2	G14	15.7	...	15.7	...	15.3	...	15.0	...	15.0	
13	70	25	HA-3	G9, G11	14.0	13.9	13.2	12.7	12.2	12.0	11.7	11.3	10.9	
14	70	25	HA-3	G9, G10, G11	14.0	13.9	13.2	12.7	12.2	12.0	11.7	11.3	10.9	
15	70	25	HA-3	G9	14.0	13.9	13.2	12.7	12.2	12.0	11.7	11.3	10.9	
16	70	25	HA-3	G4, G9, G10, G11	11.9	11.8	11.2	10.8	10.4	10.2	9.9	9.6	9.3	
17	70	25	HA-3	G9, G11	14.0	13.9	13.2	12.7	12.2	12.0	11.7	11.3	10.9	
18	70	25	HA-3	G4, G9, G11	11.9	11.8	11.2	10.8	10.4	10.2	9.9	9.6	9.3	
19	70	25	HA-3	G9, G10	14.0	13.9	13.2	12.7	12.2	12.0	11.7	11.3	10.9	
20	75	30	HA-1	G9, G11	15.0	15.0	14.2	13.6	13.2	13.0	12.8	12.7	12.7	
21	75	30	HA-1	G9, G10, G11	15.0	15.0	14.2	13.6	13.2	13.0	12.8	12.7	12.7	
22	75	30	HA-1	G9	15.0	15.0	14.2	13.6	13.2	13.0	12.8	12.7	12.7	
23	75	30	HA-1	G4, G9, G10, G11	12.8	12.7	12.1	11.6	11.3	11.0	10.9	10.8	10.8	
24	75	30	HA-1	G9, G11	15.0	15.0	14.2	13.6	13.2	13.0	12.8	12.7	12.7	
25	75	30	HA-1	G4, G9, G11	12.8	12.7	12.1	11.6	11.3	11.0	10.9	10.8	10.8	
26	75	30	HA-1	G7, G9, G13	15.0	15.0	14.2	13.6	13.2	13.0	12.8	12.7	12.7	
27	70	30	...	G6, G9	11.2	11.2	10.7	10.2	9.8	9.5	9.3	9.1	9.0	
28	78.5	35	HA-2	G14	15.7	...	15.7	...	15.3	...	15.0	...	15.0	
29	75	30	HA-2	G7, G9, G13	15.0	15.0	14.2	13.6	13.2	13.0	12.8	12.7	12.7	
30	94	65	HA-5	...	18.8	18.8	18.8	18.5	17.9	17.5	17.3	17.2	17.2	
31	94	65	HA-5	...	18.8	18.8	18.8	18.5	17.9	17.5	17.3	17.2	17.2	
32	94	65	HA-5	...	16.0	16.0	16.0	15.7	15.2	14.9	14.7	14.6	14.6	
33	94	65	HA-5	...	18.8	18.8	18.8	18.5	17.9	17.5	17.3	17.2	17.2	
34	94	65	HA-5	...	16.0	16.0	16.0	15.7	15.2	14.9	14.7	14.6	14.6	
35	101	77	HA-5	...	20.2	20.2	20.2	19.8	19.3	18.8	18.6	18.5	18.5	
36	101	77	HA-5	...	20.2	20.2	20.2	19.8	19.3	18.8	18.6	18.5	18.5	
37	101	77	HA-5	...	17.2	17.2	17.2	16.9	16.4	16.0	15.8	15.7	15.7	
38	101	77	HA-5	...	20.2	20.2	20.2	19.8	19.3	18.8	18.6	18.5	18.5	
39	101	77	HA-5	...	17.2	17.2	17.2	16.9	16.4	16.0	15.8	15.7	15.7	
40	90	65	HA-5	...	18.0	18.0	18.0	...	17.4	...	16.7	...	16.3	
41	90	65	HA-5	...	18.0	18.0	18.0	...	17.4	...	16.7	...	16.3	
42	90	65	HA-5	...	15.3	15.3	15.3	...	14.8	...	14.2	...	13.9	
43	90	65	HA-5	...	18.0	18.0	18.0	...	17.4	...	16.7	...	16.3	
44	90	65	HA-5	...	15.3	15.3	15.3	...	14.8	...	14.2	...	13.9	
45	75	30	HA-2	G7, G9, G13	15.0	15.0	15.0	15.0	14.9	14.8	14.6	14.5	14.3	

Table 6A (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	23Cr-12Ni	Bar	SA-479	309H	S30909	...	...	8	2
2	25Cr-20Ni	Bar	SA-479	310S	S31008	...	...	8	2
3	44Fe-25Ni-21Cr-Mo	Plate	SA-240	904L	N08904	...	...	45	...

Table 6A (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Ferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	75	30	HA-2	G7, G9, G13	15.0	15.0	15.0	15.0	14.9	14.8	14.6	14.5	14.3
2	75	30	HA-2	G7, G9, G13	15.0	15.0	15.0	15.0	14.9	14.8	14.6	14.5	14.3
3	71	31	NFN-9	...	14.2	14.2	14.2	13.9	13.6	13.3	13.1	12.9	12.7

NOTES TO TABLE 6A**GENERAL NOTES**

- (a) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (b) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.
- (c) The following abbreviations are used: Smls., Seamless; and Wld., Welded.

NOTES – GENERAL REQUIREMENTS

- G1 These allowable stress values also apply to structural shapes.
- G2 SA/CSA-G40.21 as specified in ASME BPVC, Section II, Part A, grade 38W, may be used in lieu of SA-36 for plates and bars not exceeding $\frac{3}{4}$ in.
- G3 Tensile value is expected minimum.
- G4 The stress value includes a joint factor of 0.85.
- G5 The stress value includes a joint factor of 0.60.
- G6 The stress value includes a casting quality factor of 0.80. Increased casting quality factors as a result of material examination beyond the requirements of the material specifications shall not be permitted.
- G7 The stress value is established from a consideration of strength only and will be satisfactory for average service. For bolted joints, where freedom from leakage over a long period of time without retightening is required, lower stress values may be necessary, as determined from the relative flexibility of the flange and bolts, and corresponding relaxation properties.
- G8 For tie-rods and draw bolts on cast-iron sectional boilers subject to system pressure.
- G9 The water temperature shall not exceed 210°F.
- G10 Tubing material shall be fully annealed.
- G11 The limitations of ASME BPVC, Section IV, HF-204.2 and HF-204.3 apply.
- G12 Heat treatment after forming or fabrication is neither required nor prohibited.
- G13 For arc or resistance welded studs only.
- G14 For cold-rolled strips only.

NOTES – WELDING REQUIREMENTS

- W1 Welding or brazing is not permitted.
- W2 For tie-rods and draw bolts up to $\frac{7}{8}$ in. diameter subject to system pressure, welding is not permitted.
- W3 For tie-rods and draw bolts over $\frac{7}{8}$ in. diameter up to $1\frac{1}{4}$ in. diameter subject to system pressure, welding is not permitted.

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Table 6B
Section IV Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.
1	...	Castings	SB-26	...	A13560	T6	...	...
2	...	Smls. extr. tube	SB-241	...	A91100	O	...	21
3	...	Drawn smls. tube	SB-210	...	A93003	O	...	21
4	...	Plate, sheet	SB-209	...	A95052	H32 wld.	...	22
5	...	Drawn smls. tube	SB-210	...	A95052	H32 wld.	...	22
6	...	Smls. extr. tube	SB-241	...	A95052	H32 wld.	...	22
7	...	Plate, sheet	SB-209	...	A96061	T6 wld.	...	23
8	...	Plate, sheet	SB-209	...	A96061	T651 wld.	...	23
9	...	Drawn smls. tube	SB-210	...	A96061	T6	...	23
10	...	Drawn smls. tube	SB-210	...	A96061	T6 wld.	...	23
11	...	Bar, rod, wire	SB-211	...	A96061	T6 wld.	...	23
12	...	Bar, rod, wire	SB-211	...	A96061	T651 wld.	...	23
13	...	Bar, rod, shapes	SB-221	...	A96061	T6 wld.	...	23
14	...	Smls. extr. tube	SB-241	...	A96061	T6 wld.	...	23
15	...	Smls. extr. tube	SB-241	...	A96063	O	...	23
16	...	Bar, rod, shapes	SB-221	...	A96063	T5	$t > \frac{1}{2}$	23
17	...	Bar, rod, shapes	SB-221	...	A96063	T5	$t \leq \frac{1}{2}$	23
18	...	Bar, rod, shapes	SB-221	...	A96063	T6	...	23
(23) 19	...	Castings	SB/EN 1706	...	AC-42000	F	...	...
(23) 20	...	Castings	SB/EN 1706	...	AC-43000	F	...	...
(23) 21	...	Castings	SB/EN 1706	...	AC-44300	F	...	...
(23) 22	...	Smls. tube	SB-75	...	C10200	O50	All	31
23	...	Smls. tube	SB-75	...	C10200	O60	All	31
24	...	Smls. pipe	SB-42	...	C10200	O61	All	31
25	...	Plate, sheet, strip	SB-152	...	C10200	O25	...	31
26	...	Smls. pipe	SB-42	...	C10200	H55	$2 < \text{NPS} \leq 12$	31
27	...	Smls. tube	SB-75	...	C10200	H55	All	31
28	...	Smls. cond. tube	SB-111	...	C10200	H55	...	31
29	...	Smls. U-bend tube	SB-395	...	C10200	H55	...	31
30	...	Smls. pipe	SB-42	...	C10200	H80	$\frac{1}{8} < \text{NPS} \leq 2$	31
31	...	Smls. tube	SB-75	...	C10200	H80	$t < 4$	31
32	...	Smls. cond. tube	SB-111	...	C10200	H80	...	31
33	...	Plate, sheet, strip	SB-152	...	C10400	O25	...	31
34	...	Plate, sheet, strip	SB-152	...	C10500	O25	...	31
35	...	Plate, sheet, strip	SB-152	...	C10700	O25	...	31
36	...	Plate, sheet, strip	SB-152	...	C11000	O25	...	31
(23) 37	...	Smls. tube	SB-75	...	C12000	O50	All	31
38	...	Smls. tube	SB-75	...	C12000	O60	All	31
39	...	Smls. pipe	SB-42	...	C12000	O61	All	31
40	...	Smls. pipe	SB-42	...	C12000	H55	$2 < \text{NPS} \leq 12$	31
41	...	Smls. tube	SB-75	...	C12000	H55	All	31
42	...	Smls. cond. tube	SB-111	...	C12000	H55	...	31
43	...	Smls. U-bend tube	SB-395	...	C12000	H55	...	31
44	...	Smls. pipe	SB-42	...	C12000	H80	$\frac{1}{8} < \text{NPS} \leq 2$	31
45	...	Smls. tube	SB-75	...	C12000	H80	$t < 4$	31

Table 6B
Section IV Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	34	24	...	G6, W1	5.4	5.4	5.4	5.4	...	...	...	...	...
2	11	3	NFA-7	...	2.0	2.0	2.0	1.9	1.6	...	...	...	...
3	14	5	NFA-1	...	2.8	2.8	2.6	2.3	2.1	...	...	...	...
4	25	9.5	NFA-8	...	5.0	5.0	5.0	5.0	4.8	...	...	...	...
5	25	10	NFA-12	...	5.0	5.0	5.0	5.0	4.8	...	...	...	...
6	25	10	NFA-8	...	5.0	5.0	5.0	5.0	4.8	...	...	...	...
7	24	11	NFA-12	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
8	24	11	NFA-12,13	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
9	42	35	NFA-12,13	W1	8.4	8.4	8.4	8.2	7.0	...	...	...	...
10	24	11	NFA-12,13	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
11	24	11	NFA-12	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
12	24	11	NFA-12,13	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
13	24	11	NFA-12,13	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
14	24	11	NFA-12,13	...	4.8	4.8	4.8	4.7	4.5	...	...	...	...
15	16	5	NFA-1	...	3.2	3.2	3.2	3.0	2.8	...	...	...	...
16	21	15	NFA-1	W1	4.2	4.2	4.1	3.9	3.5	...	...	...	...
17	22	16	NFA-1	W1	4.4	4.4	4.3	4.1	3.6	...	...	...	...
18	30	25	NFA-1	...	6.0	6.0	6.0	5.3	4.1	...	...	...	...
19	20.3	11.6	...	G9	1.6	1.6	1.6	1.6	1.5	...	...	...	...
20	21.8	11.6	...	G6	3.5	3.5	3.5	3.5	3.5	...	...	...	...
21	34.8	18.9	...	G8, W1	3.5	3.5	3.1	3.1	3.1	...	...	...	...
22	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
23	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
24	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
25	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
26	36	30	NFC-3	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
27	36	30	NFC-3	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
28	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
29	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
30	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
31	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
32	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
33	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
34	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
35	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
36	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
37	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
38	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
39	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
40	36	30	NFC-3	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
41	36	30	NFC-3	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
42	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
43	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
44	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
45	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...

Table 6B (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.
(23) 1	...	Smls. cond. tube	SB-111	...	C12000	H80	...	31
2	...	Finned tube	SB-359	...	C12200	O62	...	31
3	...	Smls. tube	SB-75	...	C12200	O60	All	31
4	...	Smls. tube	SB-75	...	C12200	O50	All	31
5	...	Smls. pipe	SB-42	...	C12200	O61	All	31
6	...	Finned tube	SB-359	...	C12200	O61	...	31
7	...	Plate, sheet, strip	SB-152	...	C12200	O25	...	31
8	...	Smls. pipe	SB-42	...	C12200	H55	2 < NPS ≤ 12	31
9	...	Smls. tube	SB-75	...	C12200	H55	All	31
10	...	Smls. cond. tube	SB-111	...	C12200	H55	...	31
11	...	Finned tube	SB-359	...	C12200	H55	...	31
12	...	Smls. U-bend tube	SB-395	...	C12200	H55	...	31
13	...	Smls. pipe	SB-42	...	C12200	H80	$\frac{1}{8} < NPS \leq 2$	31
14	...	Smls. tube	SB-75	...	C12200	H80	$t < 4$	31
15	...	Smls. cond. tube	SB-111	...	C12200	H80	...	31
16	...	Plate, sheet, strip	SB-152	...	C12300	O25	...	31
17	...	Plate, sheet, strip	SB-152	...	C14200	O25	...	31
18	...	Smls. cond. tube	SB-111	...	C14200	H55	...	31
19	...	Smls. U-bend tube	SB-395	...	C14200	H55	...	31
20	...	Smls. cond. tube	SB-111	...	C14200	H80	...	31
21	...	Smls. tube	SB-43	...	C23000	O61	...	32
22	...	Smls. cond. tube	SB-111	...	C23000	O61	...	32
23	...	Smls. U-bend tube	SB-395	...	C23000	O61	...	32
(23) 24	...	Forgings	SB-283	...	C37700	M10, M11	$t > 1\frac{1}{2}$	...
(23) 25	...	Forgings	SB-283	...	C37700	M10, M11	$\leq 1\frac{1}{2}$	...
26	...	Plate	SB-171	...	C44300	M20, O25	$t \leq 4$	32
27	...	Finned tube	SB-359	...	C44300	O61	...	32
28	...	Smls. U-bend tube	SB-395	...	C44300	O61	...	32
29	...	Plate	SB-171	...	C44400	M20, O25	$t \leq 4$	32
30	...	Finned tube	SB-359	...	C44400	O61	...	32
31	...	Smls. U-bend tube	SB-395	...	C44400	O61	...	32
32	...	Plate	SB-171	...	C44500	M20, O25	$t \leq 4$	32
33	...	Finned tube	SB-359	...	C44500	O61	...	32
34	...	Smls. U-bend tube	SB-395	...	C44500	O61	...	32
35	...	Plate	SB-171	...	C46400	M20, O25	$t \leq 3$	32
36	...	Smls. cond. tube	SB-111	...	C60800	O61	...	35
37	...	Bar, rod	SB-98	...	C65100	O60	All	33
38	...	Bar, rod	SB-98	...	C65100	H02	$t \leq 2$	33
39	...	Smls. pipe & tube	SB-315	...	C65500	O61	...	33
40	...	Plate, sheet	SB-96	...	C65500	O61	$t \leq 2$	33
41	...	Bar, rod	SB-98	...	C65500	O60	All	33
42	...	Rod	SB-98	...	C65500	H01	...	33
(23) 43	...	Smls. pipe & tube	SB-466	...	C70600	O60	...	34
(23) 44	...	Plate	SB-171	...	C70600	M20, O25	$t \leq 5$	34
(23) 45	...	Smls. cond. tube	SB-111	...	C70600	O61	...	34

Table 6B (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	45	40	NFC-4	G1	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
2	30	6.5	NFC-1	G1	4.3	3.8	3.8	3.8	3.8	...	...	...	...
3	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
4	30	9	NFC-7	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
5	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
6	30	9	NFC-1	G1	6.0	5.3	5.3	5.3	5.3	...	...	...	...
7	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
8	36	30	NFC-3	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
9	36	30	NFC-3	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
10	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
11	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.1	7.0	6.8	6.6	...	...
12	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
13	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
14	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
15	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
16	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
17	30	10	NFC-1	G1	6.0	5.9	5.9	5.7	5.4	...	...	...	...
18	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
19	36	30	NFC-6	G1, G2	7.2	7.2	7.2	7.2	7.0	6.8	6.6	...	...
20	45	40	NFC-4	G1, G2	9.0	9.0	9.0	9.0	8.8	8.3	...	...	...
21	40	12	NFC-2	...	8.0	8.0	8.0	8.0	8.0	...	...	...	...
22	40	12	NFC-2	...	8.0	8.0	8.0	8.0	8.0	...	...	...	...
23	40	12	NFC-2	...	8.0	8.0	8.0	8.0	8.0	...	...	...	...
24	46	15	...	G3, W1	9.2	8.3	8.3	...	...	...	...	...	...
25	50	18	...	G3, W1	10.0	10.0	9.8	...	...	...	...	...	...
26	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
27	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
28	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
29	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
30	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
31	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
32	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
33	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
34	45	15	NFC-2	...	9.0	9.0	9.0	8.9	8.8	8.6	...	...	...
35	50	20	NFC-2	...	10.0	10.0	10.0	10.0	10.0	...	...	...	...
36	50	19	NFC-2	...	10.0	10.0	10.0	10.0	10.0	9.9	...	...	...
37	40	12	...	G4	8.0	7.9	7.9	7.8	7.8	7.7	...	...	...
38	55	20	...	G2, G4	11.0	11.0	11.0	11.0	11.0	11.0	...	...	...
39	50	15	NFC-2	G4	10.0	10.0	9.9	9.9	9.9	9.8	...	...	...
40	50	18	NFC-2	G4	10.0	10.0	10.0	10.0	10.0	9.8	...	...	...
41	52	15	...	G4	10.4	10.4	10.4	10.4	10.4	10.2	...	...	...
42	55	24	...	G2, G4	11.0	11.0	11.0	11.0	11.0	11.0	...	...	...
43	38	13	NFC-3	...	7.6	7.6	7.6	7.6	7.6	7.5	7.2	7.0	6.8
44	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
45	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2

Table 6B (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.
(23) 1	...	Finned tube	SB-359	...	C70600	O61	...	34
(23) 2	...	Smls. U-bend tube	SB-395	...	C70600	O61	...	34
(23) 3	...	Wld. tube	SB-543	...	C70600	W061	...	34
(23) 4	...	Smls. pipe & tube	SB-466	...	C70620	O60	...	34
(23) 5	...	Plate	SB-171	...	C70620	M20, O25	$t \leq 5$	34
(23) 6	...	Smls. cond. tube	SB-111	...	C70620	O61	...	34
(23) 7	...	Finned tube	SB-359	...	C70620	O61	...	34
(23) 8	...	Smls. U-bend tube	SB-395	...	C70620	O61	...	34
(23) 9	...	Wld. tube	SB-543	...	C70620	W061	...	34
(23) 10	...	Smls. tube	SB-466	...	C71000	O60	...	34
11	...	Smls. cond. tube	SB-111	...	C71000	O61	...	34
12	...	Smls. U-bend tube	SB-395	...	C71000	O61	...	34
(23) 13	...	Plate	SB-171	...	C71500	M20, O25	$t \leq 2\frac{1}{2}$	34
14	...	Smls. pipe & tube	SB-466	...	C71500	O60	...	34
15	...	Smls. cond. tube	SB-111	...	C71500	O61	...	34
16	...	Smls. U-bend tube	SB-395	...	C71500	O61	...	34
(23) 17	...	Plate	SB-171	...	C71520	M20, O25	$t \leq 2\frac{1}{2}$	34
(23) 18	...	Smls. pipe & tube	SB-466	...	C71520	O60	...	34
(23) 19	...	Smls. cond. tube	SB-111	...	C71520	O61	...	34
(23) 20	...	Smls. U-bend tube	SB-395	...	C71520	O61	...	34
21	...	Castings	SB-62	...	C83600	...	...	...
22	...	Castings	SB-584	...	C84400	...	...	...
23	...	Castings	SB-584	...	C90300	...	...	...
24	...	Castings	SB-61	...	C92200	...	...	...
25	67Ni-30Cu	Bar	SB-164	...	N04400	Annealed	...	42
26	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed	>5 O.D.	42
27	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed	≤ 5 O.D.	42
28	67Ni-30Cu	Rod	SB-164	...	N04400	Hot worked	...	42
29	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Stress rel.	...	42
30	57Ni-22Cr-14W-2Mo-La	Smls. & wld. fittings	SB-366	...	N06230	Solution ann.	...	43
31	57Ni-22Cr-14W-2Mo-La	Plate, sheet, strip	SB-435	...	N06230	Solution ann.	...	43
32	57Ni-22Cr-14W-2Mo-La	Forgings	SB-564	...	N06230	Solution ann.	...	43
33	57Ni-22Cr-14W-2Mo-La	Bar	SB-572	...	N06230	Solution ann.	...	43
34	57Ni-22Cr-14W-2Mo-La	Wld. pipe	SB-619	...	N06230	Solution ann.	...	43
35	57Ni-22Cr-14W-2Mo-La	Smls. pipe & tube	SB-622	...	N06230	Solution ann.	...	43
36	57Ni-22Cr-14W-2Mo-La	Wld. tube	SB-626	...	N06230	Solution ann.	...	43
37	33Ni-42Fe-21Cr	Plate	SB-409	...	N08800	Annealed	...	45
38	33Ni-42Fe-21Cr	Plate	SB-409	...	N08810	Annealed	...	45

Table 6B (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Nonferrous Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
2	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
3	40	15	NFC-3	...	6.8	6.8	6.8	6.8	6.8	6.7	6.4	6.3	6.1
4	38	13	NFC-3	...	7.6	7.6	7.6	7.6	7.6	7.5	7.2	7.0	6.8
5	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
6	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
7	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
8	40	15	NFC-3	...	8.0	8.0	8.0	8.0	8.0	7.8	7.6	7.4	7.2
9	40	15	NFC-3	...	6.8	6.8	6.8	6.8	6.8	6.7	6.4	6.3	6.1
10	45	16	NFC-3	...	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
11	45	16	NFC-3	...	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
12	45	16	NFC-3	...	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
13	50	20	NFC-4	...	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
14	52	18	NFC-4	...	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.1	9.9
15	52	18	NFC-4	...	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.1	9.9
16	52	18	NFC-4	...	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.1	9.9
17	50	20	NFC-4	...	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
18	52	18	NFC-4	...	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.1	9.9
19	52	18	NFC-4	...	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.1	9.9
20	52	18	NFC-4	...	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.1	9.9
21	30	14	NFC-1	G6	4.8	4.8	4.8	4.8	4.8	4.6	4.6	4.5	4.4
22	29	13	...	G6	4.6	4.6	4.6	4.5	4.3	4.1	4.0	...	...
23	40	18	...	G6	6.4	6.4	6.4	6.4	6.4	6.4	6.4	...	...
24	34	16	NFN-1	G6	5.4	5.4	5.4	5.4	5.4	5.4	4.7	...	...
25	70	25	NFN-3	G5	14.0	14.0	14.0	14.0	13.6	13.3	13.2	13.1	13.1
26	70	25	NFN-3	G5	14.0	14.0	14.0	14.0	13.6	13.3	13.2	13.1	13.1
27	70	28	NFN-3	G5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
28	80	40	NFN-3	G5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
29	85	55	NFN-3	G5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
30	110	45	NFN-24	...	22.0	22.0	22.0	22.0	22.0	21.9	21.5	21.2	21.0
31	110	45	NFN-24	...	22.0	22.0	22.0	22.0	22.0	21.9	21.5	21.2	21.0
32	110	45	NFN-24	...	22.0	22.0	22.0	22.0	22.0	21.9	21.5	21.2	21.0
33	110	45	NFN-24	...	22.0	22.0	22.0	22.0	22.0	21.9	21.5	21.2	21.0
34	110	45	NFN-24	...	18.7	18.7	18.7	18.7	18.7	18.6	18.3	18.0	17.9
35	110	45	NFN-24	...	22.0	22.0	22.0	22.0	22.0	21.9	21.5	21.2	21.0
36	110	45	NFN-24	...	18.7	18.7	18.7	18.7	18.7	18.6	18.3	18.0	17.9
37	75	30	NFN-8	G7	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.9
38	65	25	NFN-9	G7	13.0	13.0	13.0	13.0	13.0	13.0	12.9	12.8	12.8

NOTES TO TABLE 6B**GENERAL NOTES**

- (a) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (b) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.
- (c) The following abbreviations are used: cond., condenser; extr., extruded; Smls., Seamless; and Wld., Welded.

NOTES – GENERAL REQUIREMENTS

- G1 When material is to be welded, the phosphorous deoxidized types should be specified.
- G2 When nonferrous materials conforming to Section II specifications are used in welded or brazed construction, the maximum allowable working stresses shall not exceed the values given herein for the material in the annealed condition.
- G3 For use in ASME BPVC, Section IV, eq. HG-307.2(b)(2), the maximum allowable stress at room temperature (100°F max.) shall be 10.0 ksi through 1½ in. thickness and 9.2 ksi over 1½ in. thickness.
- G4 Copper-silicon alloys are not always suitable when exposed to certain median and high temperatures, particularly steam above 212°F. Therefore, this material is limited to the construction of hot water boilers to be operated at a temperature not to exceed 200°F.
- G5 To be used for HLW connections only.
- G6 The stress value includes a casting quality factor of 0.8. Increased casting quality factors as a result of material examination beyond the requirement of the material specification shall not be permitted. This is not intended to apply to valves and fittings made to recognized standards.
- G7 The maximum water temperature shall not exceed 210°F.
- G8 The castings shall not be repaired.
- G9 When proof testing is required to establish design pressure, that testing shall comply with ASME BPVC, Section IV, HG-501 and HG-502.3, except that in the equation in HG-502.3, the design factor shall be 10 in lieu of 5.

NOTES – WELDING REQUIREMENTS

- W1 Welding or brazing is not permitted.

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Table 6C
Section IV Maximum Allowable Stress Values, S, for Lined Water Heater Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Cond./Temper	Size/Thickness, in.	P-No.	Group No.
1	Carbon steel	Castings	SA-278	20	...	...	...	...	...
2	Carbon steel	Castings	SA-278	25	...	...	...	...	...
3	Carbon steel	Castings	SA-278	30	...	...	...	...	...
4	Carbon steel	Castings	SA-278	35	...	...	...	...	...
5	Carbon steel	Castings	SA-278	40	...	...	...	...	...
6	Carbon steel	Wld. tube	SA-513	1008	...	...	...	1	1
7	Carbon steel	Bar	SA-675	45	...	...	...	1	1
8	Carbon steel	Plate	SA-285	A	K01700	...	...	1	1
9	Carbon steel	Plate	SA-285 AISI C-1012	...	...	...	...	1	1
10	Carbon steel	Sheet	SA-414	A	K01501	...	...	1	1
11	Carbon steel	Sheet	SA-414 AISI C-1012	...	...	...	...	1	1
12	Carbon steel	Wld. tube	SA-513	1010	...	...	...	1	1
13	Carbon steel	Wld. tube	SA-178	E/A	K01200	...	...	1	1
14	Carbon steel	Smls. pipe	SA-53	A	K02504	...	...	1	1
15	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	...	1	1
16	Carbon steel	Smls. pipe	SA-106	A	K02501	...	...	1	1
17	Carbon steel	Wld. pipe	SA-135	E/A	...	...	...	1	1
18	Carbon steel	Wld. tube	SA-513	1015	...	...	...	1	1
19	Carbon steel	Bar	SA-675	50	...	...	...	1	1
20	Carbon steel	Plate	SA-285	B	K02200	...	...	1	1
21	Carbon steel	Plate	SA-285 AISI C-1015d	...	...	...	...	1	1
22	Carbon steel	Sheet	SA-414	B	K02201	...	...	1	1
23	Carbon steel	Sheet	SA-414 AISI C-1015d	...	...	...	...	1	1
24	Carbon steel	Bar	SA-675	55	...	...	...	1	1
25	Carbon steel	Plate	SA-285	C	K02801	...	...	1	1
26	Carbon steel	Plate	SA-516	55	K01800	...	...	1	1
27	Carbon steel	Plate	SA-285 AISI C-1023	...	...	...	...	1	1
28	Carbon steel	Sheet	SA-414	C	K02503	...	...	1	1
29	Carbon steel	Sheet	SA-414 AISI C-1023	...	...	...	...	1	1
30	Carbon steel	Plate	SA-36	...	K02600	...	...	1	1
31	Carbon steel	Bar, shapes	SA-36	...	K02600	...	...	1	1
32	Carbon steel	Forgings	SA-181	...	K03502	60	...	1	1
33	Carbon steel	Bar	SA-675	60	...	...	...	1	1
34	Carbon steel	Plate	SA-515	60	K02401	...	...	1	1
35	Carbon steel	Plate	SA-516	60	K02100	...	...	1	1
36	Carbon steel	Smls. pipe	SA-53	B	K03005	...	...	1	1
37	Carbon steel	Wld. pipe	SA-53	E/B	K03005	...	...	1	1
38	Carbon steel	Smls. pipe	SA-106	B	K03006	...	...	1	1
39	Carbon steel	Wld. pipe	SA-135	E/B	...	...	...	1	1
40	Carbon steel	Sheet	SA-414	D	K02505	...	...	1	1
41	Carbon steel	Plate	SA/CSA-G40.21	38W	...	...	...	1	1
42	Carbon steel	Wld. tube	SA-178	E/C	K03503	...	...	1	1
43	Carbon steel	Bar	SA-675	65	...	...	...	1	1
44	Carbon steel	Plate	SA-515	65	K02800	...	...	1	1
45	Carbon steel	Plate	SA-516	65	K02403	...	...	1	1

Table 6C
Section IV Maximum Allowable Stress Values, S, for Lined Water Heater Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	20	18	CI-1	W1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2	25	23	CI-1	W1	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
3	30	27	CI-1	W1	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
4	35	32	CI-1	W1	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
5	40	36	CI-1	W1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
6	42	30	...	G1, G2	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
7	45	23	CS-6	...	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
8	45	24	CS-1	...	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
9	45	25	...	...	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
10	45	25	CS-1	...	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
11	45	25	...	...	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
12	45	32	...	G1, G2	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6
13	47	26	...	G1, G2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
14	48	30	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
15	48	30	CS-2	G1	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
16	48	30	CS-2	...	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
17	48	30	CS-2	G1	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
18	48	35	...	G1, G2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
19	50	25	CS-1	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
20	50	27	CS-1	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
21	50	30	...	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
22	50	30	CS-2	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
23	50	30	...	...	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
24	55	28	CS-1	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
25	55	30	CS-2	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
26	55	30	CS-2	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
27	55	33	...	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
28	55	33	CS-2	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
29	55	33	...	...	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
30	58	36	CS-2	...	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
31	58	36	...	...	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
32	60	30	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
33	60	30	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
34	60	32	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
35	60	32	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
36	60	35	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
37	60	35	CS-2	G1	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
38	60	35	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
39	60	35	CS-2	G1	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
40	60	35	CS-2	...	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
41	60	36	CS-2	...	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
42	60	37	...	G1	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
43	65	33	CS-2	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
44	65	35	CS-2	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
45	65	35	CS-2	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3

Table 6C (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Lined Water Heater Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Class/ Cond./ Temper	Size/ Thickness, in.	P-No.	Group No.
1	Carbon steel	Sheet	SA-414	E	K02704	...	...	1	1
2	Carbon steel	Plate	SA/CSA-G40.21	44W	...	...	$t \leq 8$	1	1
3	Carbon steel	Plate	SA/CSA-G40.21	50W	...	...	$t \leq 6$	1	1
4	Carbon steel	Plate	SA-455	...	K03300	...	$0.58 < t \leq \frac{3}{4}$	1	2
5	Carbon steel	Bar	SA-675	70	...	...	...	1	2
6	Carbon steel	Forgings	SA-105	...	K03504	...	...	1	2
7	Carbon steel	Forgings	SA-181	...	K03502	70	...	1	2
8	Carbon steel	Plate	SA-515	70	K03101	...	...	1	2
9	Carbon steel	Plate	SA-516	70	K02700	...	...	1	2
10	Carbon steel	Smls. pipe	SA-106	C	K03501	...	...	1	2
11	Carbon steel	Sheet	SA-414	F	K03102	...	...	1	2
12	Carbon steel	Plate	SA-455	...	K03300	...	$\frac{3}{8} < t \leq 0.58$	1	2
13	Carbon steel	Plate	SA-455	...	K03300	...	$t \leq \frac{3}{8}$	1	2
14	Carbon steel	Sheet	SA-414	G	K03103	...	...	1	2

Table 6C (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Lined Water Heater Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	65	38	CS-2	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
2	65	44	CS-2	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
3	65	50	CS-2	...	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
4	70	35	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
5	70	35	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
6	70	36	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
7	70	36	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
8	70	38	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
9	70	38	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
10	70	40	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
11	70	42	CS-2	...	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
12	73	37	CS-2	...	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
13	75	38	CS-2	...	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8
14	75	45	CS-3	...	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8

NOTES TO TABLE 6C**GENERAL NOTES**

- (a) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (b) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - GENERAL REQUIREMENTS

G1 The stress value includes a joint factor of 0.85.

G2 Tensile value is expected minimum.

NOTES - WELDING REQUIREMENTS

W1 Welding or brazing is not permitted.

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Table 6D
Section IV Maximum Allowable Stress Values, S, for Unlined Water Heater Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Size/Thickness, in.	P-No.	Group No.
1	18Cr-2Mo	Plate	SA-240	...	S44400	$t \leq \frac{3}{8}$	7	2
2	18Cr-2Mo	Smls. tube	SA-268	...	S44400	$t \leq \frac{3}{8}$	7	2
3	18Cr-2Mo	Wld. tube	SA-268	...	S44400	$t \leq \frac{3}{8}$	7	2
4	18Cr-2Mo	Bar	SA-479	...	S44400	$t \leq \frac{3}{8}$	7	2
5	18Cr-Ti	Plate	SA-240	439	S43035	$t \leq \frac{3}{8}$	7	2
6	18Cr-Ti	Smls. tube	SA-268	TP439	S43035	$t \leq \frac{3}{8}$	7	2
7	18Cr-Ti	Bar	SA-479	439	S43035	$t \leq \frac{3}{8}$	7	2
8	29Cr-4Mo	Smls. tube	SA-268	29-4	S44700	...	10	1
9	29Cr-4Mo	Wld. tube	SA-268	29-4	S44700	...	10	1
10	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	$t \leq \frac{1}{2}$	8	1
11	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	$t \leq \frac{1}{2}$	8	1
12	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
13	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
14	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	$t \leq \frac{1}{2}$	8	1
15	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	$t \leq \frac{1}{2}$	8	1
16	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
17	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
18	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
19	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
20	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
21	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316L	S31603	$t \leq \frac{1}{2}$	8	1
22	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	$t \leq \frac{1}{2}$	8	1
23	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	$t \leq \frac{1}{2}$	8	1
24	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	$t \leq \frac{1}{2}$	8	1
25	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	$t \leq \frac{1}{2}$	8	1
26	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	$t \leq \frac{1}{2}$	8	1
27	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	$t \leq \frac{1}{2}$	8	1
28	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	$t \leq \frac{1}{2}$	8	1
29	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	$t \leq \frac{1}{2}$	8	1
30	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	$t \leq \frac{1}{2}$	8	1
31	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	$t \leq \frac{1}{2}$	8	1
32	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316	S31600	$t \leq \frac{1}{2}$	8	1
33	16Cr-12Ni-2Mo	Smls. pipe	SA-312	TP316	S31600	$t \leq \frac{1}{2}$	8	1
34	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	$t \leq \frac{1}{2}$	8	1
35	16Cr-12Ni-2Mo	Wld. pipe	SA-312	TP316	S31600	$t \leq \frac{1}{2}$	8	1
36	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	$t \leq \frac{1}{2}$	8	1
37	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	$t \leq \frac{1}{2}$	8	1
38	18Cr-8Ni	Forgings	SA-182	F304L	S30403	$t \leq \frac{1}{2}$	8	1
39	18Cr-8Ni	Forgings	SA-182	F304L	S30403	$t \leq \frac{1}{2}$	8	1
40	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
41	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
42	18Cr-8Ni	Plate	SA-240	304L	S30403	$t \leq \frac{1}{2}$	8	1
43	18Cr-8Ni	Plate	SA-240	304L	S30403	$t \leq \frac{1}{2}$	8	1
44	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
45	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	$t \leq \frac{1}{2}$	8	1

Table 6D
Section IV Maximum Allowable Stress Values, S, for Unlined Water Heater Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	60	40	CS-2	...	15.0	15.0	15.0	14.8	14.6	14.4	14.2	14.0	13.9
2	60	40	CS-2	...	15.0	15.0	15.0	14.8	14.6	14.4	14.2	14.0	13.9
3	60	40	CS-2	G1	12.8	12.8	12.8	12.6	12.4	12.2	12.1	11.9	11.8
4	60	...	CS-2	...	15.0	15.0	15.0	15.0	14.6	14.6	14.5	14.3	13.9
5	60	30	CS-2	...	15.0	15.0	15.0	14.7	14.5	14.3	14.1	14.0	13.8
6	60	30	CS-2	...	15.0	15.0	15.0	14.7	14.5	14.3	14.1	14.0	13.8
7	70	40	CS-2	...	17.5	17.5	17.5	17.2	16.9	16.7	16.5	16.3	16.1
8	80	60	HA-6	G2	20.0	20.0	20.0	19.6	19.3	19.3	19.2	19.2	19.2
9	80	60	HA-6	G1, G2	17.0	17.0	17.0	16.7	16.4	16.4	16.3	16.3	16.3
10	70	25	HA-4	...	16.7	15.1	14.2	13.4	12.7	12.2	11.7	11.3	10.9
11	70	25	HA-4	G3	17.5	17.3	17.0	16.5	16.0	15.8	15.6	15.3	14.8
12	70	25	HA-4	...	16.7	15.1	14.2	13.4	12.7	12.2	11.7	11.3	10.9
13	70	25	HA-4	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
14	70	25	HA-4	...	16.7	15.1	14.2	13.4	12.7	12.2	11.7	11.3	10.9
15	70	25	HA-4	G3	17.5	17.3	17.0	16.5	16.0	15.8	15.6	15.3	14.8
16	70	25	HA-4	G1	14.2	12.9	12.1	11.4	10.8	10.3	9.9	9.6	9.3
17	70	25	HA-4	G1, G3	14.9	14.7	14.5	14.0	13.6	13.4	13.2	13.0	12.5
18	70	25	HA-4	...	16.7	15.1	14.2	13.4	12.7	12.2	11.7	11.3	10.9
19	70	25	HA-4	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
20	70	25	HA-4	G1	14.2	12.9	12.1	11.4	10.8	10.3	9.9	9.6	9.3
21	70	25	HA-4	G1, G3	14.9	14.5	14.0	13.5	13.0	12.7	12.5	12.3	12.2
22	70	25	HA-4	...	16.7	15.1	14.2	13.4	12.7	12.2	11.7	11.3	10.9
23	70	25	HA-4	G3	17.5	17.3	17.0	16.5	16.0	15.8	15.6	15.3	14.8
24	75	30	HA-2	...	18.8	18.3	17.3	16.4	15.6	14.9	14.3	13.8	13.3
25	75	30	HA-2	G3	18.8	18.8	18.8	18.5	18.2	18.1	18.0	18.0	18.0
26	75	30	HA-2	...	18.8	18.3	17.3	16.4	15.6	14.9	14.3	13.8	13.3
27	75	30	HA-2	G3	18.8	18.8	18.8	18.5	18.2	18.1	18.0	18.0	18.0
28	75	30	HA-2	...	18.8	18.3	17.3	16.4	15.6	14.9	14.3	13.8	13.3
29	75	30	HA-2	G3	18.8	18.8	18.8	18.5	18.2	18.1	18.0	18.0	18.0
30	75	30	HA-2	G1	15.9	15.5	14.7	13.9	13.3	12.7	12.1	11.7	11.3
31	75	30	HA-2	G1, G3	15.9	15.9	15.9	15.7	15.5	15.4	15.3	15.3	15.3
32	75	30	HA-2	...	18.8	18.3	17.3	16.4	15.6	14.9	14.3	13.8	13.3
33	75	30	HA-2	G3	18.8	18.8	18.8	18.5	18.2	18.1	18.0	18.0	18.0
34	75	30	HA-2	G1	15.9	15.5	14.7	13.9	13.3	12.7	12.1	11.7	11.3
35	75	30	HA-2	G1, G3	15.9	15.9	15.9	15.7	15.5	15.4	15.3	15.3	15.3
36	75	30	HA-2	...	18.8	18.3	17.3	16.4	15.6	14.9	14.3	13.8	13.3
37	75	30	HA-2	G3	18.8	18.8	18.8	18.5	18.2	18.1	18.0	18.0	18.0
38	70	25	HA-3	...	16.7	15.1	14.3	13.5	12.8	12.2	11.7	11.3	10.9
39	70	25	HA-3	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
40	70	25	HA-3	...	16.7	15.1	14.3	13.5	12.8	12.2	11.7	11.3	10.9
41	70	25	HA-3	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
42	70	25	HA-3	...	16.7	15.1	14.3	13.5	12.8	12.2	11.7	11.3	10.9
43	70	25	HA-3	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
44	70	25	HA-3	G1	14.2	12.9	12.1	11.4	10.9	10.4	9.9	9.6	9.3
45	70	25	HA-3	G1, G3	14.9	14.5	14.0	13.5	13.0	12.7	12.5	12.3	12.2

Table 6D (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Unlined Water Heater Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/ Grade	Alloy Desig./ UNS No.	Size/ Thickness, in.	P-No.	Group No.
1	18Cr-8Ni	Smls. pipe	SA-312	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
2	18Cr-8Ni	Smls. pipe	SA-312	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
3	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
4	18Cr-8Ni	Wld. pipe	SA-312	TP304L	S30403	$t \leq \frac{1}{2}$	8	1
5	18Cr-8Ni	Bar	SA-479	304L	S30403	$t \leq \frac{1}{2}$	8	1
6	18Cr-8Ni	Bar	SA-479	304L	S30403	$t \leq \frac{1}{2}$	8	1
7	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	8	1
8	18Cr-8Ni	Forgings	SA-182	F304	S30400	...	8	1
9	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	$t \leq \frac{1}{2}$	8	1
10	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	$t \leq \frac{1}{2}$	8	1
11	18Cr-8Ni	Plate	SA-240	304	S30400	$t \leq \frac{1}{2}$	8	1
12	18Cr-8Ni	Plate	SA-240	304	S30400	$t \leq \frac{1}{2}$	8	1
13	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	$t \leq \frac{1}{2}$	8	1
14	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	$t \leq \frac{1}{2}$	8	1
15	18Cr-8Ni	Smls. pipe	SA-312	TP304	S30400	$t \leq \frac{1}{2}$	8	1
16	18Cr-8Ni	Smls. pipe	SA-312	TP304	S30400	$t \leq \frac{1}{2}$	8	1
17	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	$t \leq \frac{1}{2}$	8	1
18	18Cr-8Ni	Wld. pipe	SA-312	TP304	S30400	$t \leq \frac{1}{2}$	8	1
19	18Cr-8Ni	Bar	SA-479	304	S30400	$t \leq \frac{1}{2}$	8	1
20	18Cr-8Ni	Bar	SA-479	304	S30400	$t \leq \frac{1}{2}$	8	1
21	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...	10H	1
22	22Cr-5Ni-3Mo-N	Smls. tube	SA-789	...	S31803	...	10H	1
23	22Cr-5Ni-3Mo-N	Wld. tube	SA-789	...	S31803	...	10H	1
24	22Cr-5Ni-3Mo-N	Smls. pipe	SA-790	...	S31803	...	10H	1
25	22Cr-5Ni-3Mo-N	Wld. pipe	SA-790	...	S31803	...	10H	1

Table 6D (Cont'd)
Section IV Maximum Allowable Stress Values, S, for Unlined Water Heater Materials

Line No.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	External Pressure Chart No.	Notes	Maximum Allowable Stress, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding								
					100	150	200	250	300	350	400	450	500
1	70	25	HA-3	...	16.7	15.1	14.3	13.5	12.8	12.2	11.7	11.3	10.9
2	70	25	HA-3	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
3	70	25	HA-3	G1	14.2	12.9	12.1	11.4	10.9	10.4	9.9	9.6	9.3
4	70	25	HA-3	G1, G3	14.9	14.5	14.0	13.5	13.0	12.7	12.5	12.3	12.2
5	70	25	HA-3	...	16.7	15.1	14.3	13.5	12.8	12.2	11.7	11.3	10.9
6	70	25	HA-3	G3	17.5	17.0	16.5	15.9	15.3	15.0	14.7	14.5	14.4
7	75	30	HA-1	...	18.8	18.3	16.7	15.8	14.9	14.4	13.8	13.4	12.9
8	75	30	HA-1	G3	18.8	18.3	17.8	17.2	16.6	16.3	16.0	15.9	15.9
9	75	30	HA-1	...	18.8	18.3	16.7	15.7	14.9	14.4	13.8	13.4	12.9
10	75	30	HA-1	G3	18.8	18.3	17.8	17.2	16.6	16.3	16.0	15.9	15.9
11	75	30	HA-1	...	18.8	18.3	16.7	15.8	14.9	14.4	13.8	13.4	12.9
12	75	30	HA-1	G3	18.8	18.3	17.8	17.2	16.6	16.3	16.0	15.9	15.9
13	75	30	HA-1	G1	15.9	15.5	14.2	13.4	12.7	12.2	11.7	11.4	11.0
14	75	30	HA-1	G1, G3	15.9	15.5	15.1	14.6	14.1	13.8	13.6	13.5	13.5
15	75	30	HA-1	...	18.8	18.3	16.7	15.8	14.9	14.4	13.8	13.4	12.9
16	75	30	HA-1	G3	18.8	18.3	17.8	17.2	16.6	16.3	16.0	15.9	15.9
17	75	30	HA-1	G1	15.9	15.5	14.2	13.4	12.7	12.2	11.7	11.4	11.0
18	75	30	HA-1	G1, G3	15.9	15.5	15.1	14.6	14.1	13.8	13.6	13.5	13.5
19	75	30	HA-1	...	18.8	18.3	16.7	15.8	14.9	14.4	13.8	13.4	12.9
20	75	30	HA-1	G3	18.8	18.3	17.8	17.2	16.6	16.3	16.0	15.9	15.9
21	90	65	HA-5	...	22.5	22.5	22.5	22.1	21.7	21.3	20.9	20.6	20.4
22	90	65	HA-5	...	22.5	22.5	22.5	22.1	21.7	21.3	20.9	20.6	20.4
23	90	65	HA-5	G1	19.1	19.1	19.1	18.8	18.4	18.1	17.8	17.5	17.3
24	90	65	HA-5	...	22.5	22.5	22.5	22.1	21.7	21.3	20.9	20.6	20.4
25	90	65	HA-5	G1	19.1	19.1	19.1	18.8	18.4	18.1	17.8	17.5	17.3

NOTES TO TABLE 6D**GENERAL NOTES**

- (a) The following abbreviations are used: Smls., Seamless; and Wld., Welded.
- (b) The stress values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (c) The properties of steels are influenced by the processing history, heat treatment, melting practice, and level of residual elements. See Nonmandatory Appendix A for more information.
- (d) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTES - GENERAL REQUIREMENTS

- G1 The stress value includes a joint factor of 0.85.
- G2 Heat treatment after forming or fabrication is neither required nor prohibited.
- G3 Due to the relatively low yield strength of these materials, these higher stress values were established at temperatures where the short-time tensile properties govern to permit the use of these alloys where slightly greater deformation is acceptable. The stress values in this range exceed $66\frac{2}{3}\%$ but do not exceed 90% of the yield strength at temperature. Use of these stresses may result in dimensional changes due to permanent strain. These stress values are not recommended for the flanges of gasketed joints or other applications where slight amounts of distortion can cause leakage or malfunction.

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Table U
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
(23)	Ferrous Materials							
	1	Carbon steel	Sheet	SA-1008	CS-A	...	...	40
	2	Carbon steel	Sheet	SA-1008	CS-B	...	...	40
	3	Carbon steel	Bar	SA-675	45	...	...	45
	4	Carbon steel	Wld. pipe	SA-134	A283A	...	...	45
	5	...	...	...	...	...	...	...
	6	Carbon steel	Plate	SA-285	A	K01700	...	45
	7	Carbon steel	Wld. pipe	SA-672	A45	K01700	...	45
	8	Carbon steel	Sheet	SA-414	A	K01501	...	45
	9	Carbon steel	Wld. tube	SA-178	A	K01200	...	47
10	Carbon steel	Smls. tube	SA-179	...	K01200	...	47	
11	Carbon steel	Smls. tube	SA-192	...	K01201	...	47	
12	Carbon steel	Wld. tube	SA-214	...	K01807	...	47	
13	Carbon steel	Smls. tube	SA-556	A2	K01807	...	47	
14	Carbon steel	Wld. tube	SA-557	A2	K01807	...	47	
15	Carbon steel	Wld. pipe	SA-53	E/A	K02504	...	48	
16	Carbon steel	Smls. pipe	SA-53	S/A	K02504	...	48	
17	Carbon steel	Smls. pipe	SA-106	A	K02501	...	48	
18	Carbon steel	Wld. pipe	SA-135	A	...	...	48	
19	Carbon steel	Forged pipe	SA-369	FPA	K02501	...	48	
20	Carbon steel	Wld. pipe	SA-587	...	K11500	...	48	
21	Carbon steel	Bar	SA-675	50	...	...	50	
22	Carbon steel	Wld. pipe	SA-134	A283B	...	...	50	
23	...	...	...	...	...	...	...	
24	Carbon steel	Plate	SA-285	B	K02200	...	50	
25	Carbon steel	Wld. pipe	SA-672	A50	K02200	...	50	
26	Carbon steel	Sheet	SA-414	B	K02201	...	50	
27	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	6 < t ≤ 10	
28	Carbon steel	Plate	SA/EN 10028-2	P235GH	...	...	≤ 2 1/4	
29	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	4 < t ≤ 6	
30	Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...	t ≤ 2 1/2	
31	Carbon steel	Sheet, strip	SA-1011	36	SS	Type 1	t ≤ 0.23	
32	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	2 1/4 < t ≤ 4	
33	Carbon steel	Bar	SA-675	55	...	...	55	
34	Carbon steel	Wld. pipe	SA-134	A283C	K02401	...	55	
35	Carbon steel	Plate	SA-283	C	K02401	...	55	
36	Carbon steel	Plate	SA-285	C	K02801	...	55	
37	Carbon steel	Smls. & wld. pipe	SA-333	1	K03008	...	55	
38	Carbon steel	Smls. & wld. tube	SA-334	1	K03008	...	55	
39	Carbon steel	Plate	SA-516	55	K01800	...	55	
40	Carbon steel	Smls. pipe	SA-524	II	K02104	...	55	
41	Carbon steel	Wld. pipe	SA-671	CA55	K02801	...	55	
42	Carbon steel	Wld. pipe	SA-671	CE55	K02202	...	55	
43	Carbon steel	Wld. pipe	SA-672	A55	K02801	...	55	
44	Carbon steel	Wld. pipe	SA-672	B55	K02001	...	55	
45	Carbon steel	Wld. pipe	SA-672	C55	K01800	...	55	

Table U
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials													
1	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.5	36.8	33.5	29.9	26.2	23.1
2	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.5	36.8	33.5	29.9	26.2	23.1
3	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.4	41.3	37.7	33.6	29.5	25.9
4	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.4	41.3	37.7	33.6	29.5	25.9
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.4	41.3	37.7	33.6	29.5	25.9
7	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.4	41.3	37.7	33.6	29.5	25.9
8	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.4	41.3	37.7	33.6	29.5	25.9
9	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.4	43.2	39.3	35.1	30.8	27.1
10	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.4	43.2	39.3	35.1	30.8	27.1
11	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.4	43.2	39.3	35.1	30.8	27.1
12	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.4	43.2	39.3	35.1	30.8	27.1
13	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.4	43.2	39.3	35.1	30.8	27.1
14	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.4	43.2	39.3	35.1	30.8	27.1
15	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	47.4	44.1	40.2	35.8	31.5	27.7
16	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	47.4	44.1	40.2	35.8	31.5	27.7
17	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	47.4	44.1	40.2	35.8	31.5	27.7
18	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	47.4	44.1	40.2	35.8	31.5	27.7
19	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	47.4	44.1	40.2	35.8	31.5	27.7
20	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	47.4	44.1	40.2	35.8	31.5	27.7
21	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.4	45.9	41.8	37.3	32.8	28.8
22	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.4	45.9	41.8	37.3	32.8	28.8
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.4	45.9	41.8	37.3	32.8	28.8
25	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.4	45.9	41.8	37.3	32.8	28.8
26	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.4	45.9	41.8	37.3	32.8	28.8
27	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	50.3	46.8	42.6	38.0	33.3	29.1
28	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	51.4	47.8	43.5	38.8	34.1	30.0
29	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	51.7	48.1	43.9	39.1	34.3	29.9
30	52.2	52.2	52.2	52.2	52.2	52.2	52.2	52.2	51.6	48.0	43.7	39.0	34.3	30.1
31	53.0	53.0	53.0	53.0	53.0	52.9	...	...	...	...	...	...	...	...
32	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.1	49.5	45.1	40.2	35.2	30.8
33	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
34	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
35	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
36	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
37	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
38	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
39	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
40	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
41	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
42	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
43	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
44	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
45	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7

Table U
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	Carbon steel	Wld. pipe	SA-672	E55	K02202	...	...	55
2	Carbon steel	Sheet	SA-414	C	K02503	...	...	55
3	Carbon steel	Sheet, strip	SA-1011	40	SS	...	$t \leq 0.23$	55
4	Carbon steel	Sheet, strip	SA-1011	45	HSLAS	2	...	55
5	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...	$\leq 2\frac{1}{4}$	56.5
6	Carbon steel	Plate, sheet, bar	SA-36	...	K02600	...	...	58
7	Carbon steel	Plate, sheet	SA-662	A	K01701	...	...	58
8	Carbon steel	Sheet, strip	SA-1011	36	SS	Type 2	$t \leq 0.23$	58
9	Carbon steel	Plate	SA/EN 10028-2	P265GH	...	...	$\leq 2\frac{1}{4}$	59.5
10	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...	$t \leq 2\frac{1}{2}$	59.5
11	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...	...	59.5
12	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...	...	59.5
13	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...	...	59.5
14	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...	...	59.5
15	Carbon steel	Forgings	SA-181	...	K03502	60	...	60
16	Carbon steel	Castings	SA-216	WCA	J02502	...	...	60
17	Carbon steel	Forgings	SA-266	1	K03506	...	...	60
18	Carbon steel	Bolting	SA-307	A	...	...	$\frac{1}{4} \leq t \leq 4$	60
19	Carbon steel	Bolting	SA-307	B	...	...	...	60
20	Carbon steel	Forgings	SA-350	LF1	K03009	1	...	60
21	Carbon steel	Castings	SA-352	LCA	J02504	...	...	60
22	Carbon steel	Cast pipe	SA-660	WCA	J02504	...	...	60
23	Carbon steel	Bar	SA-675	60	...	...	...	60
24	Carbon steel	Forgings	SA-765	1	K03046	...	...	60
25	Carbon steel	Plate	SA-515	60	K02401	...	...	60
26	Carbon steel	Plate	SA-516	60	K02100	...	...	60
27	Carbon steel	Wld. pipe	SA-671	CB60	K02401	...	...	60
28	Carbon steel	Wld. pipe	SA-671	CC60	K02100	...	...	60
29	Carbon steel	Wld. pipe	SA-671	CE60	K02402	...	...	60
30	Carbon steel	Wld. pipe	SA-672	B60	K02401	...	...	60
31	Carbon steel	Wld. pipe	SA-672	C60	K02100	...	...	60
32	Carbon steel	Wld. pipe	SA-672	E60	K02402	...	...	60
33	Carbon steel	Wld. pipe	SA-134	A283D	K02702	...	...	60
34	Carbon steel	Plate	SA-283	D	K02702	...	...	60
35	Carbon steel	Wld. pipe	SA-53	E/B	K03005	...	...	60
36	Carbon steel	Smls. pipe	SA-53	S/B	K03005	...	...	60
37	Carbon steel	Smls. pipe	SA-106	B	K03006	...	...	60
38	Carbon steel	Wld. pipe	SA-135	B	...	...	...	60
39	Carbon steel	Smls. & wld. ftgs.	SA-234	WPB	K03006	...	...	60
40	Carbon steel	Smls. & wld. pipe	SA-333	6	K03006	...	...	60
41	Carbon steel	Smls. & wld. tube	SA-334	6	K03006	...	...	60
42	Carbon steel	Forged pipe	SA-369	FPB	K03006	...	...	60
43	Carbon steel	Forgings	SA-372	A	K03002	...	...	60
44	Carbon steel	Sheet	SA-414	D	K02505	...	...	60
45	Carbon steel	Smls. & wld. ftgs.	SA-420	WPL6	...	...	...	60

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
2	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	54.3	50.5	46.0	41.1	36.1	31.7
3	55.0	55.0	55.0	55.0	55.0	54.9	...	...	...	...	...	...	...	...
4	55.0	55.0	55.0	55.0	55.0	54.9	...	...	...	...	...	...	...	...
5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.0	52.1	47.5	42.4	37.1	32.4
6	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	57.3	53.3	48.5	43.3	38.0	33.4
7	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	57.3	53.3	48.5	43.3	38.0	33.4
8	58.0	58.0	58.0	58.0	58.0	58.0	...	...	...	...	...	...	...	...
9	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	58.8	54.7	49.8	44.4	39.0	34.3
10	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	58.7	54.6	49.8	44.4	39.0	34.3
11	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	...	...	...	...	...	...
12	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	...	...	...	...	...	...
13	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	...	...	...	...	...	...
14	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	...	...	...	...	...	...
15	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
16	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
17	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
18	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
19	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
20	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
21	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
22	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
23	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
24	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
25	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
26	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
27	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
28	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
29	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
30	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
31	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
32	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
33	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
34	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
35	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
36	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
37	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
38	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
39	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
40	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
41	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
42	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
43	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
44	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
45	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	Carbon steel	Smls. pipe	SA-524	I	K02104	...	...	60
2	Carbon steel	Bar	SA-696	B	K03200	...	...	60
3	Carbon steel	Forgings	SA-727	...	K02506	...	...	60
4	Carbon steel	Wld. tube	SA-178	C	K03503	...	...	60
5	Carbon steel	Smls. tube	SA-210	A-1	K02707	...	...	60
6	Carbon steel	Smls. tube	SA-556	B2	K02707	...	...	60
7	Carbon steel	Wld. tube	SA-557	B2	K03007	...	...	60
8	Carbon steel	Plate, bar	SA/CSA-G40.21	38W	...	...	...	60
9	Carbon steel	Plate, sheet, bar	SA-572	42	...	...	$t \leq 6$	60
10	Carbon steel	Sheet, strip	SA-1011	45	HSLAS	1	...	60
11	Carbon steel	Sheet, strip	SA-1011	45	SS	...	$t \leq 0.23$	60
12	Carbon steel	Sheet, strip	SA-1011	50	HSLAS	2	...	60
13	Carbon steel	Plate	SA/AS 1548	PT430	...	...	≤ 6	62.5
14	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$6 < t \leq 10$	62.5
15	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	$4 < t \leq 6$	64
16	Carbon steel	Bar	SA-675	65	...	...	...	65
17	Carbon steel	Castings	SA-352	LCB	J03003	...	...	65
18	Carbon steel	Plate	SA-515	65	K02800	...	...	65
19	Carbon steel	Plate	SA-516	65	K02403	...	...	65
20	Carbon steel	Wld. pipe	SA-671	CB65	K02800	...	...	65
21	Carbon steel	Wld. pipe	SA-671	CC65	K02403	...	...	65
22	Carbon steel	Wld. pipe	SA-672	B65	K02800	...	...	65
23	Carbon steel	Wld. pipe	SA-672	C65	K02403	...	...	65
24	Carbon steel	Sheet	SA-414	E	K02704	...	...	65
25	Carbon steel	Plate	SA-662	B	K02203	...	...	65
26	Carbon steel	Plate	SA-537	...	K12437	1	$2\frac{1}{2} < t \leq 4$	65
27	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	$2\frac{1}{2} < t \leq 4$	65
28	Carbon steel	Plate, bar	SA/CSA-G40.21	44W	...	...	$t \leq 8$	65
29	Carbon steel	Plate, bar	SA/CSA-G40.21	50W	...	...	$t \leq 6$	65
30	Carbon steel	Plate, sheet, bar	SA-572	50	...	...	$t \leq 4$	65
31	Carbon steel	Round bar	SA-572	50	...	...	$t \leq 11$	65
32	Carbon steel	Sheet, strip	SA-1011	50	SS	...	$t \leq 0.23$	65
33	Carbon steel	Sheet, strip	SA-1011	50	HSLAS	1	...	65
34	Carbon steel	Sheet, strip	SA-1011	55	HSLAS	2	...	65
35	Carbon steel	Plate	SA/AS 1548	PT460	...	...	≤ 6	66.5
36	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...	≤ 4	66.5
37	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	N, NT, or QT	$t \leq 6.3$	66.5
38	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$6 < t \leq 10$	68
39	Carbon steel	Plate	SA/GB 713	Q345R	...	...	$6 < t \leq 10$	68
40	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...	$0.12 < t \leq 3.15$	68
41	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	$4 < t \leq 6$	69.5
42	Carbon steel	Plate	SA/GB 713	Q345R	...	...	$4 < t \leq 6$	69.5
43	Carbon steel	Plate	SA-455	...	K03300	...	$0.58 < t \leq \frac{3}{4}$	70
44	Carbon steel	Bar	SA-675	70	...	...	...	70
45	Carbon steel	Forgings	SA-105	...	K03504	...	...	70

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
2	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
3	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
4	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
5	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
6	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
7	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	59.3	55.1	50.2	44.8	39.4	34.6
8	60.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	57.3	53.3	48.5	43.3	38.0	33.4
9	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...	...	...	...	...	...
10	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...	...	...	...	...	...
11	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...	...	...	...	...	...
12	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...	...	...	...	...	...
13	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	61.7	57.4	52.3	46.7	41.0	36.0
14	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	61.7	57.4	52.3	46.7	41.0	36.0
15	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	63.2	58.8	53.5	47.5	42.0	36.9
16	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
17	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
18	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
19	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
20	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
21	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
22	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
23	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
24	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
25	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
26	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
27	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.7	54.4	48.5	42.6	37.5
28	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.8	54.5	48.6	42.7	37.4
29	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.2	59.8	54.5	48.6	42.7	37.4
30	65.0	65.0	65.0	65.0	65.0	65.0	...	...	...	...	...	...	...	...
31	65.0	65.0	65.0	65.0	65.0	65.0	...	...	...	...	...	...	...	...
32	65.0	65.0	65.0	65.0	65.0	65.0	...	...	...	...	...	...	...	...
33	65.0	65.0	65.0	65.0	65.0	65.0	...	...	...	...	...	...	...	...
34	65.0	65.0	65.0	65.0	65.0	65.0	...	...	...	...	...	...	...	...
35	66.5	66.5	66.5	66.5	66.5	66.5	66.5	66.5	65.7	61.1	55.6	49.6	43.6	38.3
36	66.5	66.5	66.5	66.5	66.5	66.5	66.5	66.5	65.7	61.1	55.6	49.6	43.6	38.3
37	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	65.7	61.2	55.8	49.8	43.6	38.1
38	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	65.5	62.2	57.5	51.7	45.0	37.7
39	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	67.3	62.5	56.9	50.7	44.5	39.4
40	68.2	...	...	...	...	...	...	...	...	...	...	...	...	...
41	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	66.9	63.5	58.8	52.8	45.9	38.5
42	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	68.7	63.9	58.1	51.7	45.5	40.2
43	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
44	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
45	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
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32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	Carbon steel	Forgings	SA-181	...	K03502	70	...	70
2	Carbon steel	Castings	SA-216	WCB	J03002	...	...	70
3	Carbon steel	Forgings	SA-266	2	K03506	...	...	70
4	Carbon steel	Forgings	SA-266	4	K03017	...	...	70
5	Carbon steel	Forgings	SA-350	LF2	K03011	...	...	70
6	Carbon steel	Forgings	SA-508	1	K13502	...	...	70
7	Carbon steel	Forgings	SA-508	1A	K13502	...	...	70
8	Carbon steel	Forgings	SA-541	1	K03506	...	...	70
9	Carbon steel	Forgings	SA-541	1A	K03020	...	...	70
10	Carbon steel	Cast pipe	SA-660	WCB	J03003	...	...	70
11	Carbon steel	Forgings	SA-765	II	K03047	...	...	70
12	Carbon steel	Plate	SA-515	70	K03101	...	...	70
13	Carbon steel	Plate	SA-516	70	K02700	...	...	70
14	Carbon steel	Wld. pipe	SA-671	CB70	K03101	...	...	70
15	Carbon steel	Wld. pipe	SA-671	CC70	K02700	...	...	70
16	Carbon steel	Wld. pipe	SA-672	B70	K03101	...	...	70
17	Carbon steel	Wld. pipe	SA-672	C70	K02700	...	...	70
18	Carbon steel	Smls. pipe	SA-106	C	K03501	...	...	70
19	Carbon steel	Wld. tube	SA-178	D	...	...	...	70
20	Carbon steel	Smls. tube	SA-210	C	K03501	...	...	70
21	Carbon steel	Castings	SA-216	WCC	J02503	...	...	70
22	Carbon steel	Smls. & wld. ftgs.	SA-234	WPC	K03501	...	...	70
23	Carbon steel	Castings	SA-352	LCC	J02505	...	...	70
24	Carbon steel	Castings	SA-487	16	...	A	...	70
25	Carbon steel	Plate	SA-537	...	K12437	3	4 < t ≤ 6	70
26	Carbon steel	Smls. tube	SA-556	C2	K03006	...	...	70
27	Carbon steel	Tube	SA-557	C2	K03505	...	...	70
28	Carbon steel	Cast pipe	SA-660	WCC	J02505	...	...	70
29	Carbon steel	Bar	SA-696	C	K03200	...	...	70
30	Carbon steel	Sheet	SA-414	F	K03102	...	...	70
31	Carbon steel	Plate	SA-662	C	K02007	...	...	70
32	Carbon steel	Plate	SA-537	...	K12437	2	4 < t ≤ 6	70
33	Carbon steel	Plate	SA-738	C	K02008	...	4 < t ≤ 6	70
34	Carbon steel	Plate	SA-537	...	K12437	1	≤ 2½	70
35	Carbon steel	Wld. pipe	SA-671	CD70	K12437	...	≤ 2½	70
36	Carbon steel	Wld. pipe	SA-672	D70	K12437	...	≤ 2½	70
37	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...	≤ 2½	70
38	Carbon steel	Plate	SA-841	A	...	1	≤ 4	70
39	Carbon steel	Plate, sheet, bar	SA-572	55	...	...	t ≤ 2	70
40	Carbon steel	Round bar	SA-572	55	...	...	t ≤ 3½	70
41	Carbon steel	Sheet, strip	SA-1011	55	HSLAS	1	...	70
42	Carbon steel	Sheet, strip	SA-1011	60	HSLAS	2	...	70
43	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	N or NT	t ≤ 6.3	71
44	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	2.5 < t ≤ 4	71
45	Carbon steel	Plate	SA/GB 713	Q345R	...	...	1.5 < t ≤ 4	71

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
2	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
3	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
4	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
5	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
6	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
7	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
8	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
9	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
10	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
11	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
12	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
13	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
14	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
15	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
16	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
17	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
18	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
19	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
20	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
21	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
22	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
23	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
24	70.0	69.5	65.7	63.3	62.6	62.6	62.6	62.6	62.3	59.2	...	...	...	...
25	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
26	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
27	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
28	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
29	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
30	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
31	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.1	64.3	58.6	52.3	45.9	40.4
32	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
33	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
34	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
35	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
36	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
37	70.0	70.0	69.1	68.4	68.4	68.4	68.4	68.4	67.7	65.4	...	...	...	...
38	70.0	70.0	70.0	70.0	70.0	69.9	68.4	...	...	...	...	...	...	...
39	70.0	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...
40	70.0	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...
41	70.0	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...
42	70.0	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...
43	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	70.0	65.2	59.4	53.0	46.5	40.6
44	71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0	68.3	64.8	60.0	53.9	46.9	39.3
45	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	70.1	65.2	59.3	52.8	46.4	41.0

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	Carbon steel	Plate	SA/GB 713	Q345R	...	...	$\frac{5}{8} < t \leq 1.5$	72.5
2	Carbon steel	Plate	SA-455	...	K03300	...	$\frac{3}{8} < t \leq \frac{5}{8}$	73
3	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	QT	$t \leq 2.8$	74
4	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...	≤ 2.5	74
5	Carbon steel	Plate	SA/GB 713	Q345R	...	...	$\frac{1}{8} \leq t \leq \frac{5}{8}$	74
6	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...	$t < 0.12$	74
7	Carbon steel	Forgings	SA-266	3	K05001	...	...	75
8	Carbon steel	Plate	SA-455	...	K03300	...	$\leq \frac{3}{8}$	75
9	Carbon steel	Plate	SA-299	A	K02803	...	> 1	75
10	Carbon steel	Wld. pipe	SA-671	CK75	K02803	...	> 1	75
11	Carbon steel	Wld. pipe	SA-672	N75	K02803	...	> 1	75
12	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	> 1	75
13	Carbon steel	Plate	SA-299	A	K02803	...	≤ 1	75
14	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...	≤ 1	75
15	Carbon steel	Forgings	SA-372	B	K04001	...	...	75
16	Carbon steel	Sheet	SA-414	G	K03103	...	...	75
17	Carbon steel	Plate	SA-738	A	K12447	...	...	75
18	Carbon steel	Plate	SA-537	...	K12437	3	$2\frac{1}{2} < t \leq 4$	75
19	Carbon steel	Plate	SA-537	...	K12437	2	$2\frac{1}{2} < t \leq 4$	75
20	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437	...	$2\frac{1}{2} < t \leq 4$	75
21	Carbon steel	Plate	SA-738	C	K02008	...	$2\frac{1}{2} < t \leq 4$	75
22	Carbon steel	Plate, sheet, bar	SA-572	60	...	...	$t \leq 1\frac{1}{4}$	75
23	Carbon steel	Round bar	SA-572	60	...	...	$t \leq 3\frac{1}{2}$	75
24	Carbon steel	Sheet, strip	SA-1011	60	HSLAS	1	...	75
25	Carbon steel	Plate	SA-299	B	K02803	...	> 1	80
26	Carbon steel	Plate	SA-299	B	K02803	...	≤ 1	80
27	Carbon steel	Forgings	SA-765	IV	K02009	...	...	80
28	Carbon steel	Plate	SA-537	...	K12437	3	$\leq 2\frac{1}{2}$	80
29	Carbon steel	Plate	SA-537	...	K12437	2	$\leq 2\frac{1}{2}$	80
30	Carbon steel	Wld. pipe	SA-671	CD80	K12437	...	$\leq 2\frac{1}{2}$	80
31	Carbon steel	Wld. pipe	SA-672	D80	K12437	...	$\leq 2\frac{1}{2}$	80
32	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437	...	$\leq 2\frac{1}{2}$	80
33	Carbon steel	Plate	SA-738	C	K02008	...	$\leq 2\frac{1}{2}$	80
34	Carbon steel	Plate	SA-841	B	...	2	≤ 4	80
35	Carbon steel	Plate, sheet, bar	SA-572	65	...	...	$t \leq 1\frac{1}{4}$	80
36	Carbon steel	Plate	SA-612	...	K02900	...	$\frac{1}{2} < t \leq 1$	81
37	Carbon steel	Plate	SA-841	F	...	6	$t \leq 1.25$	82
38	Carbon steel	Plate	SA-612	...	K02900	...	$\leq \frac{1}{2}$	83
39	Carbon steel	Plate	SA-738	B	K12007	...	...	85
40	Carbon steel	Plate	SA-841	F	...	7	$t \leq 1$	86
41	Carbon steel	Forgings	SA-372	C	K04801	...	...	90
42	Carbon steel	Bolting	SA-449	...	K04200	...	$1\frac{1}{2} < t \leq 3$	90
43	Carbon steel	Plate	SA-724	A	K11831	...	...	90
44	Carbon steel	Plate	SA-724	C	K12037	...	...	90
45	Carbon steel	Plate	SA-724	B	K12031	...	...	95

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	72.5	72.5	72.5	72.5	72.5	72.5	72.5	72.5	71.6	66.5	60.5	53.9	47.4	41.9
2	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	72.1	67.1	61.1	54.5	47.9	42.1
3	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	72.9	67.9	61.8	55.2	48.4	42.2
4	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	71.1	67.5	62.4	56.1	48.8	40.9
5	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	73.0	67.9	61.7	55.0	48.3	42.7
6	74.0	...	...	...	...	...	...	...	...	...	...	...	...	...
7	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
8	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
9	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
10	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
11	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
12	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
13	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
14	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
15	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
16	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
17	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.1	68.9	62.8	56.0	49.2	43.2
18	75.0	75.0	74.0	73.3	73.2	73.2	73.2	73.2	72.5	70.1	...	...	...	...
19	75.0	75.0	74.0	73.3	73.2	73.2	73.2	73.2	72.5	70.1	...	...	...	...
20	75.0	75.0	74.0	73.3	73.2	73.2	73.2	73.2	72.5	70.1	...	...	...	...
21	75.0	75.0	74.0	73.3	73.2	73.2	73.2	73.2	72.5	70.1	...	...	...	...
22	75.0	75.0	75.0	75.0	75.0	75.0	...	...	...	...	...	...	...	...
23	75.0	75.0	75.0	75.0	75.0	75.0	...	...	...	...	...	...	...	...
24	75.0	75.0	75.0	75.0	75.0	75.0	...	...	...	...	...	...	...	...
25	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.0	73.5	66.9	59.7	52.5	46.1
26	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.0	73.5	66.9	59.7	52.5	46.1
27	80.0	80.0	80.0	79.1	79.1	79.1	78.8	77.7	...	...	...	...	...	...
28	80.0	80.0	78.9	78.2	78.1	78.1	78.1	78.1	77.4	74.8	...	...	...	...
29	80.0	80.0	78.9	78.2	78.1	78.1	78.1	78.1	77.4	74.8	...	...	...	...
30	80.0	80.0	78.9	78.2	78.1	78.1	78.1	78.1	77.4	74.8	...	...	...	...
31	80.0	80.0	78.9	78.2	78.1	78.1	78.1	78.1	77.4	74.8	...	...	...	...
32	80.0	80.0	78.9	78.2	78.1	78.1	78.1	78.1	77.4	74.8	...	...	...	...
33	80.0	80.0	78.9	78.2	78.1	78.1	78.1	78.1	77.4	74.8	...	...	...	...
34	80.0	80.0	80.0	80.0	80.0	79.9	78.2	...	...	...	...	...	...	...
35	80.0	80.0	80.0	80.0	80.0	79.9	...	...	...	...	...	...	...	...
36	81.0	81.0	79.4	79.4	79.4	79.4	79.4	79.4	...	...	...	...	...	...
37	82.0	82.0	82.0	82.0	82.0	81.8	80.2	...	...	...	...	...	...	...
38	83.0	83.0	81.3	81.3	81.3	81.3	81.3	81.3	...	...	...	...	...	...
39	85.0	85.0	85.0	85.0	85.0	84.2	83.0	81.0	78.3	74.6	...	...	...	...
40	86.0	86.0	86.0	86.0	86.0	85.8	84.2	...	...	...	...	...	...	...
41	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	88.9	82.7	75.3	67.2	59.0	51.9
42	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	88.9	82.7	75.3	67.2	59.0	51.9
43	90.0	90.0	88.8	87.9	87.9	87.9	87.9	87.9	87.0	84.1	...	...	...	...
44	90.0	90.0	88.8	87.9	87.9	87.9	87.9	87.9	87.0	84.1	...	...	...	...
45	95.0	95.0	93.7	92.8	92.8	92.8	92.8	92.8	91.9	88.8	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	Carbon steel	Bolting	SA-325	...	...	...	...	105
2	Carbon steel	Bolting	SA-325	1	K02706	...	$1\frac{1}{8} \leq t \leq 1\frac{1}{2}$	105
3	Carbon steel	Bolting	SA-449	...	K04200	...	$1 < t < 1\frac{1}{2}$	105
4	Carbon steel	Bolting	SA-354	BC	K04100	...	$2\frac{1}{2} < t \leq 4$	115
5	Carbon steel	Bolting	SA-325	1	K02706	...	$\frac{1}{2} \leq t \leq 1$	120
6	Carbon steel	Bolting	SA-449	...	K04200	...	≤ 1	120
7	Carbon steel	Bolting	SA-354	BC	K04100	...	$\frac{1}{4} < t \leq 2\frac{1}{2}$	125
8	Carbon steel	Bolting	SA-354	BD	K04100	...	$2\frac{1}{2} < t \leq 4$	140
9	Carbon steel	Bolting	SA-354	BD	K04100	...	$\frac{1}{4} < t \leq 2\frac{1}{2}$	150
10	Ductile cast iron	Castings	SA-874	...	...	...	$12 < t < 21$	43.5
11	Ductile cast iron	Castings	SA/JIS G5504	FCD 300 LT	...	...	$12 < t < 21$	43.5
12	C-Mn-Si-Cb	Plate	SA-737	B	K12001	...	...	70
13	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490	...	...	≤ 6	71
14	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$2.5 < t \leq 4$	74
15	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$1.5 < t \leq 2.5$	75.5
16	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized	$0.4 < t \leq 1.5$	77
17	C-Mn-Si-V	Plate	SA-737	C	K12202	...	...	80
18	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	≤ 2	60
19	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	≤ 2	60
20	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	$\leq 1\frac{1}{2}$	70
21	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	$\leq 1\frac{1}{2}$	70
22	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	≤ 1	80
23	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	≤ 1	80
24	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...	$\leq \frac{3}{4}$	90
25	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...	$\leq \frac{3}{4}$	90
26	C-Mn-Ti	Plate, sheet	SA-562	...	K11224	...	...	55
27	C-Si-Ti	Forgings	SA-836	...	...	1	...	55
28	C- $\frac{1}{4}$ Mo	Bolting	SA-320	L7A	G40370	...	$\leq 2\frac{1}{2}$	125
29	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4037	G40370	...	$\geq \frac{5}{8}$	170
30	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4042	G40420	...	$\geq \frac{5}{8}$	170
31	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4140	G41400	...	$\geq \frac{5}{8}$	170
32	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4037	G40370	...	$\leq \frac{1}{2}$	180
33	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4042	G40420	...	$\leq \frac{1}{2}$	180
34	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...	$t \leq 2\frac{1}{2}$	65.5
35	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1b	K11422	...	...	53
36	C- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T1b	K11422	...	...	53
37	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1	K11522	...	...	55
38	C- $\frac{1}{2}$ Mo	Smls. & wld. ftgs.	SA-234	WP1	K12821	...	...	55
39	C- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T1	K11522	...	...	55
40	C- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P1	K11522	...	...	55
41	C- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP1	K11522	...	...	55
42	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1a	K12023	...	...	60
43	C- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T1a	K12023	...	...	60
44	C- $\frac{1}{2}$ Mo	Castings	SA-217	WC1	J12524	...	...	65
45	C- $\frac{1}{2}$ Mo	Castings	SA-352	LC1	J12522	...	...	65

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	105.0	105.0	103.6	102.6	102.5	102.5	102.5	102.5	101.5	98.1	91.5	80.3	62.5	35.8
2	105.0	105.0	103.6	102.6	102.5	102.5	102.5	102.5	101.5	98.1	91.5	80.3	62.5	35.8
3	105.0	105.0	103.6	102.6	102.5	102.5	102.5	102.5	101.5	98.1	91.5	80.3	62.5	35.8
4	115.0	115.0	115.0	115.0	115.0	115.0	115.0	113.6	105.7	96.2	85.8	75.4	66.3	...
5	120.0	120.0	118.4	117.3	117.2	117.2	117.2	117.2	116.1	112.1	104.6	91.8	71.5	41.0
6	120.0	120.0	118.4	117.3	117.2	117.2	117.2	117.2	116.1	112.1	104.6	91.8	71.5	41.0
7	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	123.5	114.8	104.6	93.3	82.0	72.1
8	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	138.3	128.6	117.1	104.5	91.8	80.7
9	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	147.8	137.3	124.9	111.3	97.6	85.5
10	43.5	43.4	41.3	39.9	39.1	38.4	37.6	...	...	...	...	...	...	...
11	43.5	43.4	41.3	39.9	39.1	38.4	37.6	...	...	...	...	...	...	...
12	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.4	66.7	63.0	58.2	52.7	47.0	...
13	71.0	71.0	71.0	71.0	71.0	71.0	71.0	70.4	67.7	63.9	59.1	53.5	47.6	42.2
14	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	70.9	66.4	61.1	55.4	49.6	44.0
15	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	72.3	67.7	62.3	56.5	50.6	45.0
16	76.9	76.9	76.9	76.9	76.9	76.9	76.9	76.9	73.7	69.0	63.5	57.6	51.5	45.9
17	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.4	76.3	72.0	66.5	60.3	53.7	...
18	60.0	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...	...	...	...	...
19	60.0	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...	...	...	...	...
20	70.0	70.0	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...
21	70.0	70.0	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...
22	80.0	80.0	80.0	80.0	80.0	80.0	80.0	...	...	...	...	...	...	...
23	80.0	80.0	80.0	80.0	80.0	80.0	80.0	...	...	...	...	...	...	...
24	90.0	90.0	90.0	90.0	90.0	90.0	90.0	...	...	...	...	...	...	...
25	90.0	90.0	90.0	90.0	90.0	90.0	90.0	...	...	...	...	...	...	...
26	55.0	44.4	41.5	39.5	38.1	36.9	36.3	35.6	34.8	...	...	...	...	...
27	55.0	54.3	50.7	48.3	46.6	45.1	44.3	43.5	42.5	...	...	...	...	...
28	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	123.5	114.8	104.6	93.3	82.0	72.1
29	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	166.0	158.1	148.4	137.2
30	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	166.0	158.1	148.4	137.2
31	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	166.0	158.1	148.4	137.2
32	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	175.8	167.4	157.2	145.3
33	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	175.8	167.4	157.2	145.3
34	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	63.7	60.7	57.0	52.7
35	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	51.8	49.3	46.3	42.8
36	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	51.8	49.3	46.3	42.8
37	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
38	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
39	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
40	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
41	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
42	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.6	55.8	52.4	48.4
43	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.6	55.8	52.4	48.4
44	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	63.5	60.4	56.8	52.5
45	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	63.5	60.4	56.8	52.5

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
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9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
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12	...	...	...	...	...	...	...	...	...	...	...	...	...
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14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	C- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP1	J12521	...	...	65
2	C- $\frac{1}{2}$ Mo	Plate	SA-204	A	K11820	...	...	65
3	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L65	K11820	...	...	65
4	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-65	K11820	...	...	65
5	C- $\frac{1}{2}$ Mo	Forgings	SA-182	F1	K12822	...	...	70
6	C- $\frac{1}{2}$ Mo	Plate	SA-204	B	K12020	...	...	70
7	C- $\frac{1}{2}$ Mo	Forgings	SA-336	F1	K12520	...	...	70
8	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L70	K12020	...	...	70
9	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-70	K12020	...	...	70
10	C- $\frac{1}{2}$ Mo	Plate	SA-204	C	K12320	...	...	75
11	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L75	K12320	...	...	75
12	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-75	K12320	...	...	75
13	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	55	...	85
14	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	55	...	85
15	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	65	...	105
16	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	65	...	105
17	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13547	70	...	120
18	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	70	...	120
19	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo-V	Plate	SA-517	B	K11630	...	$\leq 1\frac{1}{4}$	115
20	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Plate	SA-517	A	K11856	...	$\leq 1\frac{1}{4}$	115
21	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Forgings	SA-592	A	K11856	...	$\leq 2\frac{1}{2}$	115
22	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P2	K11547	...	...	55
23	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP2	K11547	...	...	55
24	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143	1	...	55
25	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143	...	...	55
26	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T2	K11547	...	...	60
27	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP2	J11547	...	...	60
28	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F2	K12122	...	...	70
29	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143	2	...	70
30	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143	...	...	70
31	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Ni-Cu	Wld. tube	SA-423	1	K11535	...	...	60
32	$\frac{3}{4}$ Cr- $\frac{3}{4}$ Ni-Cu-Al	Pipe	SA-333	4	K11267	...	...	60
33	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047	55	...	85
34	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	55	...	85
35	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548	55	...	85
36	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...	$4 < t \leq 7$	100
37	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7M	G41400	...	$\leq 2\frac{1}{2}$	100
38	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-320	L7M	G41400	...	$\leq 2\frac{1}{2}$	100
39	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	65	...	105
40	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...	$2\frac{1}{2} < t \leq 4$	115
41	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047	70	...	120
42	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	70	...	120
43	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548	70	...	120
44	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...	$\leq 2\frac{1}{2}$	125
45	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-320	L7	G41400	...	$\leq 2\frac{1}{2}$	125

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	63.5	60.4	56.8	52.5
2	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	63.5	60.4	56.8	52.5
3	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	63.5	60.4	56.8	52.5
4	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	63.5	60.4	56.8	52.5
5	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
6	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
7	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
8	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
9	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
10	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	73.2	69.7	65.5	60.5
11	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	73.2	69.7	65.5	60.5
12	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	73.2	69.7	65.5	60.5
13	85.0	85.0	85.0	85.0	85.0	85.0	85.0	82.2	78.2	73.8	68.9	63.8	58.7	53.6
14	85.0	85.0	85.0	85.0	85.0	85.0	85.0	82.2	78.2	73.8	68.9	63.8	58.7	53.6
15	105.0	105.0	105.0	105.0	105.0	105.0	105.0	102.0	96.6	91.1	85.2	78.9	72.5	66.3
16	105.0	105.0	105.0	105.0	105.0	105.0	105.0	102.0	96.6	91.1	85.2	78.9	72.5	66.3
17	120.0	120.0	120.0	120.0	120.0	120.0	119.2	115.2	110.3	104.4	97.7	90.4	82.9	75.5
18	120.0	120.0	120.0	120.0	120.0	120.0	119.2	115.2	110.3	104.4	97.7	90.4	82.9	75.5
19	115.0	115.0	115.0	115.0	115.0	115.0	114.8	112.6	109.6	106.0	101.6	96.6	90.8	84.4
20	115.0	115.0	115.0	115.0	115.0	115.0	114.8	112.6	109.6	106.0	101.6	96.6	90.8	84.4
21	115.0	115.0	115.0	115.0	115.0	115.0	114.8	112.6	109.6	106.0	101.6	96.6	90.8	84.4
22	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
23	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
24	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
25	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.7	51.1	48.0	44.4
26	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.6	55.8	52.4	48.4
27	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.6	55.8	52.4	48.4
28	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
29	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
30	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.4	65.1	61.1	56.5
31	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...
32	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	...	...	...
33	85.0	85.0	85.0	85.0	85.0	85.0	85.0	82.2	78.2	73.8	68.9	63.8	58.7	53.6
34	85.0	85.0	85.0	85.0	85.0	85.0	85.0	82.2	78.2	73.8	68.9	63.8	58.7	53.6
35	85.0	85.0	85.0	85.0	85.0	85.0	85.0	82.2	78.2	73.8	68.9	63.8	58.7	53.6
36	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	91.4	86.7	81.4	75.7	69.4	62.7
37	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	91.4	86.7	81.4	75.7	69.4	62.7
38	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	91.4	86.7	81.4	75.7	69.4	62.7
39	105.0	105.0	105.0	105.0	105.0	105.0	105.0	102.0	96.6	91.1	85.2	78.9	72.5	66.3
40	115.0	115.0	115.0	115.0	115.0	115.0	114.5	110.1	105.1	99.7	93.6	87.0	79.8	72.1
41	120.0	120.0	120.0	120.0	120.0	120.0	119.2	115.2	110.3	104.4	97.7	90.4	82.9	75.5
42	120.0	120.0	120.0	120.0	120.0	120.0	119.2	115.2	110.3	104.4	97.7	90.4	82.9	75.5
43	120.0	120.0	120.0	120.0	120.0	120.0	119.2	115.2	110.3	104.4	97.7	90.4	82.9	75.5
44	125.0	125.0	125.0	125.0	125.0	125.0	124.4	119.6	114.3	108.4	101.8	94.6	86.8	78.4
45	125.0	125.0	125.0	125.0	125.0	125.0	124.4	119.6	114.3	108.4	101.8	94.6	86.8	78.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	J	G41370	110	...	135
2	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	1	...	55
3	1Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	1CR	K11757	...	...	55
4	1Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP12	J11562	...	...	60
5	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11562	1	...	60
6	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T12	K11562	...	...	60
7	1Cr- $\frac{1}{2}$ Mo	Smls. & wld. ftgs.	SA-234	WP12	K12062	1	...	60
8	1Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P12	K11562	...	...	60
9	1Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP12	K11562	...	...	60
10	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$10 < t \leq 20$	61
11	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$6 < t \leq 10$	61
12	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$4 < t \leq 6$	62.5
13	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$2.5 < t \leq 4$	64
14	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA/EN 10216-2	13CrMo4-5	...	...	$t \leq 2\frac{1}{2}$	64
15	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	...	$4 < t \leq 8$	64
16	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT	$t \leq 10$	64
17	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	2	...	65
18	1Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	1CR	K11757	...	...	65
19	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...	$t \leq 2.5$	65.5
20	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	...	$0.25 \leq t \leq 4$	65.5
21	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11564	2	...	70
22	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F12	K11564	...	...	70
23	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...	$4 < t \leq 8$	100
24	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...	$2\frac{1}{2} < t \leq 4$	110
25	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	5	$2 < t \leq 8$	115
26	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	5	≤ 2	120
27	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...	$\leq 2\frac{1}{2}$	125
28	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	4	≤ 6	135
29	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	3	≤ 6	145
30	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	2	≤ 4	155
31	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	1	≤ 4	165
32	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.020	300
33	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.020	300
34	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.032	290
35	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.032	290
36	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.041	280
37	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.041	280
38	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.054	270
39	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.054	270
40	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.062	265
41	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.062	265
42	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.080	255
43	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.080	255
44	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.105	245
45	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.105	245

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	135.0	135.0	135.0	135.0	135.0	135.0	134.1	129.7	124.0	117.4	109.9	101.7	93.3	85.0
2	55.0	54.0	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9	51.4	48.9	45.8
3	55.0	54.0	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9	51.4	48.9	45.8
4	60.0	58.9	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	56.1	53.3	50.0
5	60.0	58.9	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	56.1	53.3	50.0
6	60.0	58.9	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	56.1	53.3	50.0
7	60.0	58.9	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	56.1	53.3	50.0
8	60.0	58.9	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	56.1	53.3	50.0
9	60.0	58.9	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	56.1	53.3	50.0
10	60.9	60.2	58.5	58.1	58.1	58.1	58.1	58.1	58.1	58.1	57.8	56.5	54.1	50.2
11	60.9	59.8	58.8	58.6	58.6	58.5	58.5	58.5	58.5	58.5	58.3	57.0	54.5	49.9
12	62.4	61.2	60.2	60.0	59.9	59.9	59.9	59.9	59.9	59.9	59.6	58.4	55.8	51.1
13	63.8	62.7	61.6	61.4	61.3	61.3	61.3	61.3	61.3	61.3	61.0	59.7	57.1	52.3
14	63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8	62.0	59.3	55.9	51.9
15	63.8	62.7	61.6	61.4	61.3	61.3	61.3	61.3	61.3	61.3	61.0	59.7	57.1	52.3
16	63.8	63.0	61.3	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.5	59.2	56.7	52.6
17	65.0	63.8	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	60.8	57.8	54.2
18	65.0	63.8	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	60.8	57.8	54.2
19	65.3	64.1	63.0	62.8	62.7	62.7	62.7	62.7	62.7	62.7	62.4	61.1	58.4	53.5
20	65.3	64.1	63.0	62.8	62.7	62.7	62.7	62.7	62.7	62.7	62.4	61.1	58.4	53.5
21	70.0	68.7	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	65.5	62.2	58.3
22	70.0	68.7	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	65.5	62.2	58.3
23	100.0	100.0	100.0	100.0	100.0	100.0	98.7	95.8	92.5	88.8	84.7	80.2	75.5	70.4
24	110.0	110.0	110.0	110.0	110.0	110.0	108.5	105.4	101.8	97.7	93.1	88.2	83.0	77.4
25	115.0	115.0	115.0	115.0	115.0	115.0	113.9	109.8	106.3	101.8	97.2	91.7	87.0	81.6
26	120.0	120.0	120.0	120.0	120.0	120.0	118.8	114.6	110.9	106.3	101.4	95.7	90.8	85.1
27	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	125.0	99.7	94.6	88.7
28	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	124.7	119.5	114.0	107.7	102.2	95.8
29	145.0	145.0	145.0	145.0	145.0	145.0	143.6	138.4	134.0	128.4	122.5	115.6	109.7	102.9
30	155.0	155.0	155.0	155.0	155.0	155.0	153.5	148.0	143.2	137.3	130.9	123.6	117.3	110.0
31	165.0	165.0	165.0	165.0	165.0	165.0	163.4	157.5	152.5	146.1	139.4	131.6	124.9	117.1
32	300	...	...	...	...	...	...	...	...	...	...	...	...	...
33	300	...	...	...	...	...	...	...	...	...	...	...	...	...
34	290	...	...	...	...	...	...	...	...	...	...	...	...	...
35	290	...	...	...	...	...	...	...	...	...	...	...	...	...
36	280	...	...	...	...	...	...	...	...	...	...	...	...	...
37	280	...	...	...	...	...	...	...	...	...	...	...	...	...
38	270	...	...	...	...	...	...	...	...	...	...	...	...	...
39	270	...	...	...	...	...	...	...	...	...	...	...	...	...
40	265	...	...	...	...	...	...	...	...	...	...	...	...	...
41	265	...	...	...	...	...	...	...	...	...	...	...	...	...
42	255	...	...	...	...	...	...	...	...	...	...	...	...	...
43	255	...	...	...	...	...	...	...	...	...	...	...	...	...
44	245	...	...	...	...	...	...	...	...	...	...	...	...	...
45	245	...	...	...	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.135	235
2	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.135	235
3	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.162	225
4	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.162	225
5	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.192	220
6	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.192	220
7	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.244	210
8	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.244	210
9	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.283	205
10	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.283	205
11	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.312	203
12	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.312	203
13	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.375	200
14	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.375	200
15	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.438	195
16	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.438	195
17	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-231	...	...	Oil	0.500	190
18	1Cr- $\frac{1}{4}$ Si-V	Wire	SA-232	...	...	Oil	0.500	190
19	1Cr-V	Smls. tube	SA-213	T17	K12047	...	...	60
20	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC6	J12072	...	...	70
21	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP11	J12072	...	...	70
22	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Bar	SA-739	B11	K11797	...	...	70
23	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11597	1	...	60
24	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T11	K11597	...	...	60
25	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. & wld. ftgs.	SA-234	WP11	...	1	...	60
26	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P11	K11597	...	...	60
27	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11597	1	...	60
28	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forged pipe	SA-369	FP11	K11597	...	...	60
29	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	1	...	60
30	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...	...	60
31	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11572	2	...	70
32	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	2	...	70
33	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	$4 < t \leq 10$	71
34	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	$2.25 < t \leq 4$	72.5
35	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT	≤ 2.25	74
36	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	3	...	75
37	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	2	...	75
38	$\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...	...	75
39	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...	$2\frac{1}{2} < t \leq 4$	105
40	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...	$\leq 2\frac{1}{2}$	115
41	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...	$2\frac{1}{2} < t \leq 6$	105
42	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...	$\leq 2\frac{1}{2}$	115
43	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	1	...	60
44	$2\frac{1}{4}$ Cr-1Mo	Smls. tube	SA-213	T22	K21590	...	...	60
45	$2\frac{1}{4}$ Cr-1Mo	Smls. & wld. ftgs.	SA-234	WP22	K21590	1	...	60

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	235	...	...	...	...	...	...	...	...	...	...	...	...	...
2	235	...	...	...	...	...	...	...	...	...	...	...	...	...
3	225	...	...	...	...	...	...	...	...	...	...	...	...	...
4	225	...	...	...	...	...	...	...	...	...	...	...	...	...
5	220	...	...	...	...	...	...	...	...	...	...	...	...	...
6	220	...	...	...	...	...	...	...	...	...	...	...	...	...
7	210	...	...	...	...	...	...	...	...	...	...	...	...	...
8	210	...	...	...	...	...	...	...	...	...	...	...	...	...
9	205	...	...	...	...	...	...	...	...	...	...	...	...	...
10	205	...	...	...	...	...	...	...	...	...	...	...	...	...
11	203	...	...	...	...	...	...	...	...	...	...	...	...	...
12	203	...	...	...	...	...	...	...	...	...	...	...	...	...
13	200	...	...	...	...	...	...	...	...	...	...	...	...	...
14	200	...	...	...	...	...	...	...	...	...	...	...	...	...
15	195	...	...	...	...	...	...	...	...	...	...	...	...	...
16	195	...	...	...	...	...	...	...	...	...	...	...	...	...
17	190	...	...	...	...	...	...	...	...	...	...	...	...	...
18	190	...	...	...	...	...	...	...	...	...	...	...	...	...
19	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
20	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.0	65.1	61.4	56.9
21	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.0	65.1	61.4	56.9
22	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.0	65.1	61.4	56.9
23	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
24	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
25	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
26	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
27	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
28	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
29	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
30	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	58.3	55.8	52.6	48.8
31	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.0	65.1	61.4	56.9
32	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	68.0	65.1	61.4	56.9
33	71.1	71.1	70.3	70.3	70.3	70.3	70.3	70.3	70.3	69.3	66.9	63.9	60.4	56.2
34	72.5	72.5	71.8	71.8	71.8	71.8	71.8	71.8	71.8	70.8	68.3	65.3	61.6	57.4
35	74.0	74.0	73.2	73.2	73.2	73.2	73.2	73.2	73.2	72.2	69.7	66.6	62.8	58.5
36	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	72.8	69.7	65.7	61.0
37	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	72.8	69.7	65.7	61.0
38	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	72.8	69.7	65.7	61.0
39	105.0	105.0	105.0	105.0	105.0	105.0	105.0	104.6	102.7	100.4	97.7	94.8	91.5	88.1
40	115.0	115.0	115.0	115.0	115.0	115.0	115.0	114.6	112.5	110.0	107.0	103.8	100.2	96.5
41	105.0	105.0	105.0	105.0	105.0	105.0	105.0	104.6	102.7	100.4	97.7	94.8	91.5	88.1
42	115.0	115.0	115.0	115.0	115.0	115.0	115.0	114.6	112.5	110.0	107.0	103.8	100.2	96.5
43	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
44	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
45	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	2 $\frac{1}{4}$ Cr-1Mo	Smls. pipe	SA-335	P22	K21590	...	...	60
2	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	1	...	60
3	2 $\frac{1}{4}$ Cr-1Mo	Forged pipe	SA-369	FP22	K21590	...	...	60
4	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	1	...	60
5	2 $\frac{1}{4}$ Cr-1Mo	Wld. pipe	SA-691	2 $\frac{1}{4}$ CR	K21590	...	...	60
6	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	6 < t ≤ 10	65.5
7	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT or QT	8 < t ≤ 20	65.5
8	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	4 < t ≤ 6	66.5
9	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	2.5 < t ≤ 4	68
10	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...	t ≤ 2.5	69.5
11	2 $\frac{1}{4}$ Cr-1Mo	Smls. tube	SA/EN 10216-2	10CrMo9-10	...	...	t ≤ 2 $\frac{1}{2}$	69.5
12	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-217	WC9	J21890	...	...	70
13	2 $\frac{1}{4}$ Cr-1Mo	Cast pipe	SA-426	CP22	J21890	...	...	70
14	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	3	...	75
15	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	3	...	75
16	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	2	...	75
17	2 $\frac{1}{4}$ Cr-1Mo	Wld. pipe	SA-691	2 $\frac{1}{4}$ CR	K21590	...	...	75
18	2 $\frac{1}{4}$ Cr-1Mo	Bar	SA-739	B22	K21390	...	...	75
19	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT	t ≤ 8	75.5
20	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-487	8	J22091	A	...	85
21	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-508	22	K21590	3	...	85
22	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	3	...	85
23	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-542	B	K21590	4	...	85
24	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	4	...	105
25	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-182	F22V	K31835	...	...	85
26	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-336	F22V	K31835	...	...	85
27	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-541	22V	K31835	...	...	85
28	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-542	D	K31835	4a	...	85
29	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-832	22V	K31835	...	...	85
30	3Cr-1Mo	Smls. tube	SA-213	T21	K31545	...	...	60
31	3Cr-1Mo	Smls. pipe	SA-335	P21	K31545	...	...	60
32	3Cr-1Mo	Forgings	SA-336	F21	K31545	1	...	60
33	3Cr-1Mo	Forged pipe	SA-369	FP21	K31545	...	...	60
34	3Cr-1Mo	Plate	SA-387	21	K31545	1	...	60
35	3Cr-1Mo	Cast pipe	SA-426	CP21	J31545	...	...	60
36	3Cr-1Mo	Forgings	SA-182	F21	K31545	...	...	75
37	3Cr-1Mo	Forgings	SA-336	F21	K31545	3	...	75
38	3Cr-1Mo	Plate	SA-387	21	K31545	2	...	75
39	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-182	F3V	K31830	...	...	85
40	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-336	F3V	K31830	...	...	85
41	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-508	3V	K31830	...	...	85
42	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-541	3V	K31830	...	...	85
43	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-542	C	K31830	4a	...	85
44	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-832	21V	K31830	...	...	85
45	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-182	F3VCb	...	...	...	85

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
2	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
3	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
4	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
5	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
6	65.3	65.3	63.5	62.9	62.6	62.1	61.6	61.0	60.0	58.8	57.1	54.8	51.9	48.2
7	65.3	65.3	64.0	63.0	62.7	62.4	62.0	61.4	60.4	59.0	57.2	54.9	52.1	48.8
8	66.7	66.7	65.0	64.3	64.0	63.5	63.0	62.3	61.4	60.1	58.3	56.1	53.1	49.3
9	68.2	68.2	66.4	65.7	65.4	64.9	64.4	63.7	62.7	61.4	59.6	57.3	54.2	50.4
10	69.6	69.6	67.8	67.1	66.7	66.2	65.8	65.0	64.1	62.7	60.9	58.5	55.4	51.4
11	69.6	69.6	67.8	67.1	66.7	66.2	65.7	65.0	64.0	62.7	60.9	58.5	55.4	51.5
12	70.0	70.0	69.0	67.9	67.6	67.3	66.8	66.0	64.6	62.7	60.1	56.9	52.8	48.1
13	70.0	70.0	69.0	67.9	67.6	67.3	66.8	66.0	64.6	62.7	60.1	56.9	52.8	48.1
14	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
15	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
16	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
17	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
18	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
19	75.4	75.4	74.0	72.8	72.4	72.1	71.6	70.9	69.8	68.2	66.1	63.4	60.2	56.4
20	85.0	85.0	83.0	82.2	82.1	81.7	81.1	80.0	78.4	76.1	73.0	69.0	64.1	58.2
21	85.0	85.0	84.9	84.9	83.5	81.7	81.0	80.3	79.1	76.5	71.4	...	...	...
22	85.0	85.0	84.9	84.9	83.5	81.7	81.0	80.3	79.1	76.5	71.4	...	...	...
23	85.0	85.0	84.9	84.9	83.5	81.7	81.0	80.3	79.1	76.5	71.4	...	...	...
24	105.0	105.0	105.0	105.0	104.3	103.0	102.1	100.9	99.4	97.5	95.0	92.1	88.5	84.4
25	85.0	85.0	85.0	85.0	85.0	82.8	81.3	79.6	77.7	75.6	73.4	71.0	...	...
26	85.0	85.0	85.0	85.0	85.0	82.8	81.3	79.6	77.7	75.6	73.4	71.0	...	...
27	85.0	85.0	85.0	85.0	85.0	82.8	81.3	79.6	77.7	75.6	73.4	71.0	...	...
28	85.0	85.0	85.0	85.0	85.0	82.8	81.3	79.6	77.7	75.6	73.4	71.0	...	...
29	85.0	85.0	85.0	85.0	85.0	82.8	81.3	79.6	77.7	75.6	73.4	71.0	...	...
30	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
31	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
32	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
33	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
34	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
35	60.0	59.9	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	57.5	53.9
36	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
37	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
38	75.0	75.0	73.0	72.2	71.9	71.4	70.8	70.1	69.0	67.5	65.6	63.0	59.7	55.4
39	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
40	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
41	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
42	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
43	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
44	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
45	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-336	F3VCb	...	...	...	85
2	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-508	3VCb	...	...	...	85
3	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-541	3VCb	...	...	...	85
4	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-542	E	...	4a	...	85
5	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-832	23V	...	...	...	85
6	5Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T5	K41545	...	...	60
7	5Cr- $\frac{1}{2}$ Mo	Smls. & wld. ftgs.	SA-234	WP5	K41545	...	...	60
8	5Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P5	K41545	...	...	60
9	5Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP5	K41545	...	...	60
10	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	1	...	60
11	5Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	5CR	K41545	...	...	60
12	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5	K41545	...	...	60
13	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5	K41545	...	...	70
14	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	2	...	75
15	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5A	K42544	...	...	80
16	5Cr- $\frac{1}{2}$ Mo	Castings	SA-217	C5	J42045	...	...	90
17	5Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP5	J42045	...	...	90
18	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5a	K42544	...	...	90
19	5Cr- $\frac{1}{2}$ Mo	Bolting	SA-193	B5	K50100	...	≤ 4	100
20	5Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T5b	K51545	...	...	60
21	5Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P5b	K51545	...	...	60
22	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. tube	SA-213	T5c	K41245	...	...	60
23	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. pipe	SA-335	P5c	K41245	...	...	60
24	9Cr-1Mo	Smls. tube	SA-213	T9	K90941	...	...	60
25	9Cr-1Mo	Fittings	SA-234	WP9	K90941	...	...	60
26	9Cr-1Mo	Smls. pipe	SA-335	P9	K90941	...	...	60
27	9Cr-1Mo	Forged pipe	SA-369	FP9	K90941	...	...	60
28	9Cr-1Mo	Forgings	SA-182	F9	K90941	...	...	85
29	9Cr-1Mo	Forgings	SA-336	F9	K90941	...	...	85
30	9Cr-1Mo	Castings	SA-217	C12	J82090	...	...	90
31	9Cr-1Mo	Cast pipe	SA-426	CP9	J82090	...	...	90
(23) 32	9Cr-1Mo-V	Smls. tube	SA-213	T91 Types 1 & 2	K90901	...	...	85
(23) 33	9Cr-1Mo-V	Fittings	SA-234	WP91 Types 1 & 2	K90901	...	...	90
34	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Types 1 & 2	K90901	...	...	85
35	9Cr-1Mo-V	Forged pipe	SA-369	FP91 Types 1 & 2	K90901	...	...	85
36	9Cr-1Mo-V	Plate	SA-387	91 Types 1 & 2	K90901	2	...	85
37	9Cr-1Mo-V	Forgings	SA-182	F91 Types 1 & 2	K90901	...	...	90
38	9Cr-1Mo-V	Forgings	SA-336	F91 Types 1 & 2	K90901	...	...	90
39	11Cr-Ti	Plate	SA-240	...	S40910	...	...	55
40	11Cr-Ti	Plate	SA-240	...	S40920	...	...	55
41	11Cr-Ti	Plate	SA-240	...	S40930	...	...	55
42	11Cr-Ti	Smls. & wld. tube	SA-268	TP409	S40900	...	...	55
43	12Cr	Plate	SA-1010	40	S41003	...	$\leq \frac{3}{4}$	66
44	12Cr	Bar	SA-479	403	S40300	A	...	70
45	12Cr	Bar	SA-479	403	S40300	1	...	70

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
2	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
3	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
4	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
5	85.0	85.0	81.5	79.0	77.5	76.4	75.7	75.0	74.1	72.9	71.4	69.8	...	...
6	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
7	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
8	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
9	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
10	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
11	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
12	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
13	70.0	69.9	67.8	67.3	67.1	66.1	65.1	63.7	61.8	59.4	56.5	53.2	49.5	45.5
14	75.0	74.8	72.7	72.1	71.9	70.8	69.7	68.2	66.2	63.6	60.6	57.0	53.1	48.7
15	80.0	79.8	77.5	76.9	76.7	75.5	74.4	72.8	70.6	67.9	64.6	60.9	56.6	52.0
16	90.0	89.8	87.2	86.5	86.2	85.0	83.7	81.9	79.4	76.4	72.7	68.5	63.7	58.5
17	90.0	89.8	87.2	86.5	86.2	85.0	83.7	81.9	79.4	76.4	72.7	68.5	63.7	58.5
18	90.0	89.8	87.2	86.5	86.2	85.0	83.7	81.9	79.4	76.4	72.7	68.5	63.7	58.5
19	100.0	99.6	96.8	95.7	95.5	94.1	92.6	91.1	88.0	85.3	81.2	76.5	71.7	66.0
20	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
21	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
22	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
23	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
24	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
25	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
26	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
27	60.0	59.9	58.1	57.7	57.5	56.7	55.8	54.6	52.9	50.9	48.5	45.6	42.5	39.0
28	85.0	84.8	82.3	81.7	81.4	80.3	79.0	77.3	75.0	72.1	68.7	64.7	60.1	55.2
29	85.0	84.8	82.3	81.7	81.4	80.3	79.0	77.3	75.0	72.1	68.7	64.7	60.1	55.2
30	90.0	89.8	87.2	86.5	86.2	85.0	83.7	81.9	79.4	76.4	72.7	68.5	63.7	58.5
31	90.0	89.8	87.2	86.5	86.2	85.0	83.7	81.9	79.4	76.4	72.7	68.5	63.7	58.5
32	85.0	85.0	85.0	84.7	84.4	83.1	81.8	80.0	77.6	74.7	71.1	66.9	62.2	57.0
33	90.0	90.0	90.0	89.7	89.4	88.0	86.6	84.7	82.2	79.1	75.3	70.8	65.9	60.4
34	85.0	85.0	85.0	84.7	84.4	83.1	81.8	80.0	77.6	74.7	71.1	66.9	62.2	57.0
35	85.0	85.0	85.0	84.7	84.4	83.1	81.8	80.0	77.6	74.7	71.1	66.9	62.2	57.0
36	85.0	85.0	85.0	84.7	84.4	83.1	81.8	80.0	77.6	74.7	71.1	66.9	62.2	57.0
37	90.0	90.0	90.0	89.7	89.4	88.0	86.6	84.7	82.2	79.1	75.3	70.8	65.9	60.4
38	90.0	90.0	90.0	89.7	89.4	88.0	86.6	84.7	82.2	79.1	75.3	70.8	65.9	60.4
39	55.0	55.0	53.9	53.0	52.1	50.9	49.9	48.6	47.1	45.2	42.9	40.3	37.4	34.1
40	55.0	55.0	53.9	53.0	52.1	50.9	49.9	48.6	47.1	45.2	42.9	40.3	37.4	34.1
41	55.0	55.0	53.9	53.0	52.1	50.9	49.9	48.6	47.1	45.2	42.9	40.3	37.4	34.1
42	55.0	55.0	53.9	53.0	52.1	50.9	49.9	48.6	47.1	45.2	42.9	40.3	37.4	34.1
43	66.0	66.0	66.0	64.3	62.1	59.8	58.5	56.9	55.0	52.6	49.7	46.1	41.8	36.7
44	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5
45	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	12Cr	Plate	SA-1010	50	S41003	...	$\leq \frac{3}{4}$	70
2	12Cr-Al	Plate	SA-240	405	S40500	...	...	60
3	12Cr-Al	Smls. & wld. tube	SA-268	TP405	S40500	...	...	60
4	12Cr-Al	Bar	SA-479	405	S40500	...	...	60
5	12Cr-Al	Bar	SA/JIS G4303	SUS405	...	...	...	60
6	12Cr-Ti	Smls. & wld. tube	SA-268	...	S40800	...	...	55
7	12Cr-9Ni-2Cu-1Ti	Bar	SA-564	XM-16	S45500	H1000	...	205
8	12Cr-9Ni-2Cu-1Ti	Forgings	SA-705	XM-16	S45500	H1000	$t \geq \frac{1}{2}$	205
9	12Cr-9Ni-2Cu-1Ti	Bar	SA-564	XM-16	S45500	H950	...	220
10	12Cr-9Ni-2Cu-1Ti	Forgings	SA-705	XM-16	S45500	H950	$t \geq \frac{1}{2}$	220
11	12Cr-9Ni-2Cu-1Ti	Bar	SA-564	XM-16	S45500	H900	...	235
12	12Cr-9Ni-2Cu-1Ti	Forgings	SA-705	XM-16	S45500	H900	$t \geq \frac{1}{2}$	235
13	13Cr	Plate	SA-240	410S	S41008	...	...	60
14	13Cr	Smls. & wld. tube	SA-268	TP410	S41000	...	...	60
15	13Cr	Plate	SA-240	410	S41000	...	...	65
16	13Cr	Forgings	SA-182	F6a	S41000	1	...	70
17	13Cr	Bar	SA-479	410	S41000	...	...	70
18	13Cr	Bar	SA-479	410	S41000	A	...	70
19	13Cr	Bar	SA-479	410	S41000	1	...	70
20	13Cr	Forgings	SA-182	F6a	S41000	2	...	85
21	13Cr	Castings	SA-217	CA15	J91150	...	...	90
22	13Cr	Cast pipe	SA-426	CPCA15	J91150	...	...	90
23	13Cr	Bar	SA/EN 10088-3	X12Cr13	...	QT650	$t \leq 6.25$	94.5
24	13Cr	Bolting	SA-193	B6	S41000	...	≤ 4	110
25	13Cr-4Ni	Castings	SA-487	CA6NM	J91540	A	...	110
26	13Cr-4Ni	Forgings	SA-182	F6NM	S41500	...	...	115
27	13Cr-4Ni	Bar	SA-479	...	S41500	...	...	115
28	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1150M	...	125
29	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1150M	...	125
30	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1150	...	135
31	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1150	...	135
32	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1100	...	150
33	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1100	...	150
34	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1050	...	175
35	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1050	...	175
36	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1025	...	185
37	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1025	...	185
38	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1000	...	205
39	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1000	...	205
40	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H950	...	220
41	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H950	...	220
42	15Cr	Smls. & wld. tube	SA-268	TP429	S42900	...	...	60
43	15Cr	Plate	SA-240	429	S42900	...	...	65
44	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1150M	...	115
45	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1150M	...	115

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	70.0	70.0	70.0	68.2	65.8	63.4	62.0	60.4	58.3	55.8	52.7	48.9	44.3	38.9
2	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
3	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
4	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
5	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
6	55.0	55.0	53.9	53.0	52.1	50.9	49.9	48.6	47.1	45.2	42.9	40.3	37.4	34.1
7	205.0	...	...	...	...	...	...	...	...	...	...	...	...	...
8	205.0	...	...	...	...	...	...	...	...	...	...	...	...	...
9	220.0	...	...	...	...	...	...	...	...	...	...	...	...	...
10	220.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	235.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	235.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
14	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
15	65.0	65.0	63.7	62.6	61.6	60.1	59.0	57.5	55.6	53.4	50.7	47.7	44.2	40.3
16	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5
17	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5
18	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5
19	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5
20	85.0	85.0	83.3	81.8	80.6	78.6	77.1	75.2	72.8	69.8	66.3	62.3	57.8	52.8
21	90.0	90.0	88.2	86.7	85.3	83.2	81.6	79.6	77.0	73.9	70.2	66.0	61.2	55.9
22	90.0	90.0	88.2	86.7	85.3	83.2	81.6	79.6	77.0	73.9	70.2	66.0	61.2	55.9
23	94.3	94.3	92.3	90.7	89.3	87.2	85.6	83.4	80.7	77.4	73.5	69.0	64.1	58.7
24	110.0	110.0	109.0	107.0	105.0	102.0	100.0	97.7	94.6	90.9	86.4	81.1	75.1	68.4
25	110.0	110.0	108.0	105.3	103.1	100.7	99.4	97.8	95.9	93.5	90.5	86.7	81.7	75.4
26	115.0	115.0	115.0	113.7	109.5	105.1	102.8	100.3	97.6	94.7	91.4	...	...	...
27	115.0	115.0	115.0	113.7	109.5	105.1	102.8	100.3	97.6	94.7	91.4	...	...	...
28	125.0	...	...	...	...	...	...	...	...	...	...	...	...	...
29	125.0	...	...	...	...	...	...	...	...	...	...	...	...	...
30	135.0	...	...	...	...	...	...	...	...	...	...	...	...	...
31	135.0	...	...	...	...	...	...	...	...	...	...	...	...	...
32	150.0	...	...	...	...	...	...	...	...	...	...	...	...	...
33	150.0	...	...	...	...	...	...	...	...	...	...	...	...	...
34	175.0	...	...	...	...	...	...	...	...	...	...	...	...	...
35	175.0	...	...	...	...	...	...	...	...	...	...	...	...	...
36	185.0	...	...	...	...	...	...	...	...	...	...	...	...	...
37	185.0	...	...	...	...	...	...	...	...	...	...	...	...	...
38	205.0	...	...	...	...	...	...	...	...	...	...	...	...	...
39	205.0	...	...	...	...	...	...	...	...	...	...	...	...	...
40	220.0	...	...	...	...	...	...	...	...	...	...	...	...	...
41	220.0	...	...	...	...	...	...	...	...	...	...	...	...	...
42	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
43	65.0	65.0	63.7	62.6	61.6	60.1	59.0	57.5	55.6	53.4	50.7	47.7	44.2	40.3
44	115.0	...	...	...	...	...	...	...	...	...	...	...	...	...
45	115.0	...	...	...	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1150	...	135
2	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1150	...	135
3	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1100	...	140
4	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1100	...	140
5	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1075	...	145
6	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1075	...	145
7	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1025	...	155
8	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1025	...	155
9	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H925	...	170
10	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H925	...	170
11	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H900	...	190
12	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H900	...	190
13	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1150	...	125
14	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1150	$t \geq \frac{1}{2}$	125
15	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1100	...	130
16	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1100	$t \geq \frac{1}{2}$	130
17	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1050	...	145
18	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1050	$t \geq \frac{1}{2}$	145
19	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1025	...	150
20	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1025	$t \geq \frac{1}{2}$	150
21	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1000	...	160
22	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1000	$t \geq \frac{1}{2}$	160
23	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H950	...	170
(23) 24	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H950	$t \geq \frac{1}{2}$	170
25	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H900	...	180
(23) 26	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H900	$t \geq \frac{1}{2}$	180
27	17Cr	Smls. & wld. tube	SA-268	TP430	S43000	...	...	60
28	17Cr	Plate	SA-240	430	S43000	...	...	65
29	17Cr	Bar	SA-479	430	S43000	...	...	70
30	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1150M	...	115
31	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1150M	...	115
32	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1150	...	135
33	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1150	...	135
34	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1150	...	135
35	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1100	...	140
36	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1100	...	140
37	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1100	...	140
38	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1075	...	145
39	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1075	...	145
40	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1075	...	145
41	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1025	...	155
42	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1025	...	155
43	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H925	...	170
44	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H900	...	190
45	17Cr-7Ni-1Al	Forgings	SA-705	631	S17700	TH1050	...	170

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	135.0	...	...	...	...	...	...	...	...	...	...	...	...	...
2	135.0	...	...	...	...	...	...	...	...	...	...	...	...	...
3	140.0	140.0	140.0	137.0	133.0	131.0	...	...	...	...	...	...	...	...
4	140.0	140.0	140.0	137.0	133.0	131.0	...	...	...	...	...	...	...	...
5	145.0	145.0	143.5	139.1	135.3	131.7	129.3	127.8	...	...	...	...	...	...
6	145.0	145.0	143.5	139.1	135.3	131.7	129.3	127.8	...	...	...	...	...	...
7	155.0	155.0	153.4	148.7	144.6	140.8	138.2	136.6	...	...	...	...	...	...
8	155.0	155.0	153.4	148.7	144.6	140.8	138.2	136.6	...	...	...	...	...	...
9	170.0	170.0	168.2	163.1	158.6	154.4	151.6	149.8	...	...	...	...	...	...
10	170.0	170.0	168.2	163.1	158.6	154.4	151.6	149.8	...	...	...	...	...	...
11	190.0	190.0	188.0	182.3	177.3	172.6	169.5	167.4	...	...	...	...	...	...
12	190.0	190.0	188.0	182.3	177.3	172.6	169.5	167.4	...	...	...	...	...	...
13	125.0	...	...	...	...	...	...	...	...	...	...	...	...	...
14	125.0	...	...	...	...	...	...	...	...	...	...	...	...	...
15	130.0	...	...	...	...	...	...	...	...	...	...	...	...	...
16	130.0	...	...	...	...	...	...	...	...	...	...	...	...	...
17	145.0	...	...	...	...	...	...	...	...	...	...	...	...	...
18	145.0	...	...	...	...	...	...	...	...	...	...	...	...	...
19	150.0	...	...	...	...	...	...	...	...	...	...	...	...	...
20	150.0	...	...	...	...	...	...	...	...	...	...	...	...	...
21	160.0	...	...	...	...	...	...	...	...	...	...	...	...	...
22	160.0	...	...	...	...	...	...	...	...	...	...	...	...	...
23	170.0	...	...	...	...	...	...	...	...	...	...	...	...	...
24	170.0	...	...	...	...	...	...	...	...	...	...	...	...	...
25	180.0	...	...	...	...	...	...	...	...	...	...	...	...	...
26	180.0	...	...	...	...	...	...	...	...	...	...	...	...	...
27	60.0	60.0	58.8	57.8	56.9	55.5	54.4	53.1	51.4	49.3	46.8	44.0	40.8	37.2
28	65.0	65.0	63.7	62.6	61.6	60.1	59.0	57.5	55.6	53.4	50.7	47.7	44.2	40.3
29	70.0	70.0	68.6	67.4	66.4	64.7	63.5	61.9	59.9	57.5	54.6	51.3	47.6	43.5
30	115.0	115.0	115.0	111.8	109.5	107.9	106.9	105.5	103.5	100.6	96.8	91.6	84.8	76.4
31	115.0	115.0	115.0	111.8	109.5	107.9	106.9	105.5	103.5	100.6	96.8	91.6	84.8	76.4
32	135.0	135.0	135.0	131.2	128.6	126.7	125.5	123.8	121.5	118.1	113.6	107.5	99.6	89.7
33	135.0	135.0	135.0	131.2	128.6	126.7	125.5	123.8	121.5	118.1	113.6	107.5	99.6	89.7
34	135.0	135.0	135.0	131.2	128.6	126.7	125.5	123.8	121.5	118.1	113.6	107.5	99.6	89.7
35	140.0	140.0	140.0	136.1	133.4	131.4	130.1	128.4	126.0	122.5	117.8	111.5	103.3	93.0
36	140.0	140.0	140.0	136.1	133.4	131.4	130.1	128.4	126.0	122.5	117.8	111.5	103.3	93.0
37	140.0	140.0	140.0	136.1	133.4	131.4	130.1	128.4	126.0	122.5	117.8	111.5	103.3	93.0
38	145.0	145.0	145.0	140.9	138.2	136.1	134.8	133.0	130.5	126.9	122.0	115.4	107.0	96.3
39	145.0	145.0	145.0	140.9	138.2	136.1	134.8	133.0	130.5	126.9	122.0	115.4	107.0	96.3
40	145.0	145.0	145.0	140.9	138.2	136.1	134.8	133.0	130.5	126.9	122.0	115.4	107.0	96.3
41	155.0	155.0	155.0	150.7	147.7	145.5	...	...	...	...	...	...	...	...
42	155.0	155.0	155.0	150.7	147.7	145.5	144.1	142.2	...	...	...	...	...	...
43	170.0	170.0	170.0	165.2	162.0	159.5	158.0	144.9	...	...	...	...	...	...
44	190.0	190.0	190.0	184.7	181.1	178.3	176.6	174.3	...	...	...	...	...	...
45	170.0	...	...	...	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
(23)	Ferrous Materials (Cont'd)							
	1 17Cr-7Ni-1Al	Forgings	SA-705	631	S17700	RH950	...	185
	2 18Cr-2Mo	Plate	SA-240	...	S44400	...	...	60
	3 18Cr-2Mo	Smls. & wld. tube	SA-268	...	S44400	...	...	60
	4 18Cr-Ti	Plate	SA-240	...	S43932	...	...	60
	5 18Cr-Ti	Smls. & wld. tube	SA-268	TP439	S43035	...	...	60
	6 18Cr-Ti	Wld. tube	SA-803	TP439	S43035	...	...	60
	7 18Cr-Ti	Smls. & wld. pipe	SA-731	TP439	S43035	...	...	60
	8 18Cr-Ti	Smls. & wld. tube	SA-268	TP430 Ti	S43036	...	...	60
	9 18Cr-Ti	Bar	SA-479	439	S43035	...	...	70
	10 26Cr-3Ni-3Mo	Plate	SA-240	26-3-3	S44660	...	$\leq \frac{2}{10}$	85
	11 26Cr-3Ni-3Mo	Smls. & wld. tube	SA-268	26-3-3	S44660	...	$\leq \frac{2}{10}$	85
	12 26Cr-3Ni-3Mo	Wld. tube	SA-803	26-3-3	S44660	...	$\leq \frac{2}{10}$	85
	13 27Cr	Smls. tube	SA-268	TP446-1	S44600	...	...	70
	14 27Cr-1Mo	Forgings	SA-182	FXM-27Cb	S44627	...	...	60
	15 27Cr-1Mo	Plate	SA-240	XM-27	S44627	...	...	65
	16 27Cr-1Mo	Smls. & wld. tube	SA-268	TPXM-27	S44627	...	...	65
	17 27Cr-1Mo	Bar	SA-479	XM-27	S44627	...	...	65
	18 27Cr-1Mo	Smls. & wld. pipe	SA-731	TPXM-27	S44627	...	...	65
	19 27Cr-1Mo-Ti	Smls. & wld. pipe	SA-731	TPXM-33	S44626	...	...	65
	20 27Cr-1Mo-Ti	Plate	SA-240	XM-33	S44626	...	...	68
	21 27Cr-1Mo-Ti	Smls. & wld. tube	SA-268	TPXM-33	S44626	...	...	68
	22 29Cr-4Mo	Bar	SA-479	...	S44700	...	...	70
	23 29Cr-4Mo	Plate	SA-240	...	S44700	...	...	80
	24 29Cr-4Mo	Smls. & wld. tube	SA-268	29-4	S44700	...	...	80
	25 29Cr-4Mo-2Ni	Bar	SA-479	...	S44800	...	...	70
	26 29Cr-4Mo-2Ni	Plate	SA-240	...	S44800	...	...	80
	27 29Cr-4Mo-2Ni	Smls. & wld. tube	SA-268	29-4-2	S44800	...	...	80
	28 29Cr-4Mo-Ti	Smls. & wld. tube	SA-268	...	S44735	...	...	75
	29 Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	...	...	105
	30 Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	A	...	85
	31 Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	B	...	90
	32 Mn- $\frac{1}{2}$ Mo	Plate	SA-302	A	K12021	...	...	75
	33 Mn- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	H75	K12021	...	...	75
	34 Mn- $\frac{1}{2}$ Mo	Plate	SA-302	B	K12022	...	...	80
	35 Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	1	...	80
	36 Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	2	...	90
	37 Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	3	...	100
	38 Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	1	...	80
	39 Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	2	...	90
	40 Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	3	...	100
	41 Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-302	C	K12039	...	...	80
	42 Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	1	...	80
	43 Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	H80	K12039	...	...	80
	44 Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J80	K12539	...	...	80
	45 Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	2	...	90

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	185.0	...	...	...	...	...	...	...	...	...	...	...	...	...
2	60.0	60.0	58.2	56.8	55.5	53.9	52.9	51.8	50.4	48.9	47.1	44.9	42.2	38.9
3	60.0	60.0	58.2	56.8	55.5	53.9	52.9	51.8	50.4	48.9	47.1	44.9	42.2	38.9
4	60.0	60.0	57.9	56.4	55.2	53.8	53.0	51.9	50.7	49.2	47.3	45.0	42.3	39.0
5	60.0	60.0	57.9	56.4	55.2	53.8	53.0	51.9	50.7	49.2	47.3	45.0	42.3	39.0
6	60.0	60.0	57.9	56.4	55.2	53.8	53.0	51.9	50.7	49.2	47.3	45.0	42.3	39.0
7	60.0	60.0	57.9	56.4	55.2	53.8	53.0	51.9	50.7	49.2	47.3	45.0	42.3	39.0
8	60.0	60.0	57.9	56.4	55.2	53.8	53.0	51.9	50.7	49.2	47.3	45.0	42.3	39.0
9	70.0	70.0	67.6	65.8	64.4	62.8	61.8	60.6	59.1	57.3	55.2	52.5	49.3	45.4
10	85.0	85.0	84.8	83.7	83.2	82.8	82.4	81.8	...	...	...	...	...	...
11	85.0	85.0	84.8	83.7	83.2	82.8	82.4	81.8	...	...	...	...	...	...
12	85.0	85.0	84.8	83.7	83.2	82.8	82.4	81.8	...	...	...	...	...	...
13	70.0	70.0	67.6	65.8	64.4	62.8	61.8	60.6	59.1	57.3	55.2	52.5	49.3	45.4
14	60.0	60.0	58.1	56.5	56.5	56.5	56.5	...	...	...	...	...	...	...
15	65.0	65.0	64.0	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
16	65.0	65.0	64.0	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
17	65.0	65.0	64.0	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
18	65.0	65.0	64.0	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
19	65.0	65.0	64.6	63.6	62.9	61.7	60.7	59.3	57.3	54.5	...	...	...	...
20	68.0	68.0	67.6	66.5	65.8	64.5	63.5	62.0	59.9	57.0	...	...	...	...
21	68.0	68.0	67.6	66.5	65.8	64.5	63.5	62.0	59.9	57.0	...	...	...	...
22	70.0	69.8	67.6	67.2	67.2	67.2	67.2	67.2	67.2	...	...	...	...	...
23	80.0	79.8	77.2	76.8	76.8	76.8	76.8	76.8	76.8	...	...	...	...	...
24	80.0	79.8	77.2	76.8	76.8	76.8	76.8	76.8	76.8	...	...	...	...	...
25	70.0	68.7	67.6	67.1	66.2	65.3	64.8	64.3	63.5	...	...	...	...	...
26	80.0	78.6	77.3	76.7	75.7	74.6	74.1	73.5	72.6	...	...	...	...	...
27	80.0	78.6	77.3	76.7	75.7	74.6	74.1	73.5	72.6	...	...	...	...	...
28	75.0	73.7	72.5	71.9	70.9	69.9	69.5	68.9	68.0	...	...	...	...	...
29	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	102.7	95.5	87.3	79.1	72.3	68.7
30	85.0	85.0	85.0	84.6	84.6	84.6	84.5	84.5	...	...	...	...	...	...
31	90.0	90.0	90.0	89.5	89.5	89.5	89.5	89.5	...	...	...	...	...	...
32	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	72.4	68.6	63.7	57.9
33	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	72.4	68.6	63.7	57.9
34	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
35	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
36	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
37	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.6	91.4	84.9	77.1
38	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
39	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
40	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.6	91.4	84.9	77.1
41	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
42	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
43	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
44	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
45	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
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29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
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38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
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41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J90	K12539	...	...	90
2	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	3	...	100
3	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J100	K12539	...	...	100
4	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-302	D	K12054	...	...	80
5	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	1	...	80
6	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	1	...	80
7	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	2	...	90
8	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	2	...	90
9	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	3	...	100
10	Mn- $\frac{1}{2}$ Ni-V	Plate	SA-225	C	K12524	...	...	105
11	Mn-V	Castings	SA-487	1	J13002	A	...	85
12	Mn-V	Castings	SA-487	1	J13002	B	...	90
13	$1\frac{1}{2}$ Si- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P15	K11578	...	...	60
14	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	A	...	90
15	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	B	...	105
16	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	E	...	115
17	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	1	...	80
18	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	2	...	90
19	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...	$2\frac{1}{2} < t \leq 4$	105
20	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Plate	SA-517	F	K11576	...	$\leq 2\frac{1}{2}$	115
21	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...	$\leq 2\frac{1}{2}$	115
22	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cu-Mo	Smls. & wld. tube	SA-423	2	K11540	...	...	60
23	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	1	...	80
24	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	1	...	80
25	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	2	...	90
26	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	2	...	90
27	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042	1	...	80
28	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042	2	...	90
29	$\frac{3}{4}$ Ni-1Mo- $\frac{3}{4}$ Cr	Castings	SA-217	WC5	J22000	...	...	70
30	1Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC4	J12082	...	...	70
31	$1\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650	...	$2\frac{1}{2} < t \leq 4$	105
32	$1\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650	...	$\leq 2\frac{1}{2}$	115
33	$1\frac{1}{2}$ Ni	Forgings	SA-350	LF5	K13050	1	...	60
34	$1\frac{1}{2}$ Ni	Forgings	SA-350	LF5	K13050	2	...	70
35	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Forgings	SA-372	L	K24055	...	...	155
36	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	4340	G43400	...	$\geq \frac{5}{8}$	170
37	$1\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	4340	G43400	...	$\leq \frac{1}{2}$	180
38	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	5	$6 < t \leq 9\frac{1}{2}$	115
39	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	5	≤ 6	120
40	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	4	$\leq 9\frac{1}{2}$	135
41	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	3	$\leq 9\frac{1}{2}$	145
42	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	2	$\leq 9\frac{1}{2}$	155
43	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	1	≤ 8	165
44	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	5	$6 < t \leq 9\frac{1}{2}$	115
45	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	5	≤ 6	120

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.6	91.4	84.9	77.1
3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.6	91.4	84.9	77.1
4	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
5	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
6	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
7	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
8	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.6	91.4	84.9	77.1
10	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	104.3	96.2	...	...	...	...
11	85.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	90.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	57.9	54.9	51.0	46.3
14	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	...	...	...	...	...	...
15	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	...	...	...	...	...	...
16	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	...	...	...	...	...	...
17	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
18	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	88.7	86.3	82.9	78.5	73.0	66.4
19	105.0	105.0	105.0	105.0	105.0	105.0	104.8	102.8	100.1	96.8	92.8	88.2	82.9	77.0
20	115.0	115.0	115.0	115.0	115.0	115.0	114.8	112.6	109.6	106.0	101.6	96.6	90.8	84.4
21	115.0	115.0	115.0	115.0	115.0	115.0	114.8	112.6	109.6	106.0	101.6	96.6	90.8	84.4
22	60.0	...	...	...	...	...	...	...	...	...	...	...	...	...
23	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
24	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
25	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
26	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
27	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	77.3	73.1	68.0	61.7
28	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	86.9	82.3	76.4	69.4
29	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	67.6	64.0	59.5	54.0
30	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	67.6	64.0	59.5	54.0
31	105.0	105.0	105.0	105.0	105.0	105.0	104.8	102.8	100.1	96.8	92.8	88.2	82.9	77.0
32	115.0	115.0	115.0	115.0	115.0	115.0	114.8	112.6	109.6	106.0	101.6	96.6	90.8	84.4
33	60.0	...	...	...	...	...	...	...	...	...	...	...	...	...
34	70.0	...	...	...	...	...	...	...	...	...	...	...	...	...
35	155.0	155.0	155.0	155.0	155.0	155.0	155.0	155.0	155.0	153.1	147.1	141.7	137.7	136.4
36	170.0	170.0	170.0	170.0	170.0	170.0	167.4	163.4	158.4	152.7	146.8	141.3	137.3	136.0
37	180.0	180.0	180.0	180.0	180.0	180.0	177.3	173.0	167.7	161.7	155.4	149.7	145.4	144.0
38	115.0	115.0	115.0	115.0	115.0	115.0	113.2	110.5	107.1	103.3	99.3	95.6	92.9	92.0
39	120.0	120.0	120.0	120.0	120.0	120.0	118.2	115.3	111.8	107.8	103.6	99.8	96.9	96.0
40	135.0	135.0	135.0	135.0	135.0	135.0	132.9	129.7	125.8	121.3	116.6	112.2	109.0	108.0
41	145.0	145.0	145.0	145.0	145.0	145.0	142.8	139.3	135.1	130.3	125.2	120.6	117.1	116.0
42	155.0	155.0	155.0	155.0	155.0	155.0	152.6	149.0	144.4	139.2	133.9	128.9	125.2	124.0
43	165.0	165.0	165.0	165.0	165.0	165.0	165.0	158.6	153.7	148.2	142.5	137.2	133.3	132.0
44	115.0	115.0	115.0	115.0	115.0	115.0	113.2	110.5	107.1	103.3	99.3	95.6	92.9	92.0
45	120.0	120.0	120.0	120.0	120.0	120.0	118.2	115.3	111.8	107.8	103.6	99.8	96.9	96.0

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	4	$\leq 9\frac{1}{2}$	135
2	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	3	$\leq 9\frac{1}{2}$	145
3	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	2	$\leq 9\frac{1}{2}$	155
4	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	1	≤ 8	165
5	2Ni-1Cu	Forgings	SA-182	FR	K22035	...	...	63
6	2Ni-1Cu	Fittings	SA-234	WPR	K22035	...	...	63
7	2Ni-1Cu	Smls. & wld. pipe	SA-333	9	K22035	...	...	63
8	2Ni-1Cu	Tube	SA-334	9	K22035	...	...	63
9	2Ni-1Cu	Forgings	SA-350	LF9	K22036	...	...	63
10	2Ni-1Cu	Smls. & wld. ftgs.	SA-420	WPL9	K22035	...	...	63
11	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	1	...	115
12	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	2	...	135
13	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	2a	...	145
14	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	3	...	155
15	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	4	...	175
16	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	5	...	190
17	2 $\frac{1}{2}$ Ni	Pipe	SA-333	7	K21903	...	...	65
18	2 $\frac{1}{2}$ Ni	Tube	SA-334	7	K21903	...	...	65
19	2 $\frac{1}{2}$ Ni	Plate	SA-203	A	K21703	...	...	65
20	2 $\frac{1}{2}$ Ni	Plate	SA-203	B	K22103	...	...	70
21	2 $\frac{1}{2}$ Ni	Castings	SA-352	LC2	J22500	...	...	70
22	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	...	3	...	90
23	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	...	1	...	105
24	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	...	2	...	115
25	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	1	...	115
26	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	2	...	135
27	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	2a	...	145
28	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	3	...	155
29	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	4	...	175
30	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	5	...	190
31	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	3	...	90
32	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	M	K42365	85	...	105
33	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	1	...	105
34	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	2	...	115
35	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	M	K42365	100	...	120
36	3 $\frac{1}{2}$ Ni	Pipe	SA-333	3	K31918	...	...	65
37	3 $\frac{1}{2}$ Ni	Tube	SA-334	3	K31918	...	...	65
38	3 $\frac{1}{2}$ Ni	Fittings	SA-420	WPL3	...	...	...	65
39	3 $\frac{1}{2}$ Ni	Plate	SA-203	D	K31718	...	...	65
40	3 $\frac{1}{2}$ Ni	Forgings	SA-350	LF3	K32025	...	...	70
41	3 $\frac{1}{2}$ Ni	Forgings	SA-765	III	K32026	...	...	70
42	3 $\frac{1}{2}$ Ni	Plate	SA-203	E	K32018	...	...	70
43	3 $\frac{1}{2}$ Ni	Castings	SA-352	LC3	J31550	...	...	70
44	3 $\frac{1}{2}$ Ni	Plate	SA-203	F	...	...	>2	75
45	3 $\frac{1}{2}$ Ni	Plate	SA-203	F	...	...	≤ 2	80

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	135.0	135.0	135.0	135.0	135.0	135.0	132.9	129.7	125.8	121.3	116.6	112.2	109.0	108.0
2	145.0	145.0	145.0	145.0	145.0	145.0	142.8	139.3	135.1	130.3	125.2	120.6	117.1	116.0
3	155.0	155.0	155.0	155.0	155.0	155.0	152.6	149.0	144.4	139.2	133.9	128.9	125.2	124.0
4	165.0	165.0	165.0	165.0	165.0	165.0	165.0	158.6	153.7	148.2	142.5	137.2	133.3	132.0
5	63.0	...	...	...	...	...	...	...	...	...	...	...	...	...
6	63.0	...	...	...	...	...	...	...	...	...	...	...	...	...
7	63.0	...	...	...	...	...	...	...	...	...	...	...	...	...
8	63.0	...	...	...	...	...	...	...	...	...	...	...	...	...
9	63.0	...	...	...	...	...	...	...	...	...	...	...	...	...
10	63.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	115.0	115.0	115.0	115.0	115.0	115.0	113.2	110.5	107.1	103.3	...	...	...	...
12	135.0	135.0	135.0	135.0	135.0	135.0	132.9	129.7	125.8	121.3	...	...	...	...
13	145.0	145.0	145.0	145.0	145.0	145.0	142.7	139.3	135.1	130.3	...	...	...	...
14	155.0	155.0	155.0	155.0	155.0	155.0	152.6	149.0	144.4	139.2	...	...	...	...
15	175.0	175.0	175.0	175.0	175.0	175.0	172.3	168.2	163.1	157.2	...	...	...	...
16	190.0	190.0	190.0	190.0	190.0	190.0	187.1	182.6	177.0	170.7	...	...	...	...
17	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
18	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
19	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
20	70.0	70.0	70.0	70.0	70.0	70.0	70.0	66.5	62.0	57.9	54.0	50.1	45.5	39.1
21	70.0	70.0	70.0	70.0	70.0	70.0	70.0	66.5	62.0	57.9	54.0	50.1	45.5	39.1
22	90.0	90.0	90.0	89.1	88.5	87.3	86.2	84.7	82.6	79.9	76.5	72.5	67.7	62.1
23	105.0	105.0	105.0	103.9	103.3	101.9	100.6	98.8	96.4	93.2	89.3	84.5	78.9	72.5
24	115.0	115.0	115.0	113.8	113.1	111.6	110.2	108.2	105.5	102.1	97.8	92.6	86.5	79.4
25	115.0	115.0	115.0	115.0	115.0	115.0	113.2	110.5	107.1	103.3	...	...	...	...
26	135.0	135.0	135.0	135.0	135.0	135.0	132.9	129.7	125.8	121.3	...	...	...	...
27	145.0	145.0	145.0	145.0	145.0	145.0	142.7	139.3	135.1	130.3	...	...	...	...
28	155.0	155.0	155.0	155.0	155.0	155.0	152.6	149.0	144.4	139.2	...	...	...	...
29	175.0	175.0	175.0	175.0	175.0	175.0	172.3	168.2	163.1	157.2	...	...	...	...
30	190.0	190.0	190.0	190.0	190.0	190.0	187.1	182.6	177.0	170.7	...	...	...	...
31	90.0	90.0	90.0	89.1	88.5	87.3	86.2	84.7	82.6	79.9	76.5	72.5	67.7	62.1
32	105.0	105.0	105.0	103.9	103.3	101.9	100.6	98.8	96.4	93.2	89.3	84.5	78.9	72.5
33	105.0	105.0	105.0	103.9	103.3	101.9	100.6	98.8	96.4	93.2	89.3	84.5	78.9	72.5
34	115.0	115.0	115.0	113.8	113.1	111.6	110.2	108.2	105.5	102.1	97.8	92.6	86.5	79.4
35	120.0	120.0	120.0	118.8	118.0	116.4	115.0	112.9	110.1	106.5	102.0	96.6	90.2	82.8
36	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
37	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
38	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
39	65.0	65.0	65.0	65.0	65.0	65.0	65.0	61.7	57.6	53.7	50.1	46.5	42.2	36.3
40	70.0	70.0	70.0	70.0	70.0	70.0	70.0	66.5	62.0	57.9	54.0	50.1	45.5	39.1
41	70.0	70.0	70.0	70.0	70.0	70.0	70.0	66.5	62.0	57.9	54.0	50.1	45.5	39.1
42	70.0	70.0	70.0	70.0	70.0	70.0	70.0	66.5	62.0	57.9	54.0	50.1	45.5	39.1
43	70.0	70.0	70.0	70.0	70.0	70.0	70.0	66.5	62.0	57.9	54.0	50.1	45.5	39.1
44	75.0	75.0	75.0	75.0	75.0	75.0	75.0	71.2	66.5	62.0	57.9	53.7	48.7	41.9
45	80.0	80.0	80.0	80.0	80.0	80.0	80.0	76.0	70.9	66.1	61.7	57.2	52.0	44.7

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375	3	...	90
2	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375	1	...	105
3	3½Ni-1¾Cr-½Mo-V	Forgings	SA-508	4N	K22375	2	...	115
4	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	1	...	115
5	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	2	...	135
6	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	3	...	155
7	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	2a	...	145
8	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	4	...	175
9	4Ni-1½Cr-½Mo-V	Forgings	SA-723	3	K44045	5	...	190
10	5Ni-¼Mo	Plate	SA-645	A	K41583	...	...	95
11	7Ni	Plate	SA-553	III	K61365	...	≤2	100
12	8Ni	Forgings	SA-522	II	K71340	...	...	100
13	8Ni	Plate	SA-553	II	K71340	...	...	100
14	9Ni	Plate	SA/EN 10028-4	X8Ni9	...	NNT640	≤2	93
15	9Ni	Plate	SA/EN 10028-4	X8Ni9	...	QT640	≤2	93
16	9Ni	Plate	SA/EN 10028-4	X7Ni9	...	QT	≤2	98.5
17	9Ni	Plate	SA/EN 10028-4	X8Ni9	...	QT680	≤2	98.5
18	9Ni	Smls. & wld. pipe	SA-333	8	K81340	...	...	100
19	9Ni	Smls. & wld. tube	SA-334	8	K81340	...	...	100
20	9Ni	Plate	SA-353	...	K81340	...	...	100
21	9Ni	Smls. & wld. ftgs.	SA-420	WPL8	K81340	...	...	100
22	9Ni	Forgings	SA-522	I	K81340	...	...	100
23	9Ni	Plate	SA-553	I	K81340	...	...	100
24	25Ni-15Cr-2Ti	Bolting	SA-453	660	S66286	A	...	130
25	25Ni-15Cr-2Ti	Bolting	SA-453	660	S66286	B	...	130
26	25Ni-15Cr-2Ti	Forgings, bar	SA-638	660	S66286	1	...	130
27	25Ni-15Cr-2Ti	Forgings, bar	SA-638	660	S66286	2	...	130
28	27Ni-22Cr-7Mo-Mn-Cu-N	Forgings	SA-182	...	S31277	...	...	112
29	27Ni-22Cr-7Mo-Mn-Cu-N	Smls. tube	SA-213	...	S31277	...	...	112
30	27Ni-22Cr-7Mo-Mn-Cu-N	Plate	SA-240	...	S31277	...	...	112
31	27Ni-22Cr-7Mo-Mn-Cu-N	Wld. tube	SA-249	...	S31277	...	...	112
32	29Ni-20Cr-3Cu-2Mo	Castings	SA-351	CN7M	J95150	...	...	62
33	14Cr-16Ni-6Si-Cu-Mo	Smls. tube	SA-213	...	S38815	...	...	78
34	14Cr-16Ni-6Si-Cu-Mo	Plate	SA-240	...	S38815	...	...	78
35	14Cr-16Ni-6Si-Cu-Mo	Wld. tube	SA-249	...	S38815	...	...	78
36	14Cr-16Ni-6Si-Cu-Mo	Wld. pipe	SA-312	...	S38815	...	...	78
37	14Cr-16Ni-6Si-Cu-Mo	Smls. & wld. fittings	SA-403	...	S38815	...	...	78
38	14Cr-16Ni-6Si-Cu-Mo	Bar	SA-479	...	S38815	...	...	78
39	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...	...	95
40	16Cr-9Mn-2Ni-N	Plate	SA-240	204	S20400	...	...	95
41	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	>5	65
42	16Cr-12Ni-2Mo	Forgings	SA-965	F316L	S31603	...	...	65
43	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...	≤5	70
44	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...	...	70
45	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...	...	70

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	90.0	90.0	90.0	89.1	88.5	87.3	86.2	84.7	82.6	79.9	76.5	72.5	67.7	62.1
2	105.0	105.0	105.0	103.9	103.3	101.9	100.6	98.8	96.4	93.2	89.3	84.5	78.9	72.5
3	115.0	115.0	115.0	113.8	113.1	111.6	110.2	108.2	105.5	102.1	97.8	92.6	86.5	79.4
4	115.0	115.0	115.0	115.0	115.0	115.0	113.2	110.5	107.1	103.3	...	...	...	...
5	135.0	135.0	135.0	135.0	135.0	135.0	132.9	129.7	125.8	121.3	...	...	...	...
6	155.0	155.0	155.0	155.0	155.0	155.0	152.6	149.0	144.4	139.2	...	...	...	...
7	145.0	145.0	145.0	145.0	145.0	145.0	142.7	139.3	135.1	130.3	...	...	...	...
8	175.0	175.0	175.0	175.0	175.0	175.0	172.3	168.2	163.1	157.2	...	...	...	...
9	190.0	190.0	190.0	190.0	190.0	190.0	187.1	182.6	177.0	170.7	...	...	...	...
10	95.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	100.0	90.2	...	...	...	...	...	...	...	...	...	...	...	...
12	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
13	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
14	92.8	92.8	92.4	...	...	...	...	...	...	...	...	...	...	...
15	92.8	92.8	92.4	...	...	...	...	...	...	...	...	...	...	...
16	98.6	98.6	98.2	...	...	...	...	...	...	...	...	...	...	...
17	98.6	98.6	98.2	...	...	...	...	...	...	...	...	...	...	...
18	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
19	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
20	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
21	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
22	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
23	100.0	100.0	99.5	...	...	...	...	...	...	...	...	...	...	...
24	130.0	130.0	130.0	129.7	127.1	124.8	123.7	122.6	121.3	119.8	118.3	116.4	114.4	112.1
25	130.0	130.0	130.0	129.7	127.1	124.8	123.7	122.6	121.3	119.8	118.3	116.4	114.4	112.1
26	130.0	130.0	130.0	130.0	127.6	125.2	124.0	122.7	121.3	119.8	118.1	116.3	114.4	112.1
27	130.0	130.0	130.0	130.0	127.6	125.2	124.0	122.7	121.3	119.8	118.1	116.3	114.4	112.1
28	112.0	103.3	97.6	93.4	90.3	87.6	86.3	85.2	84.2	83.6	...	...	...	...
29	112.0	103.3	97.6	93.4	90.3	87.6	86.3	85.2	84.2	83.6	...	...	...	...
30	112.0	103.3	97.6	93.4	90.3	87.6	86.3	85.2	84.2	83.6	...	...	...	...
31	112.0	103.3	97.6	93.4	90.3	87.6	86.3	85.2	84.2	83.6	...	...	...	...
32	62.0	52.4	47.7	44.6	42.4	40.6	39.9	39.2	...	...	...	...	...	...
33	78.0	78.0	77.8	75.3	73.5	72.4	72.2	72.1	72.0	71.9	...	...	...	...
34	78.0	78.0	77.8	75.3	73.5	72.4	72.2	72.1	72.0	71.9	...	...	...	...
35	78.0	78.0	77.8	75.3	73.5	72.4	72.2	72.1	72.0	71.9	...	...	...	...
36	78.0	78.0	77.8	75.3	73.5	72.4	72.2	72.1	72.0	71.9	...	...	...	...
37	78.0	78.0	77.8	75.3	73.5	72.4	72.2	72.1	72.0	71.9	...	...	...	...
38	78.0	78.0	77.8	75.3	73.5	72.4	72.2	72.1	72.0	71.9	...	...	...	...
39	95.0	82.9	74.2	70.3	69.1	68.7	68.4	67.9	67.0	65.9	64.5	63.0	61.7	60.9
40	95.0	82.6	72.2	66.2	63.5	62.7	62.6	62.6	62.3	61.8	60.8	59.2	56.8	53.4
41	65.0	63.2	59.5	57.8	57.3	57.3	57.2	57.1	56.7	56.2	55.4	54.4	53.0	51.4
42	65.0	63.2	59.5	57.8	57.3	57.3	57.2	57.1	56.7	56.2	55.4	54.4	53.0	51.4
43	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
44	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
45	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	50.1	48.6	46.7	44.6	...	...	...	...	...	...	...	...	...
42	50.1	48.6	46.7	44.6	...	...	...	...	...	...	...	...	...
43	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
44	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
45	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...	...	70
2	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316L	S31603	...	...	70
3	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	1	...	70
4	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	3	...	70
5	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	4	...	70
6	16Cr-12Ni-2Mo	Smls. & wld. ftgs.	SA-403	316L	S31603	...	...	70
7	16Cr-12Ni-2Mo	Wld. pipe	SA-409	TP316L	S31603	...	...	70
8	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	Annealed	...	70
9	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316L	S31603	...	...	70
10	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316L	S31603	...	...	70
11	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316L	S31603	...	...	70
12	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316L	...	...	...	70
13	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	>5	70
14	16Cr-12Ni-2Mo	Forgings	SA-965	F316	S31600	...	...	70
15	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	>5	70
16	16Cr-12Ni-2Mo	Forgings	SA-965	F316H	S31609	...	...	70
17	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...	≤5	75
18	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	1	...	75
19	16Cr-12Ni-2Mo	Bolting	SA-193	B8MA	S31600	1A	...	75
20	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...	...	75
21	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...	...	75
22	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...	...	75
23	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...	...	75
24	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	1	...	75
25	16Cr-12Ni-2Mo	Bolting	SA-320	B8MA	S31600	1A	...	75
26	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	1	...	75
27	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	3	...	75
28	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	4	...	75
29	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316	S31600	...	...	75
30	16Cr-12Ni-2Mo	Smls. & wld. ftgs.	SA-403	316	S31600	...	...	75
31	16Cr-12Ni-2Mo	Wld. pipe	SA-409	TP316	S31600	...	...	75
32	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	Annealed	...	75
33	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...	...	75
34	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316	S31600	...	...	75
35	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316	S31600	...	...	75
36	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316	...	...	...	75
37	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X2CrNiMo17-12-2	...	...	≤3	75
38	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X5CrNiMo17-12-2	...	...	≤3	75
39	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...	≤5	75
40	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316H	S31609	...	...	75
41	16Cr-12Ni-2Mo	Plate	SA-240	316H	S31609	...	...	75
42	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...	...	75
43	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316H	S31609	...	...	75
44	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	1	...	75
45	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	3	...	75

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
2	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
3	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
4	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
5	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
6	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
7	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
8	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
9	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
10	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
11	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
12	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
13	70.0	70.0	68.0	67.1	67.0	67.0	67.0	67.0	66.7	66.1	65.1	63.8	62.1	60.0
14	70.0	70.0	68.0	67.1	67.0	67.0	67.0	67.0	66.7	66.1	65.1	63.8	62.1	60.0
15	70.0	70.0	68.0	67.1	67.0	67.0	67.0	67.0	66.7	66.1	65.1	63.8	62.1	60.0
16	70.0	70.0	68.0	67.1	67.0	67.0	67.0	67.0	66.7	66.1	65.1	63.8	62.1	60.0
17	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
18	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
19	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
20	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
21	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
22	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
23	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
24	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
25	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
26	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
27	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
28	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
29	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
30	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
31	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
32	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
33	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
34	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
35	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
36	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
37	75.4	72.9	69.5	67.1	66.2	66.2	66.2	66.2	66.0	65.3	64.3	62.9	61.4	59.8
38	75.4	75.1	73.5	72.4	72.0	72.0	72.0	72.0	71.9	71.2	70.1	68.7	66.8	64.7
39	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
40	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
41	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
42	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
43	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
44	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
45	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
2	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
3	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
4	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
5	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
6	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
7	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
8	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
9	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
10	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
11	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	56.3	52.2	48.3	44.5	40.9	37.4	34.0	30.8	27.8	24.9	...	...	...
14	56.3	52.2	48.3	44.5	40.9	37.4	34.0	30.8	27.8	24.9	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
18	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
19	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
20	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
21	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
22	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
23	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
24	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
25	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
26	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
27	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
28	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
29	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
30	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
31	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
32	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
33	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
34	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
35	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	4	...	75
2	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316H	S31609	...	...	75
3	16Cr-12Ni-2Mo	Smls. & wld. ftgs.	SA-403	316H	S31609	...	...	75
4	16Cr-12Ni-2Mo	Bar	SA-479	316H	S31609	...	...	75
5	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316H	S31609	...	...	75
6	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316H	S31609	...	...	75
7	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	S	$2\frac{1}{2} < t \leq 3$	80
(23) 8	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B	$2\frac{1}{2} < t \leq 3$	80
9	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	90
10	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	90
(23) 11	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B	$2 < t \leq 2\frac{1}{2}$	90
12	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	S	$2 < t \leq 2\frac{1}{2}$	90
13	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B	$1\frac{1}{2} < t \leq 1\frac{3}{4}$	95
14	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$1 < t \leq 1\frac{1}{4}$	95
15	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$1 < t \leq 1\frac{1}{4}$	95
(23) 16	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B	≤ 2	95
17	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	S	$t \leq 2$	95
18	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100
19	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$\frac{3}{4} < t \leq 1$	100
20	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$\frac{3}{4} < t \leq 1$	100
21	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B	$1 < t \leq 1\frac{1}{4}$	105
22	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2	$\leq \frac{3}{4}$	110
23	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2	$\leq \frac{3}{4}$	110
24	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B	$\frac{3}{4} < t \leq 1$	115
25	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B	$t \leq \frac{1}{4}$	125
26	16Cr-12Ni-2Mo-Cb	Plate	SA-240	316Cb	S31640	...	...	75
27	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...	> 5	70
28	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316LN	S31653	...	...	70
29	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...	≤ 5	75
30	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316LN	S31653	...	...	75
31	16Cr-12Ni-2Mo-N	Plate	SA-240	316LN	S31653	...	...	75
32	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316LN	S31653	...	...	75
33	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316LN	S31653	...	...	75
34	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	1	...	75
35	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	3	...	75
36	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	4	...	75
37	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316LN	S31653	...	...	75
38	16Cr-12Ni-2Mo-N	Fittings	SA-403	316LN	S31653	...	...	75
39	16Cr-12Ni-2Mo-N	Bar	SA-479	316LN	S31653	...	...	75
40	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316LN	S31653	...	...	75
41	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316N	S31651	...	...	80
42	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316N	S31651	...	...	80
43	16Cr-12Ni-2Mo-N	Plate	SA-240	316N	S31651	...	...	80
44	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651	...	...	80
45	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316N	S31651	...	...	80

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
2	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
3	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
4	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
5	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
6	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
7	80.0	80.0	77.8	76.7	76.6	76.6	...	...	...	...	...	...	...	...
8	80.0	80.0	77.2	74.4	74.4	74.4	74.4	74.4	73.9	73.5	72.2	70.4	68.6	66.9
9	90.0	90.0	86.8	83.7	83.7	83.7	83.7	83.7	83.2	82.7	81.2	79.2	77.2	75.2
10	90.0	90.0	86.8	83.7	83.7	83.7	83.7	83.7	83.2	82.7	81.2	79.2	77.2	75.2
11	90.0	90.0	86.8	83.7	83.7	83.7	83.7	83.7	83.2	82.7	81.2	79.2	77.2	75.2
12	90.0	90.0	87.5	86.3	86.2	86.2	...	...	...	...	...	...	...	...
13	95.0	95.0	92.3	91.1	90.9	90.9	...	...	...	...	...	...	...	...
14	95.0	95.0	91.6	88.3	88.3	88.3	88.3	88.3	87.8	87.3	85.7	83.6	81.5	79.4
15	95.0	95.0	91.6	88.3	88.3	88.3	88.3	88.3	87.8	87.3	85.7	83.6	81.5	79.4
16	95.0	95.0	91.6	88.3	88.3	88.3	88.3	88.3	87.8	87.3	85.7	83.6	81.5	79.4
17	95.0	95.0	92.3	91.1	90.9	90.9	...	...	...	...	...	...	...	...
18	100.0	100.0	97.2	95.9	95.7	95.7	...	...	...	...	...	...	...	...
19	100.0	100.0	98.6	96.3	95.7	95.7	95.7	95.7	95.3	94.4	93.0	91.1	88.7	85.7
20	100.0	100.0	98.6	96.3	95.7	95.7	95.7	95.7	95.3	94.4	93.0	91.1	88.7	85.7
21	105.0	105.0	102.1	100.7	100.5	100.5	...	...	...	...	...	...	...	...
22	110.0	110.0	108.4	105.9	105.3	105.3	105.3	105.3	104.8	103.8	102.3	100.2	97.6	94.3
23	110.0	110.0	108.4	105.9	105.3	105.3	105.3	105.3	104.8	103.8	102.3	100.2	97.6	94.3
24	115.0	115.0	111.8	110.2	110.1	110.1	...	...	...	...	...	...	...	...
25	125.0	125.0	121.5	119.8	119.7	119.7	...	...	...	...	...	...	...	...
26	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	...	...	...
27	70.0	70.0	66.0	62.6	60.3	59.0	58.6	58.3	57.9	57.6	57.1	56.4	55.6	54.6
28	70.0	70.0	66.0	62.6	60.3	59.0	58.6	58.3	57.9	57.6	57.1	56.4	55.6	54.6
29	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
30	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
31	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
32	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
33	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
34	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
35	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
36	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
37	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
38	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
39	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
40	75.0	75.0	70.7	67.1	64.6	63.3	62.8	62.4	62.1	61.7	61.1	60.4	59.6	58.4
41	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
42	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
43	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
44	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
45	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	(23)
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	(23)
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	(23)
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	1	...	80
2	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	3	...	80
3	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	4	...	80
4	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316N	S31651	...	...	80
5	16Cr-12Ni-2Mo-N	Smls. & wld. ftgs.	SA-403	316N	S31651	...	...	80
6	16Cr-12Ni-2Mo-N	Bar	SA-479	316N	S31651	...	...	80
7	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316N	S31651	...	...	80
8	16Cr-12Ni-2Mo-N	Wld. pipe	SA-813	TP316N	S31651	...	...	80
9	16Cr-12Ni-2Mo-N	Wld. pipe	SA-814	TP316N	S31651	...	...	80
10	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316N	S31651	...	...	80
11	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-11-2	...	...	≤3	84
12	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-13-3	...	...	≤3	84
(23) 13	16Cr-12Ni-2Mo-Ti	Smls. tube	SA-213	TP316Ti	S31635	...	...	75
(23) 14	16Cr-12Ni-2Mo-Ti	Plate	SA-240	316Ti	S31635	...	...	75
(23) 15	16Cr-12Ni-2Mo-Ti	Smls. & wld. pipe	SA-312	TP316Ti	S31635	...	...	75
16	17Cr-4Ni-6Mn	Plate	SA-240	201-1	S20100	...	...	75
17	17Cr-4Ni-6Mn	Plate	SA-666	201-1	S20100	...	...	75
18	17Cr-4Ni-6Mn	Plate	SA-240	201-2	S20100	...	...	95
19	17Cr-4Ni-6Mn	Plate	SA-666	201-2	S20100	...	...	95
20	17Cr-7Ni	Plate, sheet, strip	SA-240	301	S30100	...	...	75
21	17.5Cr-17.5Ni-5.3Si	Plate	SA-240	...	S30601	Solution ann.	...	78
22	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000	...	...	100
23	18Cr-3Ni-12Mn	Wld. tube	SA-249	XM-29	S24000	...	...	100
24	18Cr-3Ni-12Mn	Wld. pipe	SA-312	XM-29	S24000	...	...	100
25	18Cr-3Ni-12Mn	Bar	SA-479	XM-29	S24000	...	...	100
26	18Cr-3Ni-12Mn	Wld. tube	SA-688	TPXM-29	S24000	...	...	100
27	18Cr-5Ni-3Mo	Smls. & wld. tube	SA-789	...	S31500	...	...	92
28	18Cr-5Ni-3Mo	Smls. & wld. pipe	SA-790	...	S31500	...	...	92
29	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	>5	65
30	18Cr-8Ni	Forgings	SA-965	F304L	S30403	...	...	65
31	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...	≤5	70
32	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...	...	70
33	18Cr-8Ni	Plate	SA-240	304L	S30403	...	...	70
34	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...	...	70
35	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304L	S30403	...	...	70
36	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	1	...	70
37	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	3	...	70
38	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	4	...	70
39	18Cr-8Ni	Smls. & wld. ftgs.	SA-403	304L	S30403	...	...	70
40	18Cr-8Ni	Wld. pipe	SA-409	TP304L	S30403	...	...	70
41	18Cr-8Ni	Bar	SA-479	304L	S30403	Annealed	...	70
42	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...	...	70
43	18Cr-8Ni	Wld. pipe	SA-813	TP304L	S30403	...	...	70
44	18Cr-8Ni	Wld. pipe	SA-814	TP304L	S30403	...	...	70
45	18Cr-8Ni	Bar	SA/JIS G4303	SUS304L	...	...	...	70

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
2	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
3	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
4	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
5	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
6	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
7	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
8	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
9	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
10	80.0	80.0	77.0	75.1	74.4	74.3	74.3	74.3	74.2	73.9	73.3	72.4	71.1	69.3
11	84.1	83.5	79.5	75.4	72.5	70.9	70.4	70.0	69.7	69.2	68.6	67.8	66.7	65.6
12	84.1	83.5	79.5	75.4	72.5	70.9	70.4	70.0	69.7	69.2	68.6	67.8	66.7	65.6
13	75.0	69.8	63.7	60.3	58.8	58.5	58.5	58.5	58.5	58.5	58.5	58.3	57.6	56.6
14	75.0	69.8	63.7	60.3	58.8	58.5	58.5	58.5	58.5	58.5	58.5	58.3	57.6	56.6
15	75.0	69.8	63.7	60.3	58.8	58.5	58.5	58.5	58.5	58.5	58.5	58.3	57.6	56.6
16	75.0	65.6	60.3	58.4	...	...	...	...	...	...	...	...	...	...
17	75.0	65.6	60.3	58.4	...	...	...	...	...	...	...	...	...	...
18	95.0	83.1	76.4	74.0	...	...	...	...	...	...	...	...	...	...
19	95.0	83.1	76.4	74.0	...	...	...	...	...	...	...	...	...	...
20	75.0	61.1	55.1	53.9	53.9	53.9	53.9	53.7	52.5	51.2	49.9	49.2	...	...
21	78.0	78.0	74.0	70.0	66.0	...	...	...	...	...	...	...	...	...
22	100.0	97.7	91.1	87.3	85.1	83.3	82.0	80.5	78.5	76.3	73.8	71.4	69.4	68.3
23	100.0	97.7	91.1	87.3	85.1	83.3	82.0	80.5	78.5	76.3	73.8	71.4	69.4	68.3
24	100.0	97.7	91.1	87.3	85.1	83.3	82.0	80.5	78.5	76.3	73.8	71.4	69.4	68.3
25	100.0	97.7	91.1	87.3	85.1	83.3	82.0	80.5	78.5	76.3	73.8	71.4	69.4	68.3
26	100.0	97.7	91.1	87.3	85.1	83.3	82.0	80.5	78.5	76.3	73.8	71.4	69.4	68.3
27	92.0	88.8	85.4	84.8	84.8	84.8	84.8	84.8	84.8	...	...	...	...	...
28	92.0	88.8	85.4	84.8	84.8	84.8	84.8	84.8	84.8	...	...	...	...	...
29	65.0	61.3	56.9	54.5	53.4	52.9	52.6	52.4	52.0	51.4	50.7	49.8	48.6	47.1
30	65.0	61.3	56.9	54.5	53.4	52.9	52.6	52.4	52.0	51.4	50.7	49.8	48.6	47.1
31	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
32	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
33	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
34	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
35	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
36	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
37	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
38	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
39	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
40	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
41	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
42	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
43	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
44	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7
45	70.0	66.1	61.2	58.7	57.5	56.9	56.7	56.4	56.0	55.4	54.6	53.6	52.3	50.7

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	55.3	53.6	51.4	48.9	46.1	42.8	39.3	35.6	31.8	27.9	...	...	...
14	55.3	53.6	51.4	48.9	46.1	42.8	39.3	35.6	31.8	27.9	...	...	...
15	55.3	53.6	51.4	48.9	46.1	42.8	39.3	35.6	31.8	27.9	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	46.6	45.6	44.7	43.7	...	...	...	...	...	...	...	...	...
30	46.6	45.6	44.7	43.7	...	...	...	...	...	...	...	...	...
31	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
32	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
33	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
34	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
35	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
36	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
37	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
38	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
39	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
40	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
41	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
42	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
43	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
44	50.2	49.1	48.1	47.0	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
(23)	1 18Cr-8Ni	Forgings	SA-182	F304	S30400	...	>5	70
	2 18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	>5	70
	3 18Cr-8Ni	Castings	SA-351	CF3	J92500	...	...	70
	4 18Cr-8Ni	Castings	SA-351	CF8	J92600	...	...	70
	5 18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	≥8	70
	6 18Cr-8Ni	Cast pipe	SA-451	CPF3	J92500	...	...	70
	7 18Cr-8Ni	Cast pipe	SA-451	CPF8	J92600	...	...	70
	8 18Cr-8Ni	Forgings	SA-965	F304	S30400	...	...	70
	9 18Cr-8Ni	Forgings	SA-965	F304H	S30409	...	...	70
	10 18Cr-8Ni	Plate	SA/EN 10028-7	X2CrNi18-9	...	...	≤3	72.5
	11 18Cr-8Ni	Forgings	SA-182	F304	S30400	...	≤5	75
	12 18Cr-8Ni	Forgings	SA-182	F304H	S30409	...	≤5	75
	13 18Cr-8Ni	Bolting	SA-193	B8	S30400	1	...	75
	14 18Cr-8Ni	Bolting	SA-193	B8A	S30400	1A	...	75
	15 18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...	...	75
	16 18Cr-8Ni	Smls. tube	SA-213	TP304H	S30409	...	...	75
	17 18Cr-8Ni	Plate	SA-240	302	S30200	...	...	75
	18 18Cr-8Ni	Plate	SA-240	304	S30400	...	...	75
	19 18Cr-8Ni	Plate	SA-240	304H	S30409	...	...	75
	20 18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...	...	75
	21 18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...	...	75
	22 18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304	S30400	...	...	75
	23 18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304H	S30409	...	...	75
	24 18Cr-8Ni	Bolting	SA-320	B8	S30400	1	...	75
	25 18Cr-8Ni	Bolting	SA-320	B8A	S30400	1A	...	75
	26 18Cr-8Ni	Wld. pipe	SA-358	304	S30400	1	...	75
	27 18Cr-8Ni	Wld. pipe	SA-358	304	S30400	3	...	75
	28 18Cr-8Ni	Wld. pipe	SA-358	304	S30400	4	...	75
	29 18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	1	...	75
	30 18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	3	...	75
(23)	31 18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	4	...	75
	32 18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	1	...	75
	33 18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	3	...	75
	34 18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	4	...	75
	35 18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...	<8	75
	36 18Cr-8Ni	Smls. pipe	SA-376	TP304H	S30409	...	...	75
	37 18Cr-8Ni	Smls. & wld. ftgs.	SA-403	304	S30400	...	...	75
	38 18Cr-8Ni	Smls. & wld. ftgs.	SA-403	304H	S30409	...	...	75
	39 18Cr-8Ni	Wld. pipe	SA-409	TP304	S30400	...	...	75
	40 18Cr-8Ni	Bar	SA-479	302	S30200	...	...	75
	41 18Cr-8Ni	Bar	SA-479	304	S30400	Annealed	...	75
	42 18Cr-8Ni	Bar	SA-479	304H	S30409	...	...	75
	43 18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...	...	75
	44 18Cr-8Ni	Wld. pipe	SA-813	TP304	S30400	...	...	75
	45 18Cr-8Ni	Wld. pipe	SA-813	TP304H	S30409	...	...	75

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
2	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
3	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
4	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
5	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
6	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
7	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
8	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
9	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
10	72.5	68.1	63.9	60.8	59.3	58.8	58.7	58.5	58.1	57.5	56.6	55.4	54.0	52.7
11	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
12	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
13	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
14	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
15	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
16	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
17	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
18	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
19	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
20	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
21	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
22	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
23	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
24	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
25	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
26	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
27	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
28	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
29	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
30	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
31	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
32	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
33	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
34	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
35	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
36	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
37	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
38	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
39	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
40	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
41	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
42	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
43	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
44	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
45	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	52.4	50.1	47.4	44.2	40.6	36.7	32.7	28.8	25.3	22.4	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	52.4	50.1	47.4	44.2	40.6	36.7	32.7	28.8	25.3	22.4	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	52.4	50.1	47.4	44.2	40.6	36.7	32.7	28.8	25.3	22.4	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
14	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
15	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
25	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
26	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
27	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
28	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
44	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	18Cr-8Ni	Wld. pipe	SA-814	TP304	S30400	...	...	75
2	18Cr-8Ni	Wld. pipe	SA-814	TP304H	S30409	...	...	75
3	18Cr-8Ni	Bar	SA/JIS G4303	SUS302	...	...	...	75
4	18Cr-8Ni	Bar	SA/JIS G4303	SUS304	...	...	...	75
5	18Cr-8Ni	Plate	SA/EN 10028-7	X5CrNi18-10	...	...	≤3	75
6	18Cr-8Ni	Castings	SA-351	CF3A	J92500	...	...	77
7	18Cr-8Ni	Castings	SA-351	CF8A	J92600	...	...	77
8	18Cr-8Ni	Cast pipe	SA-451	CPF3A	J92500	...	...	77
9	18Cr-8Ni	Cast pipe	SA-451	CPF8A	J92600	...	...	77
10	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100
11	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$1 < t \leq 1\frac{1}{4}$	105
12	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$\frac{3}{4} < t \leq 1$	115
13	18Cr-8Ni	Bolting	SA-320	B8	S30400	2	$t \leq \frac{3}{4}$	125
14	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...	>5	70
15	18Cr-8Ni-N	Forgings	SA-965	F304LN	S30453	...	...	70
16	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...	≤5	75
17	18Cr-8Ni-N	Bolting	SA-193	B8NA	S30451	1A	...	75
18	18Cr-8Ni-N	Smls. tube	SA-213	TP304LN	S30453	...	...	75
19	18Cr-8Ni-N	Plate	SA-240	304LN	S30453	...	...	75
20	18Cr-8Ni-N	Wld. tube	SA-249	TP304LN	S30453	...	...	75
21	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304LN	S30453	...	...	75
22	18Cr-8Ni-N	Smls. pipe	SA-376	TP304LN	S30453	...	...	75
23	18Cr-8Ni-N	Smls. & wld. ftgs.	SA-403	304LN	S30453	WP	...	75
24	18Cr-8Ni-N	Bar	SA-479	304LN	S30453	...	...	75
25	18Cr-8Ni-N	Wld. tube	SA-688	TP304LN	S30453	...	...	75
26	18Cr-8Ni-N	Wld. pipe	SA-813	TP304LN	S30453	...	...	75
27	18Cr-8Ni-N	Wld. pipe	SA-814	TP304LN	S30453	...	...	75
28	18Cr-8Ni-N	Forgings	SA-182	F304N	S30451	...	...	80
29	18Cr-8Ni-N	Smls. tube	SA-213	TP304N	S30451	...	...	80
30	18Cr-8Ni-N	Plate	SA-240	304N	S30451	...	...	80
31	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...	...	80
32	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304N	S30451	...	...	80
33	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	1	...	80
34	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	3	...	80
35	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	4	...	80
36	18Cr-8Ni-N	Smls. pipe	SA-376	TP304N	S30451	...	...	80
37	18Cr-8Ni-N	Smls. & wld. ftgs.	SA-403	304N	S30451	...	...	80
38	18Cr-8Ni-N	Bar	SA-479	304N	S30451	...	...	80
39	18Cr-8Ni-N	Wld. tube	SA-688	TP304N	S30451	...	...	80
40	18Cr-8Ni-N	Wld. pipe	SA-813	TP304N	S30451	...	...	80
41	18Cr-8Ni-N	Wld. pipe	SA-814	TP304N	S30451	...	...	80
42	18Cr-8Ni-N	Forgings	SA-965	F304N	S30451	...	...	80
43	18Cr-8Ni-N	Plate	SA/EN 10028-7	X2CrNiN18-10	...	...	≤3	80
44	18Cr-8Ni-N	Plate	SA/EN 10028-7	X5CrNiN19-9	...	...	≤3	80
45	18Cr-8Ni-Se	Bolting	SA-320	B8F	S30323	1	...	75

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
2	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
3	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
4	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
5	75.4	71.1	67.0	64.4	63.5	63.5	63.5	63.5	63.5	63.2	62.3	61.1	59.5	57.8
6	77.0	72.9	68.0	65.7	65.1	65.1	65.1	65.1	65.0	64.5	63.6	62.5	60.9	58.9
7	77.0	72.9	68.0	65.7	65.1	65.1	65.1	65.1	65.0	64.5	63.6	62.5	60.9	58.9
8	77.0	72.9	68.0	65.7	65.1	65.1	65.1	65.1	65.0	64.5	63.6	62.5	60.9	58.9
9	77.0	72.9	68.0	65.7	65.1	65.1	65.1	65.1	65.0	64.5	63.6	62.5	60.9	58.9
10	100.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	105.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	115.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	125.0	...	...	...	...	...	...	...	...	...	...	...	...	...
14	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
15	70.0	66.3	61.8	59.7	59.2	59.2	59.2	59.2	59.0	58.6	57.9	56.8	55.4	53.6
16	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
17	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
18	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
19	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
20	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
21	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
22	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
23	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
24	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
25	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
26	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
27	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
28	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
29	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
30	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
31	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
32	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
33	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
34	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
35	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
36	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
37	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
38	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
39	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
40	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
41	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
42	80.0	80.0	76.1	73.2	71.2	69.7	69.1	68.6	67.9	67.3	66.5	65.5	64.4	63.0
43	79.8	75.3	70.9	68.1	67.1	67.1	67.1	67.1	67.1	66.9	65.9	64.6	62.9	61.2
44	79.8	79.2	76.2	73.1	70.8	69.4	68.9	68.4	67.8	67.1	66.3	65.3	64.1	62.9
45	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)												
1	56.1	53.7	50.8	47.3	43.5	39.3	35.0	30.9	27.1	24.0	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	18Cr-8Ni-Se	Bolting	SA-320	B8FA	S30323	1A	...	75
2	18Cr-8Ni-4Si-N	Bar	SA-479	...	S21800	...	...	95
3	18Cr-9Ni-3Cu-Cb-N	Smls. tube	SA-213	...	S30432	...	...	86
4	18Cr-10Ni-Cb	Forgings	SA-965	F348H	S34809	...	...	65
5	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710	...	...	70
6	18Cr-10Ni-Cb	Cast pipe	SA-451	CPF8C	J92710	...	...	70
7	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...	>5	70
8	18Cr-10Ni-Cb	Forgings	SA-965	F347	S34700	...	...	70
9	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	>5	70
10	18Cr-10Ni-Cb	Forgings	SA-965	F347H	S34709	...	...	70
11	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	>5	70
12	18Cr-10Ni-Cb	Forgings	SA-965	F348	S34800	...	...	70
13	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	>5	70
14	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...	≤5	75
15	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	1	...	75
16	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347	S34700	...	...	75
17	18Cr-10Ni-Cb	Plate	SA-240	347	S34700	...	...	75
18	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...	...	75
19	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347	S34700	...	...	75
20	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	1	...	75
21	18Cr-10Ni-Cb	Bolting	SA-320	B8CA	S34700	1A	...	75
22	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	1	...	75
23	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	3	...	75
24	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	4	...	75
25	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347	S34700	...	...	75
26	18Cr-10Ni-Cb	Smls. & wld. ftgs.	SA-403	347	S34700	...	...	75
27	18Cr-10Ni-Cb	Wld. pipe	SA-409	TP347	S34700	...	...	75
28	18Cr-10Ni-Cb	Bar	SA-479	347	S34700	...	...	75
29	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347	S34700	...	...	75
30	18Cr-10Ni-Cb	Bar	SA/JIS G4303	SUS347	...	...	...	75
31	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...	≤5	75
32	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347H	S34709	...	...	75
33	18Cr-10Ni-Cb	Plate	SA-240	347H	S34709	...	...	75
34	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...	...	75
35	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347H	S34709	...	...	75
36	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347H	S34709	...	...	75
37	18Cr-10Ni-Cb	Smls. & wld. ftgs.	SA-403	347H	S34709	...	...	75
38	18Cr-10Ni-Cb	Bar	SA-479	347H	S34709	...	...	75
39	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347H	S34709	...	...	75
40	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP347H	S34709	...	...	75
41	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347LN	S34751	...	...	75
42	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347LN	S34751	...	...	75
43	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...	≤5	75
44	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348	S34800	...	...	75
45	18Cr-10Ni-Cb	Plate	SA-240	348	S34800	...	...	75

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
2	95.0	93.9	87.0	82.1	79.3	77.9	77.5	77.1	76.7	76.2	75.5	74.7	73.6	72.5
3	86.0	85.8	82.1	80.2	79.5	79.1	79.0	78.7	78.3	77.7	76.8	75.7	74.3	71.9
4	65.0	62.2	57.1	53.9	52.0	51.2	51.0	51.0	51.0	51.0	50.9	50.7	50.4	49.8
5	70.0	66.9	61.5	58.0	56.0	55.1	55.0	54.9	54.9	54.9	54.8	54.6	54.2	53.6
6	70.0	67.0	61.5	58.0	56.0	55.1	54.9	54.9	54.9	54.9	54.8	54.6	54.3	53.7
7	70.0	66.9	61.5	58.0	56.0	55.1	55.0	54.9	54.9	54.9	54.8	54.6	54.2	53.6
8	70.0	66.9	61.5	58.0	56.0	55.1	55.0	54.9	54.9	54.9	54.8	54.6	54.2	53.6
9	70.0	67.0	61.5	58.0	56.0	55.1	54.9	54.9	54.9	54.9	54.8	54.6	54.3	53.7
10	70.0	67.0	61.5	58.0	56.0	55.1	54.9	54.9	54.9	54.9	54.8	54.6	54.3	53.7
11	70.0	66.9	61.5	58.0	56.0	55.1	55.0	54.9	54.9	54.9	54.8	54.6	54.2	53.6
12	70.0	66.9	61.5	58.0	56.0	55.1	55.0	54.9	54.9	54.9	54.8	54.6	54.2	53.6
13	70.0	67.0	61.5	58.0	56.0	55.1	54.9	54.9	54.9	54.9	54.8	54.6	54.3	53.7
14	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
15	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
16	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
17	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
18	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
19	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
20	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
21	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
22	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
23	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
24	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
25	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
26	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
27	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
28	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
29	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
30	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
31	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
32	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
33	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
34	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
35	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
36	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
37	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
38	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
39	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
40	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
41	75.0	73.1	66.9	62.3	59.3	57.7	57.4	57.2	57.1	57.0	56.9	56.6	56.2	55.4
42	75.0	73.1	66.9	62.3	59.3	57.7	57.4	57.2	57.1	57.0	56.9	56.6	56.2	55.4
43	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
44	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
45	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	52.2	49.7	46.8	43.7	40.3	36.8	33.2	29.7	26.2	22.8	...	...	...
8	52.2	49.7	46.8	43.7	40.3	36.8	33.2	29.7	26.2	22.8	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	52.2	49.7	46.8	43.7	40.3	36.8	33.2	29.7	26.2	22.8	...	...	...
12	52.2	49.7	46.8	43.7	40.3	36.8	33.2	29.7	26.2	22.8	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
15	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
16	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
17	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
18	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
19	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
20	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
21	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
22	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
23	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
24	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
25	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
26	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
27	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
28	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
29	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
44	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
45	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...	...	75
2	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP348	S34800	...	...	75
3	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	1	...	75
4	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	3	...	75
5	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	4	...	75
6	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP348	S34800	...	...	75
7	18Cr-10Ni-Cb	Smls. & wld. ftgs.	SA-403	348	S34800	...	...	75
8	18Cr-10Ni-Cb	Wld. pipe	SA-409	TP348	S34800	...	...	75
9	18Cr-10Ni-Cb	Bar	SA-479	348	S34800	...	...	75
10	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348	S34800	...	...	75
11	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348	S34800	...	...	75
12	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...	≤5	75
13	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348H	S34809	...	...	75
14	18Cr-10Ni-Cb	Plate	SA-240	348H	S34809	...	...	75
15	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...	...	75
16	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP348H	S34809	...	...	75
17	18Cr-10Ni-Cb	Smls. & wld. ftgs.	SA-403	348H	S34809	...	...	75
18	18Cr-10Ni-Cb	Bar	SA-479	348H	S34809	...	...	75
19	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348H	S34809	...	...	75
20	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348H	S34809	...	...	75
21	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347HFG	S34710	...	...	80
22	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100
23	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$1 < t \leq 1\frac{1}{4}$	105
24	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$\frac{3}{4} < t \leq 1$	115
25	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2	$t \leq \frac{3}{4}$	125
26	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321	S32100	...	$>\frac{3}{8}$	70
27	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$>\frac{3}{8}$	70
28	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321H	S32109	...	$>\frac{3}{16}$	70
29	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	$>\frac{3}{8}$	70
30	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	>5	70
31	18Cr-10Ni-Ti	Forgings	SA-965	F321	S32100	...	...	70
32	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	>5	70
33	18Cr-10Ni-Ti	Forgings	SA-965	F321H	S32109	...	...	70
34	18Cr-10Ni-Ti	Plate	SA/EN 10028-7	X6CrNiTi18-10	...	...	≤3	73
35	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...	≤5	75
36	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	1	...	75
37	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...	...	75
38	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...	...	75
39	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...	...	75
40	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321	S32100	...	$\leq \frac{3}{8}$	75
41	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	1	...	75
42	18Cr-10Ni-Ti	Bolting	SA-320	B8TA	S32100	1A	...	75
43	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	1	...	75
44	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	3	...	75
45	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	4	...	75

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
2	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
3	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
4	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
5	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
6	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
7	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
8	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
9	75.0	71.7	65.9	62.1	60.0	59.1	58.9	58.8	58.8	58.8	58.7	58.5	58.1	57.5
10	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
11	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
12	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
13	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
14	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
15	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
16	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
17	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
18	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
19	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
20	75.0	71.8	65.9	62.1	60.0	59.0	58.9	58.8	58.8	58.8	58.7	58.5	58.2	57.5
21	80.0	77.7	72.8	69.6	67.7	66.7	66.4	66.2	66.0	65.8	65.4	64.9	64.3	63.3
22	100.0	...	...	...	...	...	...	...	...	...	...	...	...	...
23	105.0	...	...	...	...	...	...	...	...	...	...	...	...	...
24	115.0	...	...	...	...	...	...	...	...	...	...	...	...	...
25	125.0	...	...	...	...	...	...	...	...	...	...	...	...	...
26	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
27	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
28	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
29	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
30	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
31	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
32	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
33	70.0	66.4	62.4	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	61.1	59.6
34	72.5	68.5	65.4	63.5	62.8	62.8	62.8	62.8	62.8	62.8	62.8	62.8	62.6	62.1
35	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
36	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
37	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
38	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
39	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
40	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
41	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
42	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
43	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
44	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
45	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
2	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
3	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
4	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
5	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
6	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
7	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
8	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
9	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
10	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
11	55.9	53.2	50.1	46.8	43.2	39.4	35.6	31.8	28.1	24.5	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	57.6	55.6	53.1	50.4	47.4	44.2	40.8	37.3	33.8	30.2	...	...	...
27	57.6	55.6	53.1	50.4	47.4	44.2	40.8	37.3	33.8	30.2	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	57.6	55.6	53.1	50.4	47.4	44.2	40.8	37.3	33.8	30.2	...	...	...
31	57.6	55.6	53.1	50.4	47.4	44.2	40.8	37.3	33.8	30.2	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
36	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
37	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
38	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
39	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
40	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
41	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
42	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
43	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
44	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
45	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...	$\leq \frac{3}{8}$	75
2	18Cr-10Ni-Ti	Smls. & wld. ftgs.	SA-403	321	S32100	...	...	75
3	18Cr-10Ni-Ti	Wld. pipe	SA-409	TP321	S32100	...	...	75
4	18Cr-10Ni-Ti	Bar	SA-479	321	S32100	...	...	75
5	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321	S32100	...	...	75
6	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321	S32100	...	...	75
7	18Cr-10Ni-Ti	Bar	SA/JIS G4303	SUS321	...	...	...	75
8	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...	≤ 5	75
9	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321H	S32109	...	...	75
10	18Cr-10Ni-Ti	Plate	SA-240	321H	S32109	...	...	75
11	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...	...	75
12	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321H	S32109	...	$\leq \frac{3}{16}$	75
13	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...	$\leq \frac{3}{8}$	75
14	18Cr-10Ni-Ti	Smls. & wld. ftgs.	SA-403	321H	S32109	...	...	75
15	18Cr-10Ni-Ti	Bar	SA-479	321H	S32109	...	...	75
16	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321H	S32109	...	...	75
17	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321H	S32109	...	...	75
18	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100
19	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$1 < t \leq 1\frac{1}{4}$	105
20	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$\frac{3}{4} < t \leq 1$	115
21	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2	$t \leq \frac{3}{4}$	125
22	18Cr-11Ni	Plate	SA-240	305	S30500	...	...	75
(23) 23	18Cr-12Ni-2Mo	Castings	SA-351	CF3M	J92800	...	...	70
(23) 24	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF3M	J92800	...	...	70
(23) 25	18Cr-12Ni-2Mo	Castings	SA-351	CF8M	J92900	...	...	70
(23) 26	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF8M	J92900	...	...	70
27	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...	> 5	65
28	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...	≤ 5	70
29	18Cr-13Ni-3Mo	Forgings	SA-182	F317	S31700	...	≤ 5	75
30	18Cr-13Ni-3Mo	Plate	SA-240	317	S31700	...	...	75
31	18Cr-13Ni-3Mo	Plate	SA-240	317L	S31703	...	...	75
32	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...	...	75
33	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317L	S31703	...	...	75
34	18Cr-13Ni-3Mo	Smls. & wld. pipe	SA-312	TP317	S31700	...	...	75
35	18Cr-13Ni-3Mo	Smls. & wld. pipe	SA-312	TP317L	S31703	...	...	75
36	18Cr-13Ni-3Mo	Smls. & wld. ftgs.	SA-403	317	S31700	...	...	75
37	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	...	...	75
38	18Cr-15Ni-4Si	Forgings	SA-182	...	S30600	Solution ann.	...	78
39	18Cr-15Ni-4Si	Plate	SA-240	...	S30600	Solution ann.	≤ 2	78
40	18Cr-15Ni-4Si	Smls. & wld. pipe	SA-312	...	S30600	Solution ann.	...	78
41	18Cr-15Ni-4Si	Bar	SA-479	...	S30600	Solution ann.	≤ 4	78
42	18Cr-18Ni-2Si	Smls. tube	SA-213	XM-15	S38100	...	...	75
43	18Cr-18Ni-2Si	Plate	SA-240	XM-15	S38100	...	...	75
44	18Cr-18Ni-2Si	Wld. tube	SA-249	TPXM-15	S38100	...	...	75
45	18Cr-18Ni-2Si	Wld. pipe	SA-312	TPXM-15	S38100	...	...	75

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
2	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
3	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
4	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
5	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
6	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
7	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
8	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
9	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
10	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
11	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
12	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
13	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
14	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
15	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
16	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
17	75.0	71.1	66.9	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5	63.8
18	50.0	...	...	...	...	...	...	...	...	...	...	...	...	...
19	65.0	...	...	...	...	...	...	...	...	...	...	...	...	...
20	80.0	...	...	...	...	...	...	...	...	...	...	...	...	...
21	100.0	...	...	...	...	...	...	...	...	...	...	...	...	...
22	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
23	70.0	70.0	68.0	67.2	67.2	67.2	67.2	67.2	66.8	66.2	65.2	63.9	62.3	60.2
24	70.0	70.0	68.0	67.2	67.2	67.2	67.2	67.2	66.8	66.2	65.2	63.9	62.3	60.2
25	70.0	70.0	68.0	67.2	67.2	67.2	67.2	67.2	66.8	66.2	65.2	63.9	62.3	60.2
26	70.0	70.0	68.0	67.2	67.2	67.2	67.2	67.2	66.8	66.2	65.2	63.9	62.3	60.2
27	65.0	63.2	59.5	57.8	57.3	57.3	57.2	57.1	56.7	56.2	55.4	54.4	53.0	51.4
28	70.0	68.1	64.0	62.2	61.8	61.7	61.6	61.5	61.1	60.5	59.7	58.6	57.1	55.4
29	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
30	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
31	75.0	72.9	68.6	66.7	66.2	66.1	66.1	65.9	65.5	64.9	64.0	62.7	61.2	59.3
32	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
33	75.0	72.9	68.6	66.7	66.2	66.1	66.1	65.9	65.5	64.9	64.0	62.7	61.2	59.3
34	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
35	75.0	72.9	68.6	66.7	66.2	66.1	66.1	65.9	65.5	64.9	64.0	62.7	61.2	59.3
36	75.0	75.0	72.9	71.9	71.8	71.8	71.8	71.8	71.5	70.8	69.7	68.3	66.5	64.3
37	75.0	72.9	68.6	66.7	66.2	66.1	66.1	65.9	65.5	64.9	64.0	62.7	61.2	59.3
38	78.0	74.6	68.6	...	...	...	...	...	...	...	...	...	...	...
39	78.0	74.6	68.6	...	...	...	...	...	...	...	...	...	...	...
40	78.0	74.6	68.6	...	...	...	...	...	...	...	...	...	...	...
41	78.0	74.6	68.6	...	...	...	...	...	...	...	...	...	...	...
42	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
43	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
44	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
45	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
2	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
3	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
4	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
5	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
6	61.8	59.5	56.9	54.0	50.8	47.4	43.7	40.0	36.2	32.4	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	50.1	48.6	46.7	44.6	...	...	...	...	...	...	...	...	...
28	54.0	52.3	50.3	48.0	...	...	...	...	...	...	...	...	...
29	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
30	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
31	57.8	56.1	53.9	51.4	...	...	...	...	...	...	...	...	...
32	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
33	57.8	56.1	53.9	51.4	...	...	...	...	...	...	...	...	...
34	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
35	57.8	56.1	53.9	51.4	...	...	...	...	...	...	...	...	...
36	60.3	55.9	51.7	47.7	43.8	40.0	36.5	33.1	29.8	26.7	...	...	...
37	57.8	56.1	53.9	51.4	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	18Cr-20Ni-5.5Si	Smls. tube	SA-213	...	S32615	Solution ann.	...	80
2	18Cr-20Ni-5.5Si	Plate	SA-240	...	S32615	Solution ann.	...	80
3	18Cr-20Ni-5.5Si	Smls. & wld. pipe	SA-312	...	S32615	Solution ann.	...	80
4	18Cr-20Ni-5.5Si	Bar	SA-479	...	S32615	Solution ann.	...	80
5	19Cr-9Ni- $\frac{1}{2}$ Mo	Castings	SA-351	CF10	J92590	...	...	70
6	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B	...	95
7	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A	...	100
8	19Cr-9Ni-2Mo	Castings	SA-351	CF10M	...	...	...	70
9	19Cr-10Ni-3Mo	Castings	SA-351	CG8M	J93000	...	...	75
10	19Cr-15Ni-4Mo	Smls. tube	SA-213	...	S31725	...	...	75
11	19Cr-15Ni-4Mo	Plate	SA-240	...	S31725	...	...	75
12	19Cr-15Ni-4Mo	Wld. tube	SA-249	...	S31725	...	...	75
13	19Cr-15Ni-4Mo	Smls. & wld. pipe	SA-312	...	S31725	...	...	75
14	19Cr-15Ni-4Mo	Wld. pipe	SA-358	...	S31725	...	...	75
15	19Cr-15Ni-4Mo	Smls. pipe	SA-376	...	S31725	...	...	75
16	19Cr-15Ni-4Mo	Wld. pipe	SA-409	...	S31725	...	...	75
17	19Cr-15Ni-4Mo	Bar	SA-479	...	S31725	...	...	75
18	20Cr-3Ni-1.5Mo-N	Plate	SA-240	...	S32003	...	$>\frac{3}{16}$	95
19	20Cr-3Ni-1.5Mo-N	Wld. pipe	SA-790	...	S32003	...	...	95
20	20Cr-3Ni-1.5Mo-N	Sheet	SA-240	...	S32003	...	$\leq\frac{3}{16}$	100
21	20Cr-3Ni-1.5Mo-N	Smls. & wld. tube	SA-789	...	S32003	...	...	100
22	20Cr-10Ni	Bar	SA-479	ER308	S30880	...	...	75
23	20Cr-18Ni-6Mo	Castings	SA-351	CK3MCoN	J93254	...	...	80
24	20Cr-18Ni-6Mo	Forgings	SA-182	F44	S31254	...	...	94
25	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...	$t > 0.187$	95
26	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...	$t > 0.187$	95
27	20Cr-18Ni-6Mo	Smls. & wld. pipe	SA-312	...	S31254	...	$t > 0.187$	95
28	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...	$t \geq 0.187$	95
29	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...	$t \leq 0.187$	98
30	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...	$t \leq 0.187$	98
31	20Cr-18Ni-6Mo	Smls. & wld. pipe	SA-312	...	S31254	...	$t \leq 0.187$	98
32	20Cr-18Ni-6Mo	Plate	SA-240	...	S31254	...	$t \leq 0.187$	100
33	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...	$t < 0.187$	100
34	20.5Cr-8.8Ni-Mo-N	Plate	SA-240	...	S31655	...	...	92
35	21Cr-5Mn-1.5Ni-Cu-N	Plate	SA-240	...	S32101	...	$>\frac{3}{16}$	94
36	21Cr-5Mn-1.5Ni-Cu-N	Bar	SA-479	...	S32101	...	...	94
37	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. tube	SA-789	...	S32101	...	>0.187	94
38	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. pipe	SA-790	...	S32101	...	>0.187	94
39	21Cr-5Mn-1.5Ni-Cu-N	Fittings	SA-815	...	S32101	...	...	94
40	21Cr-5Mn-1.5Ni-Cu-N	Sheet, strip	SA-240	...	S32101	...	$\leq\frac{3}{16}$	101
41	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. tube	SA-789	...	S32101	...	≤ 0.187	101
42	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. pipe	SA-790	...	S32101	...	≤ 0.187	101
43	21Cr-6Ni-9Mn	Forgings	SA-182	FXM-11	S21904	...	...	90
44	21Cr-6Ni-9Mn	Smls. & wld. pipe	SA-312	TPXM-11	S21904	...	...	90
45	21Cr-6Ni-9Mn	Plate	SA-666	XM-11	S21904	...	...	90

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	80.0	79.6	76.0	73.6	...	...	...	...	...	...	...	...	...	...
2	80.0	79.6	76.0	73.6	...	...	...	...	...	...	...	...	...	...
3	80.0	79.6	76.0	73.6	...	...	...	...	...	...	...	...	...	...
4	80.0	79.6	76.0	73.6	...	...	...	...	...	...	...	...	...	...
5	70.0	66.4	62.1	60.1	59.4	59.3	59.2	59.1	58.8	58.4	57.7	56.8	55.6	54.0
6	95.0	93.7	88.4	85.1	83.2	82.2	81.8	81.3	80.7	79.9	78.8	77.3	75.4	73.0
7	100.0	98.6	93.0	89.6	87.6	86.5	86.1	85.6	84.9	84.1	82.9	81.4	79.4	76.8
8	70.0	69.9	68.2	67.7	67.4	66.6	66.0	65.3	64.5	63.7	62.8	61.9	61.0	60.0
9	75.0	72.8	68.8	66.8	66.1	66.0	66.0	66.0	65.9	65.5	65.0	64.0	62.7	60.8
10	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
11	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
12	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
13	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
14	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
15	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
16	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
17	75.0	72.7	68.5	66.6	66.1	66.1	66.1	65.9	65.6	64.9	64.0	62.8	61.2	59.2
18	95.0	92.1	86.6	85.8	85.8	85.8	85.8	85.8	85.8	85.8	85.8	...	...	...
19	95.0	92.1	86.6	85.8	85.8	85.8	85.8	85.8	85.8	85.8	85.8	...	...	...
20	100.0	97.0	91.2	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	...	...	...
21	100.0	97.0	91.2	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	...	...	...
22	75.0	71.0	66.2	64.0	63.4	63.4	63.4	63.4	63.3	62.8	62.0	60.8	59.3	57.4
23	80.0	80.0	76.0	72.5	70.0	68.4	68.0	67.7	67.4	67.0	66.4	...	...	...
24	94.0	94.0	89.4	85.2	82.2	80.4	79.9	79.5	79.2	78.7	78.0	...	...	...
25	95.0	95.0	90.4	86.1	83.1	81.3	80.8	80.3	80.0	79.5	78.8	...	...	...
26	95.0	95.0	90.4	86.1	83.1	81.3	80.8	80.3	80.0	79.5	78.8	...	...	...
27	95.0	95.0	90.4	86.1	83.1	81.3	80.8	80.3	80.0	79.5	78.8	...	...	...
28	95.0	95.0	90.4	86.1	83.1	81.3	80.8	80.3	80.0	79.5	78.8	...	...	...
29	98.0	98.0	93.2	88.8	85.7	83.8	83.3	82.9	82.6	82.0	81.3	...	...	...
30	98.0	98.0	93.2	88.8	85.7	83.8	83.3	82.9	82.6	82.0	81.3	...	...	...
31	98.0	98.0	93.2	88.8	85.7	83.8	83.3	82.9	82.6	82.0	81.3	...	...	...
32	100.0	100.0	95.1	90.6	87.5	85.6	85.0	84.6	84.2	83.3	83.0	...	...	...
33	100.0	100.0	95.1	90.6	87.5	85.6	85.0	84.6	84.2	83.3	83.0	...	...	...
34	92.1	90.8	85.1	81.3	78.5	77.3	76.6	76.1	75.4	74.6	73.6	...	...	...
35	94.0	94.0	89.5	86.5	86.3	86.3	86.3	...	...	...	...	...	...	...
36	94.0	94.0	89.5	86.5	86.3	86.3	86.3	...	...	...	...	...	...	...
37	94.0	94.0	89.5	86.5	86.3	86.3	86.3	...	...	...	...	...	...	...
38	94.0	94.0	89.5	86.5	86.3	86.3	86.3	...	...	...	...	...	...	...
39	94.0	94.0	89.5	86.5	86.3	86.3	86.3	...	...	...	...	...	...	...
40	101.0	101.0	96.2	92.9	92.7	92.7	92.7	...	...	...	...	...	...	...
41	101.0	101.0	96.2	92.9	92.7	92.7	92.7	...	...	...	...	...	...	...
42	101.0	101.0	96.2	92.9	92.7	92.7	92.7	...	...	...	...	...	...	...
43	90.0	90.0	84.1	79.7	76.9	75.3	74.6	74.0	73.2	72.3	71.1	69.6	67.8	65.7
44	90.0	90.0	84.1	79.7	76.9	75.3	74.6	74.0	73.2	72.3	71.1	69.6	67.8	65.7
45	90.0	90.0	84.1	79.7	76.9	75.3	74.6	74.0	73.2	72.3	71.1	69.6	67.8	65.7

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	21Cr-6Ni-9Mn	Forgings	SA-965	FXM-11	S21904	...	...	90
2	21Cr-11Ni-N	Forgings	SA-182	F45	S30815	...	...	87
3	21Cr-11Ni-N	Smls. tube	SA-213	...	S30815	...	...	87
4	21Cr-11Ni-N	Plate	SA-240	...	S30815	...	...	87
5	21Cr-11Ni-N	Wld. tube	SA-249	...	S30815	...	...	87
6	21Cr-11Ni-N	Smls. & wld. pipe	SA-312	...	S30815	...	...	87
7	21Cr-11Ni-N	Bar	SA-479	...	S30815	...	...	87
8	22Cr-2Ni-Mo-N	Forgings	SA-182	F66	S32202	...	...	94
9	22Cr-2Ni-Mo-N	Plate	SA-240	...	S32202	...	...	94
10	22Cr-2Ni-Mo-N	Bar	SA-479	...	S32202	...	...	94
11	22Cr-2Ni-Mo-N	Smls. & wld. tube	SA-789	...	S32202	...	...	94
12	22Cr-2Ni-Mo-N	Smls. & wld. pipe	SA-790	...	S32202	...	...	94
13	22Cr-2Ni-Mo-N	Smls. & wld. ftgs.	SA-815	...	S32202	...	...	94
14	22Cr-5Ni-3Mo-N	Castings	SA-995	4A	J92205	...	...	90
15	22Cr-5Ni-3Mo-N	Forgings	SA-182	F51	S31803	...	...	90
16	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...	...	90
17	22Cr-5Ni-3Mo-N	Bar	SA-479	...	S31803	...	...	90
18	22Cr-5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S31803	...	...	90
19	22Cr-5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S31803	...	...	90
20	22Cr-5Ni-3Mo-N	Smls. & wld. ftgs.	SA-815	...	S31803	...	...	90
21	22Cr-5Ni-3Mo-N	Forgings	SA-182	F60	S32205	...	...	95
22	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S32205	...	...	95
23	22Cr-5Ni-3Mo-N	Bar	SA-479	...	S32205	...	...	95
24	22Cr-5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S32205	...	...	95
25	22Cr-5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S32205	...	...	95
26	22Cr-5Ni-3Mo-N	Smls. & wld. ftgs.	SA-815	...	S32205	...	...	95
27	22Cr-13Ni-5Mn	Castings	SA-351	CG6MMN	J93790	...	...	85
28	22Cr-13Ni-5Mn	Forgings	SA-182	FXM-19	S20910	...	...	100
29	22Cr-13Ni-5Mn	Bolting	SA-193	B8R	S20910	Annealed	...	100
30	22Cr-13Ni-5Mn	Bolting	SA-193	B8RA	S20910	Annealed	...	100
31	22Cr-13Ni-5Mn	Smls. tube	SA-213	XM-19	S20910	...	...	100
32	22Cr-13Ni-5Mn	Plate	SA-240	XM-19	S20910	...	...	100
33	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...	...	100
34	22Cr-13Ni-5Mn	Smls. & wld. pipe	SA-312	TPXM-19	S20910	...	...	100
35	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	1	...	100
36	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	3	...	100
37	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	4	...	100
38	22Cr-13Ni-5Mn	Smls. & wld. ftgs.	SA-403	XM-19	S20910	...	...	100
39	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Annealed	...	100
40	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Hot rolled	$3 < t \leq 8$	100
41	22Cr-13Ni-5Mn	Wld. pipe	SA-813	TPXM-19	S20910	...	...	100
42	22Cr-13Ni-5Mn	Wld. pipe	SA-814	TPXM-19	S20910	...	...	100
43	22Cr-13Ni-5Mn	Forgings	SA-965	FXM-19	S20910	...	...	100
44	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Hot rolled	$2 < t \leq 3$	115
45	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Hot rolled	≤ 2	135

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	90.0	90.0	84.1	79.7	76.9	75.3	74.6	74.0	73.2	72.3	71.1	69.6	67.8	65.7
2	87.0	86.4	81.6	78.5	76.4	74.8	74.1	73.5	72.8	72.0	71.1	70.1	68.9	67.5
3	87.0	86.4	81.6	78.5	76.4	74.8	74.1	73.5	72.8	72.0	71.1	70.1	68.9	67.5
4	87.0	86.4	81.6	78.5	76.4	74.8	74.1	73.5	72.8	72.0	71.1	70.1	68.9	67.5
5	87.0	86.4	81.6	78.5	76.4	74.8	74.1	73.5	72.8	72.0	71.1	70.1	68.9	67.5
6	87.0	86.4	81.6	78.5	76.4	74.8	74.1	73.5	72.8	72.0	71.1	70.1	68.9	67.5
7	87.0	86.4	81.6	78.5	76.4	74.8	74.1	73.5	72.8	72.0	71.1	70.1	68.9	67.5
8	94.0	93.2	87.0	86.3	86.3	86.3	...	...	...	...	...	...	...	...
9	94.0	93.2	87.0	86.3	86.3	86.3	...	...	...	...	...	...	...	...
10	94.0	93.2	87.0	86.3	86.3	86.3	...	...	...	...	...	...	...	...
11	94.0	93.2	87.0	86.3	86.3	86.3	...	...	...	...	...	...	...	...
12	94.0	93.2	87.0	86.3	86.3	86.3	...	...	...	...	...	...	...	...
13	94.0	93.2	87.0	86.3	86.3	86.3	...	...	...	...	...	...	...	...
14	90.0	90.0	86.2	85.2	85.2	...	...	...	...	...	...	...	...	...
15	90.0	90.0	86.8	83.5	81.6	80.7	80.5	...	...	...	...	...	...	...
16	90.0	90.0	86.8	83.5	81.6	80.7	80.5	...	...	...	...	...	...	...
17	90.0	90.0	86.8	83.5	81.6	80.7	80.5	...	...	...	...	...	...	...
18	90.0	90.0	86.8	83.5	81.6	80.7	80.5	...	...	...	...	...	...	...
19	90.0	90.0	86.8	83.5	81.6	80.7	80.5	...	...	...	...	...	...	...
20	90.0	90.0	86.8	83.5	81.6	80.7	80.5	...	...	...	...	...	...	...
21	95.0	95.0	91.7	88.2	86.1	85.2	85.0	...	...	...	...	...	...	...
22	95.0	95.0	91.7	88.2	86.1	85.2	85.0	...	...	...	...	...	...	...
23	95.0	95.0	91.7	88.2	86.1	85.2	85.0	...	...	...	...	...	...	...
24	95.0	95.0	91.7	88.2	86.1	85.2	85.0	...	...	...	...	...	...	...
25	95.0	95.0	91.7	88.2	86.1	85.2	85.0	...	...	...	...	...	...	...
26	95.0	95.0	91.7	88.2	86.1	85.2	85.0	...	...	...	...	...	...	...
27	85.0	84.6	80.1	77.3	75.6	74.5	74.0	73.5	72.9	72.1	71.2	70.1	68.7	67.0
28	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
29	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
30	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
31	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
32	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
33	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
34	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
35	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
36	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
37	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
38	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
39	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
40	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
41	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
42	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
43	100.0	99.4	94.2	91.1	89.1	87.7	87.0	86.4	85.6	84.8	83.8	82.6	81.3	79.7
44	115.0	114.3	108.4	104.7	102.5	100.8	100.1	99.3	98.4	97.5	96.3	95.0	93.5	91.7
45	135.0	134.1	127.2	123.0	120.3	118.4	117.5	116.6	115.6	114.4	113.1	111.5	109.7	107.6

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
29	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
30	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
31	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
32	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
33	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
34	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
35	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
36	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
37	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
38	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
39	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
40	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
41	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
42	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
43	77.3	75.6	73.5	71.0	...	...	...	...	...	...	...	...	...
44	88.9	86.9	84.5	81.7	...	...	...	...	...	...	...	...	...
45	104.4	102.0	99.2	95.9	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	23Cr-4Ni-Mo-Cu-N	Plate	SA-240	...	S32304	...	...	87
2	23Cr-4Ni-Mo-Cu-N	Smls. & wld. tube	SA-789	...	S32304	...	>1	87
3	23Cr-4Ni-Mo-Cu-N	Smls. & wld. pipe	SA-790	...	S32304	...	...	87
4	23Cr-4Ni-Mo-Cu-N	Smls. & wld. tube	SA-789	...	S32304	...	≤1	100
5	23Cr-12Ni	Smls. & wld. ftgs.	SA-403	309	S30900	...	...	75
6	23Cr-12Ni	Smls. tube	SA-213	TP309S	S30908	...	...	75
7	23Cr-12Ni	Plate	SA-240	309S	S30908	...	...	75
8	23Cr-12Ni	Wld. tube	SA-249	TP309S	S30908	...	...	75
9	23Cr-12Ni	Smls. & wld. pipe	SA-312	TP309S	S30908	...	...	75
10	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	1	...	75
11	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	3	...	75
12	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	4	...	75
13	23Cr-12Ni	Bar	SA-479	309S	S30908	...	...	75
14	23Cr-12Ni	Wld. pipe	SA-813	TP309S	S30908	...	...	75
15	23Cr-12Ni	Wld. pipe	SA-814	TP309S	S30908	...	...	75
16	23Cr-12Ni	Bar	SA/JIS G4303	SUS309S	...	...	...	75
17	23Cr-12Ni	Smls. tube	SA-213	TP309H	S30909	...	...	75
18	23Cr-12Ni	Plate	SA-240	309H	S30909	...	...	75
19	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...	...	75
20	23Cr-12Ni	Smls. & wld. pipe	SA-312	TP309H	S30909	...	...	75
21	23Cr-12Ni	Bar	SA-479	309H	S30909	...	...	75
22	23Cr-12Ni-Cb	Smls. tube	SA-213	TP309Cb	S30940	...	...	75
23	23Cr-12Ni-Cb	Plate	SA-240	309Cb	S30940	...	...	75
24	23Cr-12Ni-Cb	Wld. tube	SA-249	TP309Cb	S30940	...	...	75
25	23Cr-12Ni-Cb	Smls. & wld. pipe	SA-312	TP309Cb	S30940	...	...	75
26	23Cr-12Ni-Cb	Bar	SA-479	309Cb	S30940	...	...	75
27	23Cr-12Ni-Cb	Wld. pipe	SA-813	TP309Cb	S30940	...	...	75
28	23Cr-12Ni-Cb	Wld. pipe	SA-814	TP309Cb	S30940	...	...	75
29	23Cr-25Ni-5.5Mo-N	Forgings	SA-182	...	S32053	...	...	93
30	23Cr-25Ni-5.5Mo-N	Bolting	SA-193	...	S32053	...	...	93
31	23Cr-25Ni-5.5Mo-N	Plate	SA-240	...	S32053	...	...	93
32	23Cr-25Ni-5.5Mo-N	Wld. tube	SA-249	...	S32053	...	...	93
33	23Cr-25Ni-5.5Mo-N	Smls. & wld. pipe	SA-312	...	S32053	...	...	93
34	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-358	...	S32053	...	...	93
35	23Cr-25Ni-5.5Mo-N	Fittings	SA-403	...	S32053	...	...	93
36	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-409	...	S32053	...	...	93
37	23Cr-25Ni-5.5Mo-N	Bar	SA-479	...	S32053	...	...	93
38	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-813	...	S32053	...	...	93
39	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-814	...	S32053	...	...	93
40	24Cr-10Ni-4Mo-N	Castings	SA-995	2A	J93345	...	...	95
41	24Cr-22Ni-6Mo-2W-Cu-N	Forgings	SA-182	F58	S31266	...	...	109
42	24Cr-22Ni-6Mo-2W-Cu-N	Smls. tube	SA-213	...	S31266	...	...	109
43	24Cr-22Ni-6Mo-2W-Cu-N	Plate	SA-240	...	S31266	...	...	109
44	24Cr-22Ni-6Mo-2W-Cu-N	Wld. tube	SA-249	...	S31266	...	...	109
45	24Cr-22Ni-6Mo-2W-Cu-N	Smls. & wld. pipe	SA-312	...	S31266	...	...	109

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)														
1	87.0	83.9	78.7	76.0	74.6	73.5	72.9	72.1	71.2	70.3	...	...	...	...
2	87.0	83.9	78.7	76.0	74.6	73.5	72.9	72.1	71.2	70.3	...	...	...	...
3	87.0	83.9	78.7	76.0	74.6	73.5	72.9	72.1	71.2	70.3	...	...	...	...
4	100.0	96.5	90.6	87.6	86.1	84.9	84.2	83.4	...	...	...	...	...	...
5	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
6	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
7	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
8	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
9	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
10	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
11	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
12	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
13	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
14	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
15	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
16	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
17	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
18	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
19	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
20	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
21	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
22	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
23	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
24	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
25	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
26	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
27	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
28	75.0	75.0	74.7	73.0	71.6	70.2	69.3	68.3	67.2	65.8	64.2	62.5	60.4	58.2
29	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
30	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
31	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
32	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
33	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
34	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
35	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
36	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
37	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
38	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
39	93.0	93.0	87.8	83.7	80.5	78.1	77.2	76.5	...	...	...	...	...	...
40	95.0	94.9	87.8	84.6	84.6	84.6	84.6	81.3	...	...	...	...	...	...
41	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
42	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
43	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
44	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
45	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
7	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
8	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
9	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
10	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
11	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
12	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
13	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
14	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
15	55.2	52.2	49.1	45.7	42.3	38.8	35.2	31.6	28.0	24.5	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
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30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
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41	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-358	...	S31266	...	...	109
2	24Cr-22Ni-6Mo-2W-Cu-N	Smls. & wld. fittings	SA-403	...	S31266	...	...	109
3	24Cr-22Ni-6Mo-2W-Cu-N	Bar, shapes	SA-479	...	S31266	...	...	109
4	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-813	...	S31266	...	...	109
5	25Cr-4Ni-4Mo-Ti	Plate	SA-240	...	S44635	...	...	90
6	25Cr-4Ni-4Mo-Ti	Wld. tube	SA-268	...	S44635	...	...	90
7	25Cr-5Ni-3Mo-2Cu	Castings	SA-995	1B	J93372	...	...	100
8	25Cr-5Ni-3Mo-2Cu	Plate	SA-240	...	S32550	...	...	110
9	25Cr-5Ni-3Mo-2Cu	Bar	SA-479	...	S32550	...	...	110
10	25Cr-5Ni-3Mo-2Cu	Smls. & wld. tube	SA-789	...	S32550	...	...	110
11	25Cr-5Ni-3Mo-2Cu	Smls. & wld. pipe	SA-790	...	S32550	...	...	110
12	25Cr-6Ni-Mo-N	Forgings	SA-182	...	S32506	...	...	90
13	25Cr-6Ni-Mo-N	Plate, sheet	SA-240	...	S32506	...	...	90
14	25Cr-6Ni-Mo-N	Bar	SA-479	...	S32506	...	...	90
15	25Cr-6Ni-Mo-N	Smls. tube	SA-789	...	S32506	...	...	90
16	25Cr-6Ni-Mo-N	Wld. tube	SA-789	...	S32506	...	...	90
17	25Cr-6Ni-Mo-N	Smls. pipe	SA-790	...	S32506	...	...	90
18	25Cr-6Ni-Mo-N	Wld. pipe	SA-790	...	S32506	...	...	90
19	25Cr-6Ni-Mo-N	Plate	SA-240	...	S31200	...	...	100
20	25Cr-6.5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S31260	...	...	100
21	25Cr-6.5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S31260	...	...	100
22	25Cr-6.5Ni-3Mo-N	Plate	SA-240	...	S31260	...	...	100
23	25Cr-7Ni-3Mo-W-Cu-N	Forgings	SA-182	F54	S39274	...	...	116
24	25Cr-7Ni-3Mo-W-Cu-N	Smls. & wld. tube	SA-789	...	S39274	...	...	116
25	25Cr-7Ni-3Mo-W-Cu-N	Smls. & wld. pipe	SA-790	...	S39274	...	...	116
26	25Cr-7Ni-4Mo-N	Forgings	SA-182	F53	S32750	...	...	116
27	25Cr-7Ni-4Mo-N	Plate	SA-240	...	S32750	...	...	116
28	25Cr-7Ni-4Mo-N	Smls. & wld. tube	SA-789	...	S32750	...	...	116
29	25Cr-7Ni-4Mo-N	Smls. & wld. pipe	SA-790	...	S32750	...	...	116
30	25Cr-7.5Ni-3.5Mo-N-Cu-W	Castings	SA-995	CD3MWCuN	J93380	...	...	100
31	25Cr-7.5Ni-3.5Mo-N-Cu-W	Forgings	SA-182	F55	S32760	...	...	109
32	25Cr-7.5Ni-3.5Mo-N-Cu-W	Plate	SA-240	...	S32760	...	...	109
33	25Cr-7.5Ni-3.5Mo-N-Cu-W	Bar	SA-479	...	S32760	Annealed	...	109
34	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. tube	SA-789	...	S32760	...	...	109
35	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. pipe	SA-790	...	S32760	...	...	109
36	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. ftgs.	SA-815	...	S32760	...	...	109
37	25Cr-12Ni	Castings	SA-351	CH8	J93400	...	...	65
38	25Cr-12Ni	Cast pipe	SA-451	CPH8	J93400	...	...	65
39	25Cr-12Ni	Castings	SA-351	CH20	J93402	...	...	70
40	25Cr-12Ni	Cast pipe	SA-451	CPH20	J93402	...	...	70
41	25Cr-20Ni	Castings	SA-351	CK20	J94202	...	...	65
42	25Cr-20Ni	Cast pipe	SA-451	CPK20	J94202	...	...	65
43	25Cr-20Ni	Forgings	SA-182	F310	S31000	...	≤5	75
44	25Cr-20Ni	Forgings	SA-965	F310	S31000	...	...	75
45	25Cr-20Ni	Smls. tube	SA-213	...	S31002	...	...	73

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
2	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
3	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
4	109.0	107.7	101.3	96.9	94.0	92.1	91.3	90.6	89.8	88.9	...	...	...	...
5	90.0	87.1	82.1	78.8	77.0	76.3	75.7	...	...	...	...	...	...	...
6	90.0	87.1	82.1	78.8	77.0	76.3	75.7	...	...	...	...	...	...	...
7	100.0	...	...	...	...	...	...	...	...	...	...	...	...	...
8	110.0	109.6	103.4	100.1	98.7	...	...	...	...	...	...	...	...	...
9	110.0	109.6	103.4	100.1	98.7	...	...	...	...	...	...	...	...	...
10	110.0	109.6	103.4	100.1	98.7	...	...	...	...	...	...	...	...	...
11	110.0	109.6	103.4	100.1	98.7	...	...	...	...	...	...	...	...	...
12	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
13	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
14	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
15	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
16	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
17	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
18	90.0	89.8	85.3	84.4	84.4	84.4	...	...	...	...	...	...	...	...
19	100.0	100.0	94.8	92.0	91.5	91.5	...	...	...	...	...	...	...	...
20	100.0	99.9	94.9	92.5	92.2	92.2	92.2	...	...	...	...	...	...	...
21	100.0	99.9	94.9	92.5	92.2	92.2	92.2	...	...	...	...	...	...	...
22	100.0	99.9	94.9	92.5	92.2	92.2	92.2	...	...	...	...	...	...	...
23	116.0	116.0	110.5	109.9	109.9	109.9	109.9	109.9	109.9	...	...	...	...	...
24	116.0	116.0	110.5	109.9	109.9	109.9	109.9	109.9	109.9	...	...	...	...	...
25	116.0	116.0	110.5	109.9	109.9	109.9	109.9	109.9	109.9	...	...	...	...	...
26	116.0	115.5	109.1	105.4	103.6	103.6	...	...	...	...	...	...	...	...
27	116.0	115.5	109.1	105.4	103.6	103.6	...	...	...	...	...	...	...	...
28	116.0	115.5	109.1	105.4	103.6	103.6	...	...	...	...	...	...	...	...
29	116.0	115.5	109.1	105.4	103.6	103.6	...	...	...	...	...	...	...	...
30	100.0	99.5	94.3	93.1	93.1	93.1	...	...	...	...	...	...	...	...
31	109.0	96.1	92.9	92.9	92.9	92.9	...	...	...	...	...	...	...	...
32	109.0	96.1	92.9	92.9	92.9	92.9	...	...	...	...	...	...	...	...
33	109.0	96.1	92.9	92.9	92.9	92.9	...	...	...	...	...	...	...	...
34	109.0	96.1	92.9	92.9	92.9	92.9	...	...	...	...	...	...	...	...
35	109.0	96.1	92.9	92.9	92.9	92.9	...	...	...	...	...	...	...	...
36	109.0	96.1	92.9	92.9	92.9	92.9	...	...	...	...	...	...	...	...
37	65.0	59.5	55.4	53.9	53.8	53.8	53.7	53.3	52.6	51.6	50.2	48.5	46.3	43.8
38	65.0	59.5	55.4	53.9	53.8	53.8	53.7	53.3	52.6	51.6	50.2	48.5	46.3	43.8
39	70.0	64.0	59.6	58.1	57.9	57.9	57.8	57.4	56.7	55.6	54.1	52.2	49.9	47.2
40	70.0	64.0	59.6	58.1	57.9	57.9	57.8	57.4	56.7	55.6	54.1	52.2	49.9	47.2
41	65.0	59.5	55.4	53.9	53.8	53.8	53.7	53.3	52.6	51.6	50.2	48.5	46.3	43.8
42	65.0	59.5	55.4	53.9	53.8	53.8	53.7	53.3	52.6	51.6	50.2	48.5	46.3	43.8
43	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
44	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
45	73.0	73.0	71.1	67.6	65.5	64.1	63.5	62.7	61.9	61.0	60.3	60.1	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
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27	...	...	...	...	...	...	...	...	...	...	...	...	...
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29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
(23) 1	25Cr-20Ni	Smls. pipe	SA-312	...	S31002	...	...	73
2	25Cr-20Ni	Smls. tube	SA-213	TP310S	S31008	...	...	75
3	25Cr-20Ni	Plate	SA-240	310S	S31008	...	...	75
4	25Cr-20Ni	Wld. tube	SA-249	TP310S	S31008	...	...	75
5	25Cr-20Ni	Smls. & wld. pipe	SA-312	TP310S	S31008	...	...	75
6	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	1	...	75
7	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	3	...	75
8	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	4	...	75
9	25Cr-20Ni	Smls. & wld. ftgs.	SA-403	310S	S31008	...	...	75
10	25Cr-20Ni	Bar	SA-479	310S	S31008	...	...	75
11	25Cr-20Ni	Wld. pipe	SA-813	TP310S	S31008	...	...	75
12	25Cr-20Ni	Wld. pipe	SA-814	TP310S	S31008	...	...	75
13	25Cr-20Ni	Bar	SA/JIS G4303	SUS310S	...	...	...	75
14	25Cr-20Ni	Smls. tube	SA-213	TP310H	S31009	...	...	75
15	25Cr-20Ni	Plate	SA-240	310H	S31009	...	...	75
16	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009	...	...	75
17	25Cr-20Ni	Smls. & wld. pipe	SA-312	TP310H	S31009	...	...	75
18	25Cr-20Ni	Bar	SA-479	310H	S31009	...	...	75
19	25Cr-20Ni-Cb	Smls. tube	SA-213	TP310Cb	S31040	...	...	75
20	25Cr-20Ni-Cb	Plate	SA-240	310Cb	S31040	...	...	75
21	25Cr-20Ni-Cb	Wld. tube	SA-249	TP310Cb	S31040	...	...	75
22	25Cr-20Ni-Cb	Smls. & wld. pipe	SA-312	TP310Cb	S31040	...	...	75
23	25Cr-20Ni-Cb	Bar	SA-479	310Cb	S31040	...	...	75
24	25Cr-20Ni-Cb	Wld. pipe	SA-813	TP310Cb	S31040	...	...	75
25	25Cr-20Ni-Cb	Wld. pipe	SA-814	TP310Cb	S31040	...	...	75
26	25Cr-20Ni-Cb-N	Smls. tube	SA-213	TP310HCbN	S31042	...	...	95
27	25Cr-22Ni-2Mo-N	Forgings	SA-182	F310MoLN	S31050	...	...	78
28	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	78
29	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	t > 0.250	78
30	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	78
31	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	0.250 < t ≤ 1.250	78
32	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...	≤0.250, wall	84
33	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...	t ≤ 0.250	84
34	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...	≤0.250, wall	84
35	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...	≤0.250, wall	84
36	26Cr-4Ni-Mo	Plate	SA-240	329	S32900	...	...	90
37	26Cr-4Ni-Mo	Smls. & wld. tube	SA-789	...	S32900	...	...	90
38	26Cr-4Ni-Mo	Smls. & wld. pipe	SA-790	...	S32900	...	...	90
39	26Cr-4Ni-Mo-N	Plate	SA-240	...	S32950	...	...	100
40	26Cr-4Ni-Mo-N	Smls. & wld. tube	SA-789	...	S32950	...	...	100
41	26Cr-4Ni-Mo-N	Smls. & wld. pipe	SA-790	...	S32950	...	...	100
(23) 42	27Cr-7.5Ni-4.5Mo-Co-N	Smls. tube	SA-789	...	S32707	...	...	133
(23) 43	27Cr-7.5Ni-4.5Mo-Co-N	Smls. pipe	SA-790	...	S32707	...	...	133
44	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	≥0.40	109
45	29Cr-6.5Ni-2Mo-N	Bar	SA-479	...	S32906	...	...	109

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)													
1	73.0	73.0	71.1	67.6	65.5	64.1	63.5	62.7	61.9	61.0	60.3	60.1	...	...
2	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
3	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
4	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
5	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
6	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
7	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
8	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
9	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
10	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
11	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
12	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
13	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
14	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
15	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
16	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
17	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
18	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
19	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
20	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
21	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
22	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
23	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
24	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
25	75.0	74.2	70.8	69.6	69.5	69.5	69.5	69.3	68.8	68.0	66.9	65.5	63.8	61.6
26	95.0	94.0	89.0	86.0	84.5	83.8	83.6	83.4	83.0	82.6	82.0	81.1	80.0	78.6
27	78.0	77.0	72.9	70.1	68.1	66.6	66.0	65.4	64.9	64.3	63.6	62.8	61.5	59.7
28	78.0	77.0	72.9	70.1	68.1	66.6	66.0	65.4	64.9	64.3	63.6	62.8	61.5	59.7
29	78.0	77.0	72.9	70.1	68.1	66.6	66.0	65.4	64.9	64.3	63.6	62.8	61.5	59.7
30	78.0	77.0	72.9	70.1	68.1	66.6	66.0	65.4	64.9	64.3	63.6	62.8	61.5	59.7
31	78.0	77.0	72.9	70.1	68.1	66.6	66.0	65.4	64.9	64.3	63.6	62.8	61.5	59.7
32	84.0	83.0	78.5	75.5	73.3	71.7	71.0	70.4	69.9	69.3	68.5	67.6	66.2	64.3
33	84.0	83.0	78.5	75.5	73.3	71.7	71.0	70.4	69.9	69.3	68.5	67.6	66.2	64.3
34	84.0	83.0	78.5	75.5	73.3	71.7	71.0	70.4	69.9	69.3	68.5	67.6	66.2	64.3
35	84.0	83.0	78.5	75.5	73.3	71.7	71.0	70.4	69.9	69.3	68.5	67.6	66.2	64.3
36	90.0	90.0	86.7	84.9	84.9	84.9	84.9	84.9	...	...	...	...	...	...
37	90.0	90.0	86.7	84.9	84.9	84.9	84.9	84.9	...	...	...	...	...	...
38	90.0	90.0	86.7	84.9	84.9	84.9	84.9	84.9	...	...	...	...	...	...
39	100.0	99.7	94.6	92.5	92.5	92.5	92.5	92.5	...	...	...	...	...	...
40	100.0	99.7	94.6	92.5	92.5	92.5	92.5	92.5	...	...	...	...	...	...
41	100.0	99.7	94.6	92.5	92.5	92.5	92.5	92.5	...	...	...	...	...	...
42	133.0	133.0	132.1	129.2	123.7	...	...	...	...	...	...	...	...	...
43	133.0	133.0	132.1	129.2	123.7	...	...	...	...	...	...	...	...	...
44	109.0	108.9	103.6	100.5	99.1	99.1	...	...	...	...	...	...	...	...
45	109.0	108.9	103.6	100.5	99.1	99.1	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
3	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
4	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
5	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
6	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
7	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
8	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
9	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
10	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
11	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
12	58.2	55.2	51.7	48.0	43.9	39.7	35.3	30.8	26.5	22.3	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)
(23)

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Ferrous Materials (Cont'd)								
1	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	≥0.40	109
2	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	≥0.40	109
3	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...	<0.40	116
4	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...	<0.40	116
5	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...	<0.40	116

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	1000
	Ferrous Materials (Cont'd)												
1	109.0	108.9	103.6	100.5	99.1	99.1	...	...	...	...	...	...	...
2	109.0	108.9	103.6	100.5	99.1	99.1	...	...	...	...	...	...	...
3	116.0	115.9	110.3	106.9	105.5	105.5	...	...	...	...	...	...	...
4	116.0	115.9	110.3	106.9	105.5	105.5	...	...	...	...	...	...	...
5	116.0	115.9	110.3	106.9	105.5	105.5	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials								
1	...	Plate, sheet	SB-209	...	Alclad 3003	O	0.006-0.499	13
2	...	Plate, sheet	SB-209	...	Alclad 3003	O	0.500-3.000	14
3	...	Plate, sheet	SB-209	...	Alclad 3003	H112	0.250-0.499	16
4	...	Plate, sheet	SB-209	...	Alclad 3003	H112	0.500-2.000	15
5	...	Plate, sheet	SB-209	...	Alclad 3003	H112	2.001-3.000	14.5
6	...	Plate, sheet	SB-209	...	Alclad 3003	H12	0.017-0.499	16
7	...	Plate, sheet	SB-209	...	Alclad 3003	H12	0.500-2.000	17
8	...	Plate, sheet	SB-209	...	Alclad 3003	H14	0.009-0.499	19
9	...	Plate, sheet	SB-209	...	Alclad 3003	H14	0.500-1.000	20
10	...	Drawn smls. tube	SB-210	...	Alclad 3003	O	0.010-0.500	13
11	...	Drawn smls. tube	SB-210	...	Alclad 3003	H113	0.050-0.500	13
12	...	Drawn smls. tube	SB-210	...	Alclad 3003	H14	0.010-0.500	19
13	...	Drawn smls. tube	SB-210	...	Alclad 3003	H18	0.010-0.500	26
14	...	Cond. & heat exch. tubes	SB-234	...	Alclad 3003	H14	0.010-0.200	19
15	...	Cond. & heat exch. tubes	SB-234	...	Alclad 3003	H25	0.010-0.200	21
16	...	Smls. extr. tube	SB-241	...	Alclad 3003	O	...	13
17	...	Smls. extr. tube	SB-241	...	Alclad 3003	H112	...	13
18	...	Plate, sheet	SB-209	...	Alclad 3004	O	0.006-0.499	21
19	...	Plate, sheet	SB-209	...	Alclad 3004	O	0.500-3.000	22
20	...	Plate, sheet	SB-209	...	Alclad 3004	H112	0.250-0.499	22
21	...	Plate, sheet	SB-209	...	Alclad 3004	H112	0.500-3.000	23
22	...	Plate, sheet	SB-209	...	Alclad 3004	H32	0.017-0.499	27
23	...	Plate, sheet	SB-209	...	Alclad 3004	H32	0.500-2.000	28
24	...	Plate, sheet	SB-209	...	Alclad 3004	H34	0.009-0.499	31
25	...	Plate, sheet	SB-209	...	Alclad 3004	H34	0.500-1.000	32
26	...	Plate, sheet	SB-209	...	Alclad 6061	T4	0.010-0.249	27
27	...	Plate, sheet	SB-209	...	Alclad 6061	T451	0.250-0.499	27
28	...	Plate, sheet	SB-209	...	Alclad 6061	T451	0.500-3.000	30
29	...	Plate, sheet	SB-209	...	Alclad 6061	T4 wld.	0.010-0.249	24
30	...	Plate, sheet	SB-209	...	Alclad 6061	T451 wld.	0.250-3.000	24
31	...	Plate, sheet	SB-209	...	Alclad 6061	T6	0.010-0.249	38
32	...	Plate, sheet	SB-209	...	Alclad 6061	T651	0.250-0.499	38
33	...	Plate, sheet	SB-209	...	Alclad 6061	T651	0.500-4.000	42
34	...	Plate, sheet	SB-209	...	Alclad 6061	T651	4.001-5.000	40
35	...	Plate, sheet	SB-209	...	Alclad 6061	T6 wld.	0.010-0.249	24
36	...	Plate, sheet	SB-209	...	Alclad 6061	T651 wld.	0.250-5.000	24
37	...	Castings	SB/EN 1706	...	AC-42000-S	T6	...	32
38	...	Plate, sheet	SB-209	...	A91060	O	0.006-3.000	8
39	...	Plate, sheet	SB-209	...	A91060	H112	0.250-0.499	11
40	...	Plate, sheet	SB-209	...	A91060	H112	0.500-1.000	10
41	...	Plate, sheet	SB-209	...	A91060	H112	1.001-3.000	9
42	...	Plate, sheet	SB-209	...	A91060	H12	0.017-2.000	11
43	...	Plate, sheet	SB-209	...	A91060	H14	0.009-1.000	12
44	...	Drawn smls. tube	SB-210	...	A91060	O	0.018-0.500	8.5
45	...	Drawn smls. tube	SB-210	...	A91060	H14	0.018-0.500	12

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials													
1	13.0	12.0	9.7	7.5	...	...	...	...	...	...	...	...	...	...
2	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
3	16.0	14.6	12.2	9.3	...	...	...	...	...	...	...	...	...	...
4	15.0	13.8	11.3	8.6	...	...	...	...	...	...	...	...	...	...
5	14.5	13.4	10.8	8.3	...	...	...	...	...	...	...	...	...	...
6	16.0	15.8	13.6	11.0	...	...	...	...	...	...	...	...	...	...
7	17.0	16.8	14.5	11.7	...	...	...	...	...	...	...	...	...	...
8	19.0	19.0	16.7	12.9	...	...	...	...	...	...	...	...	...	...
9	20.0	20.0	17.5	13.5	...	...	...	...	...	...	...	...	...	...
10	13.0	12.0	9.7	7.5	...	...	...	...	...	...	...	...	...	...
11	13.0	12.0	9.7	7.5	...	...	...	...	...	...	...	...	...	...
12	19.0	19.0	16.7	12.9	...	...	...	...	...	...	...	...	...	...
13	26.0	25.6	22.2	14.7	...	...	...	...	...	...	...	...	...	...
14	19.0	19.0	16.7	12.9	...	...	...	...	...	...	...	...	...	...
15	21.0	21.0	18.3	13.4	...	...	...	...	...	...	...	...	...	...
16	13.0	12.0	9.7	7.5	...	...	...	...	...	...	...	...	...	...
17	13.0	12.0	9.7	7.5	...	...	...	...	...	...	...	...	...	...
18	21.0	21.0	19.2	11.9	...	...	...	...	...	...	...	...	...	...
19	22.0	22.0	20.1	12.4	...	...	...	...	...	...	...	...	...	...
20	22.0	22.0	20.1	12.4	...	...	...	...	...	...	...	...	...	...
21	23.0	23.0	20.6	13.9	...	...	...	...	...	...	...	...	...	...
22	27.0	27.0	24.7	18.2	...	...	...	...	...	...	...	...	...	...
23	28.0	28.0	25.6	18.9	...	...	...	...	...	...	...	...	...	...
24	31.0	31.0	27.9	20.1	...	...	...	...	...	...	...	...	...	...
25	32.0	32.0	28.8	20.8	...	...	...	...	...	...	...	...	...	...
26	27.0	27.0	25.5	16.0	...	...	...	...	...	...	...	...	...	...
27	27.0	27.0	25.5	16.0	...	...	...	...	...	...	...	...	...	...
28	30.0	30.0	28.3	17.8	...	...	...	...	...	...	...	...	...	...
29	24.0	24.0	23.0	15.0	...	...	...	...	...	...	...	...	...	...
30	24.0	24.0	23.0	15.0	...	...	...	...	...	...	...	...	...	...
31	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
32	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
33	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
34	40.0	40.0	33.4	18.4	...	...	...	...	...	...	...	...	...	...
35	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
36	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
37	32.0	32.0	29.3	...	...	...	...	...	...	...	...	...	...	...
38	8.0	6.8	5.3	3.8	...	...	...	...	...	...	...	...	...	...
39	11.0	9.4	7.2	5.3	...	...	...	...	...	...	...	...	...	...
40	10.0	8.5	6.6	4.8	...	...	...	...	...	...	...	...	...	...
41	9.0	7.7	5.9	4.4	...	...	...	...	...	...	...	...	...	...
42	11.0	10.3	8.2	6.0	...	...	...	...	...	...	...	...	...	...
43	12.0	12.0	10.3	6.9	...	...	...	...	...	...	...	...	...	...
44	8.5	7.2	5.6	4.1	...	...	...	...	...	...	...	...	...	...
45	12.0	12.0	10.3	6.9	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Drawn smls. tube	SB-210	...	A91060	H113	0.018-0.500	8.5
2	...	Bar, rod, shapes	SB-221	...	A91060	O	...	8.5
3	...	Bar, rod, shapes	SB-221	...	A91060	H112	...	8.5
4	...	Cond. & heat exch. tubes	SB-234	...	A91060	H14	0.010-0.200	12
5	...	Smls. extr. tube	SB-241	...	A91060	O	...	8.5
6	...	Smls. extr. tube	SB-241	...	A91060	H112	...	8.5
7	...	Plate, sheet	SB-209	...	A91100	O	0.006-3.000	11
8	...	Plate, sheet	SB-209	...	A91100	H112	0.250-0.499	13
9	...	Plate, sheet	SB-209	...	A91100	H112	0.500-2.000	12
10	...	Plate, sheet	SB-209	...	A91100	H112	2.001-3.000	11.5
11	...	Plate, sheet	SB-209	...	A91100	H12	0.017-2.000	14
12	...	Plate, sheet	SB-209	...	A91100	H14	0.009-1.000	16
13	...	Bar, rod, shapes	SB-221	...	A91100	O	...	11
14	...	Bar, rod, shapes	SB-221	...	A91100	H112	...	11
15	...	Smls. extr. tube	SB-241	...	A91100	O	...	11
16	...	Smls. extr. tube	SB-241	...	A91100	H112	...	11
17	...	Plate, sheet	SB-209	...	A93003	O	0.006-3.000	14
18	...	Plate, sheet	SB-209	...	A93003	H112	0.250-0.499	17
19	...	Plate, sheet	SB-209	...	A93003	H112	0.500-2.000	15
20	...	Plate, sheet	SB-209	...	A93003	H112	2.001-3.000	14.5
21	...	Plate, sheet	SB-209	...	A93003	H12	0.017-2.000	17
22	...	Plate, sheet	SB-209	...	A93003	H14	0.009-1.000	20
23	...	Drawn smls. tube	SB-210	...	A93003	O	0.010-0.500	14
24	...	Drawn smls. tube	SB-210	...	A93003	H113	0.010-0.500	14
25	...	Drawn smls. tube	SB-210	...	A93003	H12	0.010-0.500	17
26	...	Drawn smls. tube	SB-210	...	A93003	H14	0.010-0.500	20
27	...	Drawn smls. tube	SB-210	...	A93003	H18	0.010-0.500	27
28	...	Bar, rod, shapes	SB-221	...	A93003	O	...	14
29	...	Bar, rod, shapes	SB-221	...	A93003	H112	...	14
30	...	Cond. & heat exch. tubes	SB-234	...	A93003	H14	0.010-0.200	20
31	...	Cond. & heat exch. tubes	SB-234	...	A93003	H25	0.010-0.200	22
32	...	Smls. extr. tube	SB-241	...	A93003	O	...	14
33	...	Smls. extr. tube	SB-241	...	A93003	H112	...	14
34	...	Smls. pipe	SB-241	...	A93003	H112	≥1.000	14
35	...	Smls. pipe	SB-241	...	A93003	H18	<1.000	27
36	...	Die forgings	SB-247	...	A93003	H112	≤4.000	14
37	...	Die forgings	SB-247	...	A93003	H112 wld.	≤4.000	14
38	...	Plate, sheet	SB-209	...	A93004	O	0.006-3.000	22
39	...	Plate, sheet	SB-209	...	A93004	H112	0.250-3.000	23
40	...	Plate, sheet	SB-209	...	A93004	H32	0.017-2.000	28
41	...	Plate, sheet	SB-209	...	A93004	H34	0.009-1.000	32
42	...	Plate, sheet	SB-209	...	A95052	O	0.006-3.000	25
43	...	Plate, sheet	SB-209	...	A95052	H112	0.250-0.499	28
44	...	Plate, sheet	SB-209	...	A95052	H112	0.500-3.000	25
45	...	Plate, sheet	SB-209	...	A95052	H32	0.017-2.000	31

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)														
1	8.5	7.2	5.6	4.1	...	...	...	...	...	...	...	...	...	...
2	8.5	7.2	5.6	4.1	...	...	...	...	...	...	...	...	...	...
3	8.5	7.2	5.6	4.1	...	...	...	...	...	...	...	...	...	...
4	12.0	12.0	10.3	6.9	...	...	...	...	...	...	...	...	...	...
5	8.5	7.2	5.6	4.1	...	...	...	...	...	...	...	...	...	...
6	8.5	7.2	5.6	4.1	...	...	...	...	...	...	...	...	...	...
7	11.0	10.2	8.0	5.3	...	...	...	...	...	...	...	...	...	...
8	13.0	12.1	9.5	6.6	...	...	...	...	...	...	...	...	...	...
9	12.0	11.2	8.8	6.0	...	...	...	...	...	...	...	...	...	...
10	11.5	10.7	8.4	5.9	...	...	...	...	...	...	...	...	...	...
11	14.0	13.9	11.7	9.1	...	...	...	...	...	...	...	...	...	...
12	16.0	16.0	13.2	9.7	...	...	...	...	...	...	...	...	...	...
13	11.0	10.2	8.0	5.3	...	...	...	...	...	...	...	...	...	...
14	11.0	10.2	8.0	5.3	...	...	...	...	...	...	...	...	...	...
15	11.0	10.2	8.0	5.3	...	...	...	...	...	...	...	...	...	...
16	11.0	10.2	8.0	5.3	...	...	...	...	...	...	...	...	...	...
17	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
18	17.0	15.5	13.0	9.9	...	...	...	...	...	...	...	...	...	...
19	15.0	13.8	11.3	8.6	...	...	...	...	...	...	...	...	...	...
20	14.5	13.3	10.9	8.3	...	...	...	...	...	...	...	...	...	...
21	17.0	16.8	14.5	11.7	...	...	...	...	...	...	...	...	...	...
22	20.0	20.0	17.5	13.5	...	...	...	...	...	...	...	...	...	...
23	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
24	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
25	17.0	16.8	14.5	11.7	...	...	...	...	...	...	...	...	...	...
26	20.0	20.0	17.5	13.5	...	...	...	...	...	...	...	...	...	...
27	27.0	26.5	23.0	15.3	...	...	...	...	...	...	...	...	...	...
28	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
29	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
30	20.0	20.0	17.5	13.5	...	...	...	...	...	...	...	...	...	...
31	22.0	22.0	19.1	14.1	...	...	...	...	...	...	...	...	...	...
32	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
33	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
34	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
35	27.0	26.5	23.0	15.3	...	...	...	...	...	...	...	...	...	...
36	14.0	12.9	10.5	8.0	...	...	...	...	...	...	...	...	...	...
37	14.0	13.0	10.6	8.4	...	...	...	...	...	...	...	...	...	...
38	22.0	22.0	20.1	12.4	...	...	...	...	...	...	...	...	...	...
39	23.0	23.0	20.6	13.9	...	...	...	...	...	...	...	...	...	...
40	28.0	28.0	25.6	18.9	...	...	...	...	...	...	...	...	...	...
41	32.0	32.0	28.8	20.8	...	...	...	...	...	...	...	...	...	...
42	25.0	25.0	23.9	17.3	...	...	...	...	...	...	...	...	...	...
43	28.0	28.0	26.7	19.4	...	...	...	...	...	...	...	...	...	...
44	25.0	25.0	23.9	17.3	...	...	...	...	...	...	...	...	...	...
45	31.0	31.0	28.0	21.2	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Plate, sheet	SB-209	...	A95052	H34	0.009-1.000	34
2	...	Drawn smls. tube	SB-210	...	A95052	O	0.010-0.450	25
3	...	Drawn smls. tube	SB-210	...	A95052	H32	0.010-0.450	31
4	...	Drawn smls. tube	SB-210	...	A95052	H34	0.010-0.450	34
5	...	Cond. & heat exch. tubes	SB-234	...	A95052	H32	0.010-0.200	31
6	...	Cond. & heat exch. tubes	SB-234	...	A95052	H34	0.010-0.200	34
7	...	Smls. extr. tube	SB-241	...	A95052	O	...	25
8	...	Plate, sheet	SB-209	...	A95083	O	0.051-0.500	40
9	...	Plate, sheet	SB-209	...	A95083	O	1.501-3.000	39
10	...	Plate, sheet	SB-209	...	A95083	O	3.001-5.000	38
11	...	Plate, sheet	SB-209	...	A95083	O	5.001-7.000	37
12	...	Plate, sheet	SB-209	...	A95083	O	7.001-8.000	36
13	...	Plate, sheet	SB-209	...	A95083	H112	0.250-1.500	40
14	...	Plate, sheet	SB-209	...	A95083	H112	1.501-3.000	39
15	...	Plate, sheet	SB-209	...	A95083	H32	0.125-1.500	44
16	...	Plate, sheet	SB-209	...	A95083	H32	1.501-3.000	41
17	...	Bar, rod, shapes	SB-221	...	A95083	O	≤5.000	39
18	...	Bar, rod, shapes	SB-221	...	A95083	H111	≤5.000	40
19	...	Bar, rod, shapes	SB-221	...	A95083	H112	≤5.000	39
20	...	Smls. extr. tube	SB-241	...	A95083	O	...	39
21	...	Smls. extr. tube	SB-241	...	A95083	H111	...	40
22	...	Smls. extr. tube	SB-241	...	A95083	H112	...	39
23	...	Die & hand forgings	SB-247	...	A95083	H111	≤4.000	39
24	...	Die & hand forgings	SB-247	...	A95083	H112	≤4.000	39
25	...	Die & hand forgings	SB-247	...	A95083	H111 wld.	≤4.000	38
26	...	Die & hand forgings	SB-247	...	A95083	H112 wld.	≤4.000	38
27	...	Plate, sheet	SB-928	...	A95083	H321	0.125-1.500	44
28	...	Plate, sheet	SB-928	...	A95083	H321	1.501-3.000	41
29	...	Plate, sheet	SB-209	...	A95086	O	0.020-2.000	35
30	...	Plate, sheet	SB-209	...	A95086	H112	0.188-0.499	36
31	...	Plate, sheet	SB-209	...	A95086	H112	0.500-2.000	35
32	...	Plate, sheet	SB-209	...	A95086	H112	2.001-3.000	34
33	...	Plate, sheet	SB-209	...	A95086	H32	0.020-2.000	40
34	...	Plate, sheet	SB-209	...	A95086	H34	0.009-1.000	44
35	...	Bar, rod, shapes	SB-221	...	A95086	H112	≤5.000	35
36	...	Smls. extr. tube	SB-241	...	A95086	O	...	35
37	...	Smls. extr. tube	SB-241	...	A95086	H111	...	36
38	...	Smls. extr. tube	SB-241	...	A95086	H112	...	35
39	...	Plate, sheet	SB-928	...	A95086	H116	0.063-2.000	40
40	...	Plate, sheet	SB-209	...	A95154	O	0.020-3.000	30
41	...	Plate, sheet	SB-209	...	A95154	H112	0.250-0.499	32
42	...	Plate, sheet	SB-209	...	A95154	H112	0.500-3.000	30
43	...	Plate, sheet	SB-209	...	A95154	H32	0.020-2.000	36
44	...	Plate, sheet	SB-209	...	A95154	H34	0.009-1.000	39
45	...	Drawn smls. tube	SB-210	...	A95154	O	0.010-0.450	30

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	34.0	34.0	33.1	25.4	...	...	...	...	...	...	...	...	...	...
2	25.0	25.0	23.9	17.3	...	...	...	...	...	...	...	...	...	...
3	31.0	31.0	28.0	21.2	...	...	...	...	...	...	...	...	...	...
4	34.0	34.0	33.1	25.4	...	...	...	...	...	...	...	...	...	...
5	31.0	31.0	28.0	21.2	...	...	...	...	...	...	...	...	...	...
6	34.0	34.0	33.1	25.4	...	...	...	...	...	...	...	...	...	...
7	25.0	25.0	23.9	17.3	...	...	...	...	...	...	...	...	...	...
8	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
9	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
10	38.0	...	...	...	...	...	...	...	...	...	...	...	...	...
11	37.0	...	...	...	...	...	...	...	...	...	...	...	...	...
12	36.0	...	...	...	...	...	...	...	...	...	...	...	...	...
13	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
14	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
15	44.0	...	...	...	...	...	...	...	...	...	...	...	...	...
16	41.0	...	...	...	...	...	...	...	...	...	...	...	...	...
17	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
18	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
19	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
20	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
21	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
22	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
23	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
24	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
25	38.0	...	...	...	...	...	...	...	...	...	...	...	...	...
26	38.0	...	...	...	...	...	...	...	...	...	...	...	...	...
27	44.0	...	...	...	...	...	...	...	...	...	...	...	...	...
28	41.0	...	...	...	...	...	...	...	...	...	...	...	...	...
29	35.0	...	...	...	...	...	...	...	...	...	...	...	...	...
30	36.0	...	...	...	...	...	...	...	...	...	...	...	...	...
31	35.0	...	...	...	...	...	...	...	...	...	...	...	...	...
32	34.0	...	...	...	...	...	...	...	...	...	...	...	...	...
33	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
34	44.0	...	...	...	...	...	...	...	...	...	...	...	...	...
35	35.0	...	...	...	...	...	...	...	...	...	...	...	...	...
36	35.0	...	...	...	...	...	...	...	...	...	...	...	...	...
37	36.0	...	...	...	...	...	...	...	...	...	...	...	...	...
38	35.0	...	...	...	...	...	...	...	...	...	...	...	...	...
39	40.0	...	...	...	...	...	...	...	...	...	...	...	...	...
40	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
41	32.0	...	...	...	...	...	...	...	...	...	...	...	...	...
42	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
43	36.0	...	...	...	...	...	...	...	...	...	...	...	...	...
44	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
45	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

INTENTIONALLY LEFT BLANK

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Drawn smls. tube	SB-210	...	A95154	H34	0.010-0.450	39
2	...	Bar, rod, shapes	SB-221	...	A95154	O	...	30
3	...	Bar, rod, shapes	SB-221	...	A95154	H112	...	30
4	...	Plate, sheet	SB-209	...	A95254	O	0.051-3.000	30
5	...	Plate, sheet	SB-209	...	A95254	H112	0.250-0.499	32
6	...	Plate, sheet	SB-209	...	A95254	H112	0.500-3.000	30
7	...	Plate, sheet	SB-209	...	A95254	H32	0.051-2.000	36
8	...	Plate, sheet	SB-209	...	A95254	H34	0.051-2.000	39
9	...	Plate, sheet	SB-209	...	A95454	O	0.020-3.000	31
10	...	Plate, sheet	SB-209	...	A95454	H112	0.250-0.499	32
11	...	Plate, sheet	SB-209	...	A95454	H112	0.500-3.000	31
12	...	Plate, sheet	SB-209	...	A95454	H32	0.020-2.000	36
13	...	Plate, sheet	SB-209	...	A95454	H34	0.020-1.000	39
14	...	Bar, rod, shapes	SB-221	...	A95454	O	≤5.000	31
15	...	Bar, rod, shapes	SB-221	...	A95454	H111	≤5.000	33
16	...	Bar, rod, shapes	SB-221	...	A95454	H112	≤5.000	31
17	...	Cond. & heat exch. tubes	SB-234	...	A95454	H32	0.010-0.200	36
18	...	Cond. & heat exch. tubes	SB-234	...	A95454	H34	0.010-0.200	39
19	...	Smls. extr. tube	SB-241	...	A95454	O	...	31
20	...	Smls. extr. tube	SB-241	...	A95454	H111	...	33
21	...	Smls. extr. tube	SB-241	...	A95454	H112	...	31
22	...	Plate, sheet	SB-209	...	A95456	O	0.051-1.500	42
23	...	Plate, sheet	SB-209	...	A95456	O	1.501-3.000	41
24	...	Plate, sheet	SB-209	...	A95456	O	3.001-5.000	40
25	...	Plate, sheet	SB-209	...	A95456	O	5.001-7.000	39
26	...	Plate, sheet	SB-209	...	A95456	O	7.001-8.000	38
27	...	Plate, sheet	SB-209	...	A95456	H112	0.250-1.500	42
28	...	Plate, sheet	SB-209	...	A95456	H112	1.501-3.000	41
29	...	Plate, sheet	SB-209	...	A95456	H32	0.188-0.499	46
30	...	Plate, sheet	SB-209	...	A95456	H32	0.500-1.500	44
31	...	Plate, sheet	SB-209	...	A95456	H32	1.501-3.000	41
32	...	Bar, rod, shapes	SB-221	...	A95456	O	≤5.000	41
33	...	Bar, rod, shapes	SB-221	...	A95456	H111	≤5.000	42
34	...	Bar, rod, shapes	SB-221	...	A95456	H112	≤5.000	41
35	...	Smls. extr. tube	SB-241	...	A95456	O	...	41
36	...	Smls. extr. tube	SB-241	...	A95456	H111	...	42
37	...	Smls. extr. tube	SB-241	...	A95456	H112	...	41
38	...	Plate, sheet	SB-928	...	A95456	H321	0.188-0.499	46
39	...	Plate, sheet	SB-928	...	A95456	H321	0.500-1.500	44
40	...	Plate, sheet	SB-928	...	A95456	H321	1.501-3.000	41
41	...	Plate, sheet	SB-209	...	A96061	T4	0.006-0.249	30
42	...	Plate, sheet	SB-209	...	A96061	T451	0.250-3.000	30
43	...	Plate, sheet	SB-209	...	A96061	T6	0.006-0.249	42
44	...	Plate, sheet	SB-209	...	A96061	T651	0.250-4.000	42
45	...	Plate, sheet	SB-209	...	A96061	T651	4.001-6.000	40

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)														
1	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
2	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
3	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
4	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
5	32.0	...	...	...	...	...	...	...	...	...	...	...	...	...
6	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...
7	36.0	...	...	...	...	...	...	...	...	...	...	...	...	...
8	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...
9	31.0	31.0	28.1	21.6	...	...	...	...	...	...	...	...	...	...
10	32.0	32.0	29.0	22.2	...	...	...	...	...	...	...	...	...	...
11	31.0	31.0	28.1	21.6	...	...	...	...	...	...	...	...	...	...
12	36.0	36.0	32.1	24.3	...	...	...	...	...	...	...	...	...	...
13	39.0	39.0	33.8	24.3	...	...	...	...	...	...	...	...	...	...
14	31.0	31.0	28.1	21.6	...	...	...	...	...	...	...	...	...	...
15	33.0	33.0	29.9	23.0	...	...	...	...	...	...	...	...	...	...
16	31.0	31.0	28.1	21.6	...	...	...	...	...	...	...	...	...	...
17	36.0	36.0	32.1	24.3	...	...	...	...	...	...	...	...	...	...
18	39.0	39.0	33.8	24.3	...	...	...	...	...	...	...	...	...	...
19	31.0	31.0	28.1	21.6	...	...	...	...	...	...	...	...	...	...
20	33.0	33.0	29.9	23.0	...	...	...	...	...	...	...	...	...	...
21	31.0	31.0	28.1	21.6	...	...	...	...	...	...	...	...	...	...
22	42.0	42.0	...	...	...	...	...	...	...	...	...	...	...	...
23	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
24	40.0	40.0	...	...	...	...	...	...	...	...	...	...	...	...
25	39.0	39.0	...	...	...	...	...	...	...	...	...	...	...	...
26	38.0	38.0	...	...	...	...	...	...	...	...	...	...	...	...
27	42.0	42.0	...	...	...	...	...	...	...	...	...	...	...	...
28	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
29	46.0	46.0	...	...	...	...	...	...	...	...	...	...	...	...
30	44.0	44.0	...	...	...	...	...	...	...	...	...	...	...	...
31	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
32	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
33	42.0	42.0	...	...	...	...	...	...	...	...	...	...	...	...
34	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
35	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
36	42.0	42.0	...	...	...	...	...	...	...	...	...	...	...	...
37	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
38	46.0	46.0	...	...	...	...	...	...	...	...	...	...	...	...
39	44.0	44.0	...	...	...	...	...	...	...	...	...	...	...	...
40	41.0	41.0	...	...	...	...	...	...	...	...	...	...	...	...
41	30.0	30.0	28.3	17.7	...	...	...	...	...	...	...	...	...	...
42	30.0	30.0	28.3	17.7	...	...	...	...	...	...	...	...	...	...
43	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
44	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
45	40.0	40.0	33.4	18.4	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Plate, sheet	SB-209	...	A96061	T4 wld.	0.006-0.249	24
2	...	Plate, sheet	SB-209	...	A96061	T451 wld.	0.250-3.000	24
3	...	Plate, sheet	SB-209	...	A96061	T6 wld.	0.006-0.249	24
4	...	Plate, sheet	SB-209	...	A96061	T651 wld.	0.250-6.000	24
5	...	Drawn smls. tube	SB-210	...	A96061	T4	0.025-0.500	30
6	...	Drawn smls. tube	SB-210	...	A96061	T6	0.025-0.500	42
7	...	Drawn smls. tube	SB-210	...	A96061	T4 wld.	0.025-0.500	24
8	...	Drawn smls. tube	SB-210	...	A96061	T6 wld.	0.025-0.500	24
9	...	Bar, rod, wire	SB-211	...	A96061	T6	0.125-8.000	42
10	...	Bar, rod, wire	SB-211	...	A96061	T651	0.125-8.000	42
11	...	Bar, rod, wire	SB-211	...	A96061	T6 wld.	0.125-8.000	24
12	...	Bar, rod, wire	SB-211	...	A96061	T651 wld.	0.125-8.000	24
13	...	Bar, rod, shapes	SB-221	...	A96061	T4	...	26
14	...	Bar, rod, shapes	SB-221	...	A96061	T6	...	38
15	...	Bar, rod, shapes	SB-221	...	A96061	T4 wld.	...	24
16	...	Bar, rod, shapes	SB-221	...	A96061	T6 wld.	...	24
17	...	Cond. & heat exch. tubes	SB-234	...	A96061	T4	0.025-0.200	30
18	...	Cond. & heat exch. tubes	SB-234	...	A96061	T6	0.025-0.200	42
19	...	Cond. & heat exch. tubes	SB-234	...	A96061	T4 wld.	0.025-0.200	24
20	...	Cond. & heat exch. tubes	SB-234	...	A96061	T6 wld.	0.025-0.200	24
21	...	Smls. extr. tube	SB-241	...	A96061	T4	...	26
22	...	Smls. extr. tube	SB-241	...	A96061	T6	...	38
23	...	Smls. extr. tube	SB-241	...	A96061	T4 wld.	...	24
24	...	Smls. extr. tube	SB-241	...	A96061	T6 wld.	...	24
25	...	Smls. pipe	SB-241	...	A96061	T6 drawn	<1.000	42
26	...	Smls. pipe	SB-241	...	A96061	T6	≥1.000	38
27	...	Smls. pipe	SB-241	...	A96061	T6 wld.	...	24
28	...	Die forgings	SB-247	...	A96061	T6	≤4.000	38
29	...	Hand forgings	SB-247	...	A96061	T6	≤4.000	37
30	...	Hand forgings	SB-247	...	A96061	T6	4.001-8.000	35
31	...	Die & hand forgings	SB-247	...	A96061	T6 wld.	≤8.000	24
32	...	Shapes	SB-308	...	A96061	T6	...	38
33	...	Shapes	SB-308	...	A96061	T6 wld.	...	24
34	...	Drawn smls. tube	SB-210	...	A96063	T6	0.025-0.500	33
35	...	Drawn smls. tube	SB-210	...	A96063	T6 wld.	0.025-0.500	17
36	...	Bar, rod, shapes	SB-221	...	A96063	T1	≤5.000	17
37	...	Bar, rod, shapes	SB-221	...	A96063	T1	0.501-1.000	16
38	...	Bar, rod, shapes	SB-221	...	A96063	T5	≤0.500	22
39	...	Bar, rod, shapes	SB-221	...	A96063	T5	0.501-1.000	21
40	...	Bar, rod, shapes	SB-221	...	A96063	T6	≤1.000	30
41	...	Bar, rod, shapes	SB-221	...	A96063	T6 wld.	≤1.000	17
42	...	Smls. extr. tube	SB-241	...	A96063	O	...	16
43	...	Smls. extr. tube	SB-241	...	A96063	T1	≤0.500	17
44	...	Smls. extr. tube	SB-241	...	A96063	T1	0.501-1.000	16
45	...	Smls. extr. tube	SB-241	...	A96063	T5	≤0.500	22

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)														
1	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
2	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
3	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
4	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
5	30.0	30.0	28.3	17.7	...	...	...	...	...	...	...	...	...	...
6	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
7	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
8	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
9	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
10	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
11	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
12	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
13	26.0	26.0	24.6	15.4	...	...	...	...	...	...	...	...	...	...
14	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
15	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
16	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
17	30.0	30.0	28.3	17.7	...	...	...	...	...	...	...	...	...	...
18	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
19	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
20	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
21	26.0	26.0	24.6	15.4	...	...	...	...	...	...	...	...	...	...
22	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
23	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
24	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
25	42.0	42.0	35.1	19.3	...	...	...	...	...	...	...	...	...	...
26	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
27	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
28	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
29	37.0	37.0	33.0	18.5	...	...	...	...	...	...	...	...	...	...
30	35.0	35.0	33.1	20.7	...	...	...	...	...	...	...	...	...	...
31	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
32	38.0	38.0	31.7	17.5	...	...	...	...	...	...	...	...	...	...
33	24.0	24.0	23.2	15.5	...	...	...	...	...	...	...	...	...	...
34	33.0	33.0	22.2	9.6	...	...	...	...	...	...	...	...	...	...
35	17.0	17.0	15.4	3.9	...	...	...	...	...	...	...	...	...	...
36	17.0	17.0	17.0	8.7	...	...	...	...	...	...	...	...	...	...
37	16.0	16.0	16.0	8.7	...	...	...	...	...	...	...	...	...	...
38	22.0	21.4	18.2	8.7	...	...	...	...	...	...	...	...	...	...
39	21.0	20.5	17.3	8.7	...	...	...	...	...	...	...	...	...	...
40	30.0	29.9	20.4	9.0	...	...	...	...	...	...	...	...	...	...
41	17.0	17.0	15.4	3.9	...	...	...	...	...	...	...	...	...	...
42	16.0	16.0	16.0	...	...	...	...	...	...	...	...	...	...	...
43	17.0	17.0	17.0	...	...	...	...	...	...	...	...	...	...	...
44	16.0	16.0	16.0	...	...	...	...	...	...	...	...	...	...	...
45	22.0	21.4	18.2	8.7	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Smls. extr. tube	SB-241	...	A96063	T5	0.501-1.000	21
2	...	Smls. extr. tube/pipe	SB-241	...	A96063	T6	≤1.000	30
3	...	Smls. extr. tube	SB-241	...	A96063	T5 wld.	≤1.000	17
4	...	Smls. extr. tube/pipe	SB-241	...	A96063	T6 wld.	≤1.000	17
5	...	Smls. pipe	SB-241	...	A96063	O	...	16
(23) 6	...	Castings	SB/EN 1706	AlSi7Mg	AC-42000	...	...	20
(23) 7	...	Castings	SB/EN 1706	...	AC-44300	F	...	35
(23) 8	...	Bar, rod	SB-187	...	C10200	O60	All	28
9	...	Smls. tube	SB-75	...	C10200	O60	All	30
10	...	Smls. pipe	SB-42	...	C10200	O61	All	30
11	...	Plate, sheet, strip	SB-152	...	C10200	H00	...	30
12	...	Plate, sheet, strip	SB-152	...	C10200	H01	...	30
13	...	Plate, sheet, strip	SB-152	...	C10200	H02	...	30
14	...	Plate, sheet, strip	SB-152	...	C10200	H03	...	30
15	...	Plate, sheet, strip	SB-152	...	C10200	H04	...	30
16	...	Plate, sheet, strip	SB-152	...	C10200	M20, O25	...	30
17	...	Smls. pipe	SB-42	...	C10200	H55	2 < NPS ≤ 12	36
18	...	Smls. tube	SB-75	...	C10200	H55	All	36
19	...	Smls. cond. tube	SB-111	...	C10200	H55	...	36
20	...	Smls. U-bend tube	SB-395	...	C10200	H55	...	36
21	...	Smls. pipe	SB-42	...	C10200	H80	$\frac{1}{8}$ < NPS ≤ 2	45
22	...	Smls. tube	SB-75	...	C10200	H80	<4	45
23	...	Smls. cond. tube	SB-111	...	C10200	H80	...	45
24	...	Plate, sheet, strip	SB-152	...	C10400	H00	...	30
25	...	Plate, sheet, strip	SB-152	...	C10400	H01	...	30
26	...	Plate, sheet, strip	SB-152	...	C10400	H02	...	30
27	...	Plate, sheet, strip	SB-152	...	C10400	H03	...	30
28	...	Plate, sheet, strip	SB-152	...	C10400	H04	...	30
29	...	Plate, sheet, strip	SB-152	...	C10400	M20, O25	...	30
30	...	Plate, sheet, strip	SB-152	...	C10500	H00	...	30
31	...	Plate, sheet, strip	SB-152	...	C10500	H01	...	30
32	...	Plate, sheet, strip	SB-152	...	C10500	H02	...	30
33	...	Plate, sheet, strip	SB-152	...	C10500	H03	...	30
34	...	Plate, sheet, strip	SB-152	...	C10500	H04	...	30
35	...	Plate, sheet, strip	SB-152	...	C10500	M20, O25	...	30
36	...	Plate, sheet, strip	SB-152	...	C10700	H00	...	30
37	...	Plate, sheet, strip	SB-152	...	C10700	H01	...	30
38	...	Plate, sheet, strip	SB-152	...	C10700	H02	...	30
39	...	Plate, sheet, strip	SB-152	...	C10700	H03	...	30
40	...	Plate, sheet, strip	SB-152	...	C10700	H04	...	30
41	...	Plate, sheet, strip	SB-152	...	C10700	M20, O25	...	30
(23) 42	...	Bar	SB-187	...	C11000	H04	All	28
43	...	Bar, rod	SB-187	...	C11000	O60	All	28
44	...	Plate, sheet, strip, bar	SB-152	...	C11000	H00	...	30
45	...	Plate, sheet, strip, bar	SB-152	...	C11000	H01	...	30

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	21.0	20.5	17.3	8.7	...	...	...	...	...	...	...	...	...	...
2	30.0	30.0	20.2	8.7	...	...	...	...	...	...	...	...	...	...
3	17.0	17.0	15.4	3.9	...	...	...	...	...	...	...	...	...	...
4	17.0	17.0	15.4	3.9	...	...	...	...	...	...	...	...	...	...
5	16.0	16.0	16.0	...	...	...	...	...	...	...	...	...	...	...
6	20.3	19.7	19.0	...	...	...	...	...	...	...	...	...	...	...
7	34.8	30.5	30.5	...	...	...	...	...	...	...	...	...	...	...
8	28.0	27.4	25.4	23.3	...	...	...	...	...	...	...	...	...	...
9	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
10	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
11	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
12	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
13	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
14	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
15	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
16	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
17	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
18	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
19	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
20	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
21	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
22	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
23	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
24	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
25	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
26	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
27	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
28	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
29	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
30	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
31	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
32	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
33	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
34	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
35	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
36	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
37	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
38	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
39	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
40	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
41	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
42	28.0	27.4	25.4	23.3	...	...	...	...	...	...	...	...	...	...
43	28.0	27.4	25.4	23.3	...	...	...	...	...	...	...	...	...	...
44	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
45	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)
(23)
(23)

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Plate, sheet, strip, bar	SB-152	...	C11000	H02	...	30
2	...	Plate, sheet, strip, bar	SB-152	...	C11000	H03	...	30
3	...	Plate, sheet, strip, bar	SB-152	...	C11000	H04	...	30
4	...	Plate, sheet, strip, bar	SB-152	...	C11000	M20, O25	...	30
5	...	Smls. tube	SB-75	...	C12000	O50	All	30
6	...	Smls. tube	SB-75	...	C12000	O60	All	30
7	...	Smls. pipe	SB-42	...	C12000	O61	All	30
8	...	Smls. pipe	SB-42	...	C12000	H55	2 < NPS ≤ 12	36
9	...	Smls. tube	SB-75	...	C12000	H55	All	36
10	...	Smls. cond. tube	SB-111	...	C12000	H55	...	36
11	...	Smls. U-bend tube	SB-395	...	C12000	H55	...	36
12	...	Smls. pipe	SB-42	...	C12000	H80	1/8 < NPS ≤ 2	45
13	...	Smls. tube	SB-75	...	C12000	H80	<4	45
14	...	Smls. cond. tube	SB-111	...	C12000	H80	...	45
15	...	Smls. tube	SB-75	...	C12200	O50	All	30
16	...	Smls. tube	SB-75	...	C12200	O60	All	30
17	...	Smls. pipe	SB-42	...	C12200	O61	All	30
18	...	Finned tube	SB-359	...	C12200	O61	...	30
19	...	Wld. cond. tube	SB-543	...	C12200	W061	...	30
20	...	Finned tube	SB-359	...	C12200	O62	...	30
21	...	Plate, sheet, strip	SB-152	...	C12200	H00	...	30
22	...	Plate, sheet, strip	SB-152	...	C12200	H01	...	30
23	...	Plate, sheet, strip	SB-152	...	C12200	H02	...	30
24	...	Plate, sheet, strip	SB-152	...	C12200	H03	...	30
25	...	Plate, sheet, strip	SB-152	...	C12200	H04	...	30
26	...	Plate, sheet, strip	SB-152	...	C12200	M20, O25	...	30
27	...	Wld. cond. tube	SB-543	...	C12200	WC55	...	32
28	...	Smls. pipe	SB-42	...	C12200	H55	2 < NPS ≤ 12	36
29	...	Smls. tube	SB-75	...	C12200	H55	All	36
30	...	Smls. cond. tube	SB-111	...	C12200	H55	...	36
31	...	Finned tube	SB-359	...	C12200	H55	...	36
32	...	Smls. U-bend tube	SB-395	...	C12200	H55	...	36
33	...	Smls. pipe	SB-42	...	C12200	H80	1/8 < NPS ≤ 2	45
34	...	Smls. cond. tube	SB-75	...	C12200	H80	<4	45
35	...	Smls. tube	SB-111	...	C12200	H80	...	45
36	...	Plate, sheet, strip, bar	SB-152	...	C12300	H00	...	30
37	...	Plate, sheet, strip, bar	SB-152	...	C12300	H01	...	30
38	...	Plate, sheet, strip, bar	SB-152	...	C12300	H02	...	30
39	...	Plate, sheet, strip, bar	SB-152	...	C12300	H03	...	30
40	...	Plate, sheet, strip, bar	SB-152	...	C12300	H04	...	30
41	...	Plate, sheet, strip, bar	SB-152	...	C12300	M20, O25	...	30
42	...	Plate, sheet, strip	SB-152	...	C14200	M20, O25	...	30
43	...	Smls. cond. tube	SB-111	...	C14200	H55	...	36
44	...	Smls. U-bend tube	SB-395	...	C14200	H55	...	36
45	...	Smls. cond. tube	SB-111	...	C14200	H80	...	45

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
2	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
3	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
4	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
5	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
6	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
7	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
8	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
9	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
10	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
11	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
12	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
13	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
14	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
15	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
16	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
17	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
18	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
19	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
20	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
21	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
22	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
23	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
24	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
25	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
26	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
27	32.0	32.0	31.0	29.3	...	...	...	...	...	...	...	...	...	...
28	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
29	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
30	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
31	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
32	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
33	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
34	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
35	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...
36	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
37	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
38	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
39	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
40	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
41	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
42	30.0	29.4	27.2	25.0	...	...	...	...	...	...	...	...	...	...
43	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
44	36.0	36.0	34.9	32.9	...	...	...	...	...	...	...	...	...	...
45	45.0	45.0	43.9	38.2	...	...	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Smls. cond. tube	SB-111	...	C19200	O61	...	38
2	...	Smls. U-bend tube	SB-395	...	C19200	O61	...	38
3	...	Wld. cond. tube	SB-543	...	C19400	W061	...	45
4	...	Wld. cond. tube	SB-543	...	C19400	WC55	...	45
5	...	Smls. pipe	SB-43	...	C23000	O61 and H58	...	40
6	...	Smls. cond. tube	SB-111	...	C23000	O61	...	40
7	...	Smls. tube	SB-135	...	C23000	O50 and O60	...	40
8	...	Smls. U-bend tube	SB-395	...	C23000	O61	...	40
9	...	Wld. cond. tube	SB-543	...	C23000	W061 and WC55	...	40
10	...	Smls. tube	SB-111	...	C28000	O25	...	50
11	...	Plate	SB-171	...	C36500	O25 and M20	>3.5 to ≤ 5	40
12	...	Plate	SB-171	...	C36500	O25 and M20	>2 to ≤ 3.5	45
13	...	Plate	SB-171	...	C36500	O25 and M20	≤2	50
(23) 14	...	Forgings	SB-283	...	C37700	M10, M11, O20	>1½	46
(23) 15	...	Forgings	SB-283	...	C37700	M10, M11, O20	≤1½	50
16	...	Plate	SB-171	...	C44300	M10, M20	≤4	45
17	...	Plate	SB-171	...	C44300	O20, O25	≤4	45
18	...	Smls. cond. tube	SB-111	...	C44300	O61	...	45
19	...	Finned tube	SB-359	...	C44300	O61	...	45
20	...	Smls. U-bend tube	SB-395	...	C44300	O61	...	45
21	...	Wld. cond. tube	SB-543	...	C44300	W061	...	45
22	...	Plate	SB-171	...	C44400	M10, M20	≤4	45
23	...	Plate	SB-171	...	C44400	O20, O25	≤4	45
24	...	Smls. cond. tube	SB-111	...	C44400	O61	...	45
25	...	Finned tube	SB-359	...	C44400	O61	...	45
26	...	Smls. U-bend tube	SB-395	...	C44400	O61	...	45
27	...	Wld. cond. tube	SB-543	...	C44400	W061	...	45
28	...	Plate	SB-171	...	C44500	M10, M20	≤4	45
29	...	Plate	SB-171	...	C44500	O20, O25	≤4	45
30	...	Smls. cond. tube	SB-111	...	C44500	O61	...	45
31	...	Finned tube	SB-359	...	C44500	O61	...	45
32	...	Smls. U-bend tube	SB-395	...	C44500	O61	...	45
33	...	Wld. cond. tube	SB-543	...	C44500	W061	...	45
34	...	Plate	SB-171	...	C46400	M10, M20, O20, O25	≤5	50
35	...	Plate	SB-171	...	C46500	M10, M20, O20, O25	≤5	50
36	...	Smls. cond. tube	SB-111	...	C60800	O61	...	50
37	...	Smls. U-bend tube	SB-395	...	C60800	O61	...	50
38	...	Plate, sheet	SB-169	...	C61400	O25 or O60	2 < t ≤ 5	65
39	...	Plate	SB-171	...	C61400	M10, M20, O20, O25	2 < t ≤ 5	65
40	...	Plate, sheet	SB-169	...	C61400	O25 or O60	½ < t ≤ 2	70
41	...	Plate	SB-171	...	C61400	M10, M20, O20, O25	≤2	70
42	...	Plate, sheet	SB-169	...	C61400	O25 or O60	≤½	72
43	...	Plate	SB-171	...	C63000	M10, M20, O20, O25	3.5 < t ≤ 5	80
44	...	Bar, rod	SB-150	...	C63000	M20, M30	>4	80
45	...	Bar, rod	SB-150	...	C63000	O20, O25, O30	>4	80

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	38.0	35.9	32.6	29.7	...	...	...	...	...	...	...	...	...	...
2	38.0	35.9	32.6	29.7	...	...	...	...	...	...	...	...	...	...
3	45.0	45.0	41.7	38.6	...	...	...	...	...	...	...	...	...	...
4	45.0	45.0	41.7	38.6	...	...	...	...	...	...	...	...	...	...
5	40.0	40.0	40.0	39.6	36.4	...	...	...	...	...	...	...	...	...
6	40.0	40.0	40.0	39.6	36.4	...	...	...	...	...	...	...	...	...
7	40.0	40.0	40.0	39.6	36.4	...	...	...	...	...	...	...	...	...
8	40.0	40.0	40.0	39.6	36.4	...	...	...	...	...	...	...	...	...
9	40.0	40.0	40.0	39.6	36.4	...	...	...	...	...	...	...	...	...
10	50.0	50.0	50.0	48.9	...	...	...	...	...	...	...	...	...	...
11	40.0	40.0	40.0	39.1	...	...	...	...	...	...	...	...	...	...
12	45.0	45.0	45.0	44.0	...	...	...	...	...	...	...	...	...	...
13	50.0	50.0	50.0	48.9	...	...	...	...	...	...	...	...	...	...
14	46.0	45.2	42.5	36.8	29.1	...	...	...	...	...	...	...	...	...
15	50.0	49.1	46.2	40.0	31.7	...	...	...	...	...	...	...	...	...
16	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
17	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
18	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
19	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
20	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
21	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
22	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
23	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
24	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
25	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
26	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
27	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
28	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
29	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
30	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
31	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
32	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
33	45.0	44.8	43.8	42.1	...	...	...	...	...	...	...	...	...	...
34	50.0	50.0	50.0	47.7	43.4	...	...	...	...	...	...	...	...	...
35	50.0	50.0	50.0	47.7	43.4	...	...	...	...	...	...	...	...	...
36	50.0	50.0	50.0	47.3	38.5	...	...	...	...	...	...	...	...	...
37	50.0	50.0	50.0	47.3	38.5	...	...	...	...	...	...	...	...	...
38	65.0	65.0	65.0	63.7	59.4	...	...	...	...	...	...	...	...	...
39	65.0	65.0	65.0	63.7	59.4	...	...	...	...	...	...	...	...	...
40	70.0	70.0	70.0	68.6	63.9	...	...	...	...	...	...	...	...	...
41	70.0	70.0	70.0	68.6	63.9	...	...	...	...	...	...	...	...	...
42	72.0	72.0	72.0	70.6	65.8	...	...	...	...	...	...	...	...	...
43	80.0	80.0	80.0	80.0	80.0	70.1	60.5	48.8	...	...	...	...	...	...
44	80.0	80.0	80.0	80.0	80.0	70.1	60.5	48.8	...	...	...	...	...	...
45	80.0	80.0	80.0	80.0	80.0	70.1	60.5	48.8	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)
(23)

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Bar, rod	SB-150	...	C63000	HR50	>4	80
2	...	Plate	SB-171	...	C63000	M10, M20, O20, O25	$2 < t \leq 3.5$	85
3	...	Bar, rod	SB-150	...	C63000	HR50	$2 < t \leq 4$	85
4	...	Bar, rod	SB-150	...	C63000	M20, M30	$2 < t \leq 4$	85
5	...	Bar, rod	SB-150	...	C63000	O20, O25, O30	$2 < t \leq 4$	85
6	...	Plate	SB-171	...	C63000	O25 or M20	≤ 2	90
7	...	Bar, rod	SB-150	...	C63000	HR50	$1 < t \leq 2$	90
8	...	Bar, rod	SB-150	...	C63000	HR50	$\frac{1}{2} < t \leq 1$	100
9	...	Forgings	SB-283	...	C64200	M10	$>1\frac{1}{2}$	68
10	...	Forgings	SB-283	...	C64200	M10	$\leq 1\frac{1}{2}$	70
11	...	Bar, rod	SB-150	...	C64200	M10, M20, M30	>4	70
12	...	Bar, rod	SB-150	...	C64200	M10, M20, M30	$3 < t \leq 4$	70
13	...	Bar, rod	SB-150	...	C64200	HR50	$2 < t \leq 3$	75
14	...	Bar, rod	SB-150	...	C64200	HR50	$1 < t \leq 2$	80
15	...	Bar, rod	SB-150	...	C64200	HR50	$\frac{1}{2} < t \leq 1$	85
16	...	Bar, rod	SB-150	...	C64200	HR50	$\leq \frac{1}{2}$	90
17	...	Bar, rod	SB-98	...	C65100	O60	All	40
18	...	Bar, rod	SB-98	...	C65100	H02	≤ 2	55
19	...	Rod	SB-98	...	C65100	H06	$\frac{1}{2} < t \leq 1\frac{1}{2}$	75
20	...	Rod	SB-98	...	C65100	H06	$t \leq \frac{1}{2}$	85
21	...	Plate, sheet	SB-96	...	C65500	O61	≤ 2	50
22	...	Smls. pipe & tube	SB-315	...	C65500	O61	...	50
23	...	Bar, rod	SB-98	...	C65500	O60	All	52
24	...	Rod	SB-98	...	C65500	H01	All	55
25	...	Bar, rod	SB-98	...	C65500	H02	≤ 2	70
26	...	Rod	SB-98	...	C66100	O60	All	52
27	...	Rod	SB-98	...	C66100	H01	All	55
28	...	Rod	SB-98	...	C66100	H02	≤ 2	70
(23) 29	...	Smls. cond. tube	SB-111	...	C68700	O61	...	50
(23) 30	...	Smls. U-bend tube	SB-395	...	C68700	O61	...	50
(23) 31	...	Wld. cond. tube	SB-543	...	C68700	W061	...	50
(23) 32	...	Smls. cond. tube	SB-111	...	C70400	O61	...	38
(23) 33	...	Wld. tube	SB-543	...	C70400	W061	...	38
(23) 34	...	Smls. cond. tube	SB-111	...	C70400	H55	...	40
35	...	Smls. pipe & tube	SB-466	...	C70600	O60	...	38
36	...	Wld. pipe	SB-467	...	C70600	W061	$>4\frac{1}{2}$	38
37	...	Bar, rod	SB-151	...	C70600	O60	All	38
38	...	Plate, sheet	SB-171	...	C70600	M10, M20	≤ 5	40
39	...	Plate, sheet	SB-171	...	C70600	O20, O25	≤ 5	40
40	...	Smls. cond. tube	SB-111	...	C70600	O61	...	40
41	...	Finned tube	SB-359	...	C70600	O61	...	40
42	...	Smls. U-bend tube	SB-395	...	C70600	O61	...	40
43	...	Wld. pipe	SB-467	...	C70600	W061	$\leq 4\frac{1}{2}$	40
44	...	Wld. tube	SB-543	...	C70600	W061	...	40
45	...	Finned wld. tube	SB-956	...	C70600	W061	...	40

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	80.0	80.0	80.0	80.0	80.0	70.1	60.5	48.8	...	...	...	...	...	...
2	85.0	85.0	85.0	85.0	85.0	74.5	64.3	51.9	...	...	...	...	...	...
3	85.0	85.0	85.0	85.0	85.0	74.5	64.3	51.9	...	...	...	...	...	...
4	85.0	85.0	85.0	85.0	85.0	74.5	64.3	51.9	...	...	...	...	...	...
5	85.0	85.0	85.0	85.0	85.0	74.5	64.3	51.9	...	...	...	...	...	...
6	90.0	90.0	90.0	90.0	90.0	78.9	68.1	54.9	...	...	...	...	...	...
7	90.0	90.0	90.0	90.0	90.0	78.9	68.1	54.9	...	...	...	...	...	...
8	100.0	100.0	100.0	100.0	100.0	87.6	75.6	61.0	...	...	...	...	...	...
9	68.0	68.0	68.0	68.0	68.0	...	...	...	...	...	...	...	...	...
10	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...	...
11	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...	...
12	70.0	70.0	70.0	70.0	70.0	...	...	...	...	...	...	...	...	...
13	75.0	75.0	75.0	75.0	75.0	...	...	...	...	...	...	...	...	...
14	80.0	80.0	80.0	80.0	80.0	...	...	...	...	...	...	...	...	...
15	85.0	85.0	85.0	85.0	85.0	...	...	...	...	...	...	...	...	...
16	90.0	90.0	90.0	90.0	90.0	...	...	...	...	...	...	...	...	...
17	40.0	40.0	40.0	40.0	36.8	...	...	...	...	...	...	...	...	...
18	55.0	55.0	55.0	52.1	45.0	...	...	...	...	...	...	...	...	...
19	75.0	75.0	75.0	71.1	66.0	...	...	...	...	...	...	...	...	...
20	85.0	85.0	85.0	80.6	74.8	...	...	...	...	...	...	...	...	...
21	50.0	50.0	50.0	47.5	42.9	...	...	...	...	...	...	...	...	...
22	50.0	50.0	50.0	47.5	42.9	...	...	...	...	...	...	...	...	...
23	52.0	52.0	52.0	49.4	44.6	...	...	...	...	...	...	...	...	...
24	55.0	55.0	55.0	54.9	50.2	...	...	...	...	...	...	...	...	...
25	70.0	70.0	70.0	70.0	67.1	...	...	...	...	...	...	...	...	...
26	52.0	52.0	52.0	49.4	44.6	...	...	...	...	...	...	...	...	...
27	55.0	55.0	55.0	54.9	50.2	...	...	...	...	...	...	...	...	...
28	70.0	70.0	70.0	70.0	67.1	...	...	...	...	...	...	...	...	...
29	50.0	50.0	50.0	50.0	49.7	46.8	...	...	...	...	...	...	...	...
30	50.0	50.0	50.0	50.0	49.7	46.8	...	...	...	...	...	...	...	...
31	50.0	50.0	50.0	50.0	49.7	46.8	...	...	...	...	...	...	...	...
32	38.0	38.0	36.7	34.9	33.7	32.9	...	...	...	...	...	...	...	...
33	38.0	38.0	36.7	34.9	33.7	32.9	...	...	...	...	...	...	...	...
34	40.0	40.0	38.6	36.8	35.5	34.7	...	...	...	...	...	...	...	...
35	38.0	37.6	34.7	32.6	31.4	30.9	...	...	...	...	...	...	...	...
36	38.0	37.6	34.7	32.6	31.4	30.9	...	...	...	...	...	...	...	...
37	38.0	37.6	34.7	32.6	31.4	30.9	...	...	...	...	...	...	...	...
38	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
39	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
40	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
41	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
42	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
43	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
44	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
45	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	(23)
31	...	...	...	...	...	...	...	...	...	...	...	...	(23)
32	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	(23)
34	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Wld. pipe	SB-467	...	C70600	WM50	$\leq 4\frac{1}{2}$	45
2	...	Smls. tube	SB-111	...	C70600	H55	...	45
3	...	Smls. pipe & tube	SB-466	...	C70600	H55	...	45
4	...	Wld. tube	SB-543	...	C70600	WC55	...	45
5	...	Finned wld. tube	SB-956	...	C70600	WC55	...	45
6	...	Wld. pipe	SB-467	...	C70600	Wld. fr. cold rld. strip	$\leq 4\frac{1}{2}$	54
7	...	Smls. pipe & tube	SB-466	...	C70620	O60	...	38
8	...	Wld. pipe	SB-467	...	C70620	W061	$> 4\frac{1}{2}$	38
9	...	Bar, rod	SB-151	...	C70620	O60	All	38
10	...	Forgings	SB-283	...	C70620	M10	> 6	40
11	...	Plate, sheet	SB-171	...	C70620	M20	≤ 5	40
12	...	Forgings	SB-283	...	C70620	O20	...	40
13	...	Plate, sheet	SB-171	...	C70620	O25	≤ 5	40
14	...	Smls. cond. tube	SB-111	...	C70620	O61	...	40
15	...	Finned tube	SB-359	...	C70620	O61	...	40
16	...	Smls. U-bend tube	SB-395	...	C70620	O61	...	40
17	...	Wld. pipe	SB-467	...	C70620	W061	$\leq 4\frac{1}{2}$	40
18	...	Wld. tube	SB-543	...	C70620	W061	...	40
19	...	Finned wld. tube	SB-956	...	C70620	W061	...	40
20	...	Forgings	SB-283	...	C70620	M10	≤ 6	45
21	...	Wld. pipe	SB-467	...	C70620	W061	$\leq 4\frac{1}{2}$	45
22	...	Smls. tube	SB-111	...	C70620	H55	...	45
23	...	Smls. pipe & tube	SB-466	...	C70620	H55	...	45
24	...	Wld. tube	SB-543	...	C70620	WC55	...	45
25	...	Finned wld. tube	SB-956	...	C70620	WC55	...	45
26	...	Wld. pipe	SB-467	...	C70620	Wld. fr. cold rld. strip	$\leq 4\frac{1}{2}$	54
(23) 27	...	Smls. tube	SB-466	...	C71000	O60	...	45
(23) 28	...	Smls. cond. tube	SB-111	...	C71000	O61	...	45
(23) 29	...	Finned tube	SB-359	...	C71000	O61	...	45
(23) 30	...	Smls. tube	SB-395	...	C71000	O61	...	45
31	...	Wld. pipe	SB-467	...	C71500	W061	$> 4\frac{1}{2}$	45
32	...	Plate, sheet	SB-171	...	C71500	M10, M20, O20, O25	$2.5 < t \leq 5$	45
33	...	Plate, sheet	SB-171	...	C71500	M10, M20, O20, O25	≤ 2.5	50
34	...	Wld. pipe	SB-467	...	C71500	W061	$\leq 4\frac{1}{2}$	50
35	...	Smls. pipe & tube	SB-466	...	C71500	O60	...	52
36	...	Smls. cond. tube	SB-111	...	C71500	O61	...	52
37	...	Finned tube	SB-359	...	C71500	O61	...	52
38	...	Smls. U-bend tube	SB-395	...	C71500	O61	...	52
39	...	Wld. tube	SB-543	...	C71500	W061	...	52
40	...	Finned wld. tube	SB-956	...	C71500	W061	...	52
(23) 41	...	Smls. cond. tube	SB-111	...	C71500	HR50	...	72
(23) 42	...	Smls. U-bend tube	SB-395	...	C71500	HR50	...	72
43	...	Wld. pipe	SB-467	...	C71520	W061	$> 4\frac{1}{2}$	45
44	...	Forgings	SB-283	...	C71520	M10	> 6	45
45	...	Forgings	SB-283	...	C71520	O20	...	45

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)														
1	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
2	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
3	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
4	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
5	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
6	54.0	53.4	49.3	46.3	44.6	44.0	...	...	...	...	...	...	...	...
7	38.0	37.6	34.7	32.6	31.4	30.9	...	...	...	...	...	...	...	...
8	38.0	37.6	34.7	32.6	31.4	30.9	...	...	...	...	...	...	...	...
9	38.0	37.6	34.7	32.6	31.4	30.9	...	...	...	...	...	...	...	...
10	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
11	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
12	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
13	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
14	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
15	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
16	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
17	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
18	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
19	40.0	39.6	36.5	34.3	33.0	32.6	...	...	...	...	...	...	...	...
20	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
21	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
22	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
23	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
24	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
25	45.0	44.5	41.1	38.6	37.1	36.6	...	...	...	...	...	...	...	...
26	54.0	53.4	49.3	46.3	44.6	44.0	...	...	...	...	...	...	...	...
27	45.0	45.0	43.8	42.5	41.4	40.0	39.2	38.2	37.0	35.5	...	...	...	...
28	45.0	45.0	43.8	42.5	41.4	40.0	39.2	38.2	37.0	35.5	...	...	...	...
29	45.0	45.0	43.8	42.5	41.4	40.0	39.2	38.2	37.0	35.5	...	...	...	...
30	45.0	45.0	43.8	42.5	41.4	40.0	39.2	38.2	37.0	35.5	...	...	...	...
31	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	...	...	...	...	...	...
32	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	...	...	...	...	...	...
33	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	...	...	...	...	...	...
34	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	...	...	...	...	...	...
35	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
36	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
37	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
38	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
39	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
40	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
41	72.0	72.0	72.0	70.0	68.0	66.3	65.4	64.4	63.0	...	...	...	...	...
42	72.0	72.0	72.0	70.0	68.0	66.3	65.4	64.4	63.0	...	...	...	...	...
43	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	...	...	...	...	...	...
44	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	...	...	...	...	...	...
45	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	(23)
29	...	...	...	...	...	...	...	...	...	...	...	...	(23)
30	...	...	...	...	...	...	...	...	...	...	...	...	(23)
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	(23)
42	...	...	...	...	...	...	...	...	...	...	...	...	(23)
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	...	Plate, sheet	SB-171	...	C71520	O25	$2.5 < t \leq 5$	45
2	...	Forgings	SB-283	...	C71520	M10	≤ 6	50
3	...	Plate, sheet	SB-171	...	C71520	O25	≤ 2.5	50
4	...	Wld. pipe	SB-467	...	C71520	W061	$\leq 4\frac{1}{2}$	50
5	...	Smls. pipe & tube	SB-466	...	C71520	O60	...	52
6	...	Smls. cond. tube	SB-111	...	C71520	O61	...	52
7	...	Finned tube	SB-359	...	C71520	O61	...	52
(23) 8	...	Smls. pipe & tube	SB-395	...	C71520	O61	...	52
9	...	Wld. tube	SB-543	...	C71520	W061	...	52
10	...	Finned wld. tube	SB-956	...	C71520	W061	...	52
(23) 11	...	Smls. cond. tube	SB-111	...	C71520	HR50	...	72
(23) 12	...	Smls. U-bend tube	SB-395	...	C71520	HR50	...	72
(23) 13	...	Smls. cond. tube	SB-111	...	C72200	O61	...	45
14	...	Castings	SB-62	...	C83600	M01	...	30
15	...	Castings	SB-61	...	C92200	M01	...	34
16	...	Castings	SB-584	...	C92200	M01	...	34
17	...	Castings	SB-584	...	C93700	M01	...	30
18	...	Castings	SB-148	...	C95200	M01	...	65
19	...	Castings	SB-271	...	C95200	M02	...	65
20	...	Castings	SB-505	...	C95200	M07	...	68
21	...	Castings	SB-148	...	C95400	M01	...	75
22	...	Castings	SB-271	...	C95400	M02	...	75
23	...	Castings	SB-148	...	C95800	M01	...	85
24	...	Castings	SB-148	...	C95820	M01	...	94
25	...	Castings	SB-369	...	C96200	M01	...	45
26	...	Castings	SB-584	...	C97600	M01	...	40
27	99Ni	Plate, sheet, strip	SB-162	...	N02200	As rolled	...	55
28	99Ni	Smls. pipe & tube	SB-161	...	N02200	Stress rel.	...	65
29	99Ni	Smls. tube	SB-163	...	N02200	Stress rel.	...	65
30	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed	>5 O.D.	50
31	99Ni-Low C	Smls. & wld. ftgs.	SB-366	...	N02201	Annealed	...	50
32	99Ni-Low C	Bar, rod	SB-160	...	N02201	Hot rolled/ann.	...	50
33	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed	≤ 5 O.D.	50
34	99Ni-Low C	Smls. tube	SB-163	...	N02201	Annealed	...	50
35	99Ni-Low C	Plate, sheet, strip	SB-162	...	N02201	Hot rolled/ann.	...	50
36	67Ni-30Cu	Bar	SB-164	...	N04400	Annealed	...	70
37	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed	>5 O.D.	70
38	67Ni-30Cu	Forgings	SB-564	...	N04400	Annealed	...	70
39	67Ni-30Cu	Plate	SB-127	...	N04400	Annealed	...	70
40	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Annealed	≤ 3	70
41	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed	≤ 5 O.D.	70
42	67Ni-30Cu	Smls. & wld. ftgs.	SB-366	...	N04400	Annealed	...	70
43	67Ni-30Cu	Plate	SB-127	...	N04400	As rolled	...	75
44	67Ni-30Cu	Rounds	SB-164	...	N04400	Hot worked	$12 < t \leq 14$	75
45	67Ni-30Cu	Rounds	SB-164	...	N04400	Hot worked	$t \leq 12$	80

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)														
1	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	...	...	...	...	...	...
2	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	...	...	...	...	...	...
3	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	...	...	...	...	...	...
4	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	...	...	...	...	...	...
5	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
6	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
7	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
8	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
9	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
10	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	...	...	...	...	...	...
11	72.0	72.0	72.0	70.0	68.0	66.3	65.4	64.4	63.0	...	...	...	...	...
12	72.0	72.0	72.0	70.0	68.0	66.3	65.4	64.4	63.0	...	...	...	...	...
13	45.0	43.7	41.7	38.4	37.2	...	...	...	...	...	...	...	...	...
14	30.0	30.0	29.3	28.3	27.7	27.5	...	...	...	...	...	...	...	...
15	34.0	34.0	34.0	33.1	29.5	20.5	...	...	...	...	...	...	...	...
16	34.0	34.0	34.0	33.1	29.5	20.5	...	...	...	...	...	...	...	...
17	30.0	29.6	27.7	26.0	24.5	20.5	...	...	...	...	...	...	...	...
18	65.0	65.0	65.0	62.1	56.5	48.6	...	...	...	...	...	...	...	...
19	65.0	65.0	65.0	62.1	56.5	48.6	...	...	...	...	...	...	...	...
20	68.0	68.0	68.0	65.0	59.2	50.9	...	...	...	...	...	...	...	...
21	75.0	75.0	75.0	75.0	75.0	...	...	...	...	...	...	...	...	...
22	75.0	75.0	75.0	75.0	75.0	...	...	...	...	...	...	...	...	...
23	85.0	84.8	80.2	76.8	...	...	...	...	...	...	...	...	...	...
24	94.0	93.7	88.7	84.9	81.7	...	...	...	...	...	...	...	...	...
25	45.0	44.8	41.0	38.8	37.3	...	...	...	...	...	...	...	...	...
26	40.0	39.5	38.5	...	...	...	...	...	...	...	...	...	...	...
27	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	...	...	...
28	65.0	65.0	65.0	65.0	64.1	61.8	59.8	...	...	...	...	...	...	...
29	65.0	65.0	65.0	65.0	64.1	61.8	59.8	...	...	...	...	...	...	...
30	50.0	50.0	50.0	49.8	47.8	45.6	44.4	43.2	42.2	40.8	38.4	35.9	33.3	30.7
31	50.0	50.0	50.0	49.8	47.8	45.6	44.4	43.2	42.2	40.8	38.4	35.9	33.3	30.7
32	50.0	50.0	50.0	49.8	47.8	45.6	44.4	43.2	42.2	40.8	38.4	35.9	33.3	30.7
33	50.0	50.0	50.0	49.8	47.8	45.6	44.4	43.2	42.2	40.8	38.4	35.9	33.3	30.7
34	50.0	50.0	50.0	49.8	47.8	45.6	44.4	43.2	42.2	40.8	38.4	35.9	33.3	30.7
35	50.0	50.0	50.0	49.8	47.8	45.6	44.4	43.2	42.2	40.8	38.4	35.9	33.3	30.7
36	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
37	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
38	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
39	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
40	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
41	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
42	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
43	75.0	75.0	75.0	75.0	75.0	75.0	74.9	72.3	69.0	65.1	60.8	56.6	53.1	50.8
44	75.0	75.0	75.0	75.0	75.0	75.0	74.9	72.3	69.0	65.1	...	...	...	...
45	80.0	80.0	80.0	80.0	79.9	78.7	77.3	75.3	72.4	68.6	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	28.3	26.0	24.1	22.7	...	...	...	...	...	...	...	...	...
31	28.3	26.0	24.1	22.7	...	...	...	...	...	...	...	...	...
32	28.3	26.0	24.1	22.7	...	...	...	...	...	...	...	...	...
33	28.3	26.0	24.1	22.7	...	...	...	...	...	...	...	...	...
34	28.3	26.0	24.1	22.7	...	...	...	...	...	...	...	...	...
35	28.3	26.0	24.1	22.7	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	67Ni-30Cu	Rounds	SB-164	...	N04400	CW & SR	$t < \frac{1}{2}$	84
2	67Ni-30Cu	Rounds	SB-164	...	N04400	CW & SR	$3\frac{1}{2} < t \leq 4$	84
3	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Stress rel.	...	85
4	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Stress rel.	...	85
5	67Ni-30Cu	Rounds	SB-164	...	N04400	CW & SR	$\frac{1}{2} \leq t \leq 3\frac{1}{2}$	87
6	67Ni-30Cu	Rounds	SB-164	...	N04400	Cold worked	$t < \frac{1}{2}$	110
7	67Ni-30Cu-S	Bar	SB-164	...	N04405	Annealed	...	70
8	67Ni-30Cu-S	Bar	SB-164	...	N04405	Hot worked	...	75
9	67Ni-28Cu-3Al	Bolting	SF-468	...	N05500	Ann./aged	0.250-1.500	130
10	47Ni-22Cr-9Mo-18Fe	Plate	SB-435	...	N06002	Annealed	$> \frac{3}{16}$	95
11	47Ni-22Cr-9Mo-18Fe	Sheet	SB-435	...	N06002	Solution ann.	$\leq \frac{3}{16}$	95
12	47Ni-22Cr-9Mo-18Fe	Rod	SB-572	...	N06002	Annealed	...	95
13	47Ni-22Cr-9Mo-18Fe	Smls. & wld. ftgs.	SB-366	...	N06002	Annealed	...	100
14	47Ni-22Cr-9Mo-18Fe	Sheet	SB-435	...	N06002	Annealed	$\frac{1}{16} < t \leq \frac{3}{16}$	100
15	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.	...	100
16	47Ni-22Cr-9Mo-18Fe	Smls. pipe & tube	SB-622	...	N06002	Solution ann.	...	100
17	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.	...	100
18	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.	$> \frac{3}{4}$	85
19	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.	$> \frac{3}{4}$	85
20	47Ni-22Cr-19Fe-6Mo	Smls. & wld. ftgs.	SB-366	...	N06007	Annealed	...	90
21	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.	$\leq \frac{3}{4}$	90
22	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.	$\leq \frac{3}{4}$	90
23	47Ni-22Cr-19Fe-6Mo	Wld. pipe	SB-619	...	N06007	Solution ann.	...	90
24	47Ni-22Cr-19Fe-6Mo	Smls. pipe & tube	SB-622	...	N06007	Solution ann.	...	90
25	47Ni-22Cr-19Fe-6Mo	Wld. tube	SB-626	...	N06007	Solution ann.	...	90
26	55Ni-21Cr-13.5Mo	Smls. & wld. ftgs.	SB-366	...	N06022	Solution ann.	...	100
27	55Ni-21Cr-13.5Mo	Forgings	SB-462	...	N06022	Solution ann.	...	100
28	55Ni-21Cr-13.5Mo	Forgings	SB-564	...	N06022	Solution ann.	...	100
29	55Ni-21Cr-13.5Mo	Rod	SB-574	...	N06022	Solution ann.	...	100
30	55Ni-21Cr-13.5Mo	Plate, sheet, strip	SB-575	...	N06022	Solution ann.	...	100
31	55Ni-21Cr-13.5Mo	Wld. pipe	SB-619	...	N06022	Solution ann.	...	100
32	55Ni-21Cr-13.5Mo	Smls. pipe & tube	SB-622	...	N06022	Solution ann.	...	100
33	55Ni-21Cr-13.5Mo	Wld. tube	SB-626	...	N06022	Solution ann.	...	100
34	60Ni-25Cr-9.5Fe-2.1Al	Smls. tube	SB-163	...	N06025	Annealed	...	98
35	60Ni-25Cr-9.5Fe-2.1Al	Plate, sheet, strip	SB-168	...	N06025	Annealed	...	98
36	60Ni-25Cr-9.5Fe-2.1Al	Wrought fittings	SB-366	...	N06025	Annealed	...	98
37	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-462	...	N06025	Annealed	$t \leq 4$	98
38	60Ni-25Cr-9.5Fe-2.1Al	Wld. tube	SB-516	...	N06025	Annealed	...	98
39	60Ni-25Cr-9.5Fe-2.1Al	Wld. pipe	SB-517	...	N06025	Annealed	...	98
40	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-564	...	N06025	Annealed	$t \leq 4$	98
41	60Ni-25Cr-9.5Fe-2.1Al	Bar	SB-166	...	N06025	HW or CW ann.	$t \leq 4$	98
42	60Ni-25Cr-9.5Fe-2.1Al	Smls. pipe & tube	SB-167	...	N06025	HW or CW ann.	...	98
43	40Ni-29Cr-15Fe-5Mo	Smls. & wld. ftgs.	SB-366	...	N06030	Solution ann.	...	85
44	40Ni-29Cr-15Fe-5Mo	Forgings	SB-462	...	N06030	Solution ann.	...	85
45	40Ni-29Cr-15Fe-5Mo	Rod	SB-581	...	N06030	Solution ann.	...	85

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	84.0	84.0	84.0	84.0	83.9	82.6	81.2	79.0	76.0	72.0	...	...	...	...
2	84.0	84.0	84.0	84.0	83.9	82.6	81.2	79.0	76.0	72.0	...	...	...	...
3	85.0	85.0	85.0	84.9	84.9	83.7	82.2	79.9	76.8	72.9	68.6	64.2	60.2	57.5
4	85.0	85.0	85.0	84.9	84.9	83.7	82.2	79.9	76.8	72.9	68.6	64.2	60.2	57.5
5	87.0	87.0	87.0	87.0	86.9	85.6	84.1	81.9	78.7	74.6	...	...	...	...
6	110.0	110.0	110.0	110.0	109.9	108.2	106.3	103.5	99.6	94.3	...	...	...	...
7	70.0	70.0	70.0	70.0	70.0	70.0	70.0	69.7	67.3	64.1	60.3	56.4	52.9	50.5
8	75.0	75.0	75.0	75.0	75.0	75.0	74.9	72.3	69.0	65.1	60.8	56.6	53.1	50.8
9	130.0	130.0	130.0	130.0	130.0	129.7	128.1	126.3	...	...	...	...	...	...
10	95.0	95.0	93.8	91.4	89.0	86.4	85.1	83.7	82.5	81.3	80.2	79.3	78.6	78.1
11	95.0	95.0	93.8	91.4	89.0	86.4	85.1	83.7	82.5	81.3	80.2	79.3	78.6	78.1
12	95.0	95.0	93.8	91.4	89.0	86.4	85.1	83.7	82.5	81.3	80.2	79.3	78.6	78.1
13	100.0	100.0	98.8	96.3	93.7	91.0	89.6	88.2	86.8	85.6	84.5	83.5	82.8	82.2
14	100.0	100.0	98.8	96.3	93.7	91.0	89.6	88.2	86.8	85.6	84.5	83.5	82.8	82.2
15	100.0	100.0	98.8	96.3	93.7	91.0	89.6	88.2	86.8	85.6	84.5	83.5	82.8	82.2
16	100.0	100.0	98.8	96.3	93.7	91.0	89.6	88.2	86.8	85.6	84.5	83.5	82.8	82.2
17	100.0	100.0	98.8	96.3	93.7	91.0	89.6	88.2	86.8	85.6	84.5	83.5	82.8	82.2
18	85.0	85.0	83.7	82.7	81.4	79.8	79.0	78.3	77.7	77.2	76.5	75.7	74.1	71.5
19	85.0	85.0	83.7	82.7	81.4	79.8	79.0	78.3	77.7	77.2	76.5	75.7	74.1	71.5
20	90.0	90.0	88.6	87.6	86.2	84.5	83.7	82.9	82.3	81.7	81.1	80.1	78.5	75.7
21	90.0	90.0	88.6	87.6	86.2	84.5	83.7	82.9	82.3	81.7	81.1	80.1	78.5	75.7
22	90.0	90.0	88.6	87.6	86.2	84.5	83.7	82.9	82.3	81.7	81.1	80.1	78.5	75.7
23	90.0	90.0	88.6	87.6	86.2	84.5	83.7	82.9	82.3	81.7	81.1	80.1	78.5	75.7
24	90.0	90.0	88.6	87.6	86.2	84.5	83.7	82.9	82.3	81.7	81.1	80.1	78.5	75.7
25	90.0	90.0	88.6	87.6	86.2	84.5	83.7	82.9	82.3	81.7	81.1	80.1	78.5	75.7
26	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
27	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
28	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
29	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
30	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
31	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
32	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
33	100.0	100.0	98.5	95.3	92.9	91.1	90.4	89.7	89.1	88.4	87.8	87.1	86.3	85.4
34	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
35	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
36	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
37	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
38	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
39	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
40	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
41	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
42	98.0	98.0	98.0	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.3	96.0	94.3	92.1
43	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5
44	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5
45	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	75.1	73.1	70.6	67.7	64.3	60.4	56.1	51.4	46.3	41.1	35.8	30.6	25.6
11	75.1	73.1	70.6	67.7	64.3	60.4	56.1	51.4	46.3	41.1	35.8	30.6	25.6
12	75.1	73.1	70.6	67.7	64.3	60.4	56.1	51.4	46.3	41.1	35.8	30.6	25.6
13	79.0	76.9	74.3	71.2	67.6	63.6	59.0	54.1	48.8	43.3	37.7	32.2	27.0
14	79.0	76.9	74.3	71.2	67.6	63.6	59.0	54.1	48.8	43.3	37.7	32.2	27.0
15	79.0	76.9	74.3	71.2	67.6	63.6	59.0	54.1	48.8	43.3	37.7	32.2	27.0
16	79.0	76.9	74.3	71.2	67.6	63.6	59.0	54.1	48.8	43.3	37.7	32.2	27.0
17	79.0	76.9	74.3	71.2	67.6	63.6	59.0	54.1	48.8	43.3	37.7	32.2	27.0
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26	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
27	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
28	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
29	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
30	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
31	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
32	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
33	83.4	82.3	81.1	79.7	78.2	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	40Ni-29Cr-15Fe-5Mo	Plate, sheet, strip	SB-582	...	N06030	Solution ann.	...	85
2	40Ni-29Cr-15Fe-5Mo	Wld. pipe	SB-619	...	N06030	Solution ann.	...	85
3	40Ni-29Cr-15Fe-5Mo	Smls. pipe & tube	SB-622	...	N06030	Solution ann.	...	85
4	40Ni-29Cr-15Fe-5Mo	Wld. tube	SB-626	...	N06030	Solution ann.	...	85
5	58Ni-33Cr-8Mo	Smls. & wld. ftgs.	SB-366	...	N06035	Solution ann.	...	85
6	58Ni-33Cr-8Mo	Forgings	SB-462	...	N06035	Solution ann.	...	85
7	58Ni-33Cr-8Mo	Forgings	SB-564	...	N06035	Solution ann.	...	85
8	58Ni-33Cr-8Mo	Rod	SB-574	...	N06035	Solution ann.	...	85
9	58Ni-33Cr-8Mo	Plate, sheet, strip	SB-575	...	N06035	Solution ann.	...	85
10	58Ni-33Cr-8Mo	Wld. pipe	SB-619	...	N06035	Solution ann.	...	85
11	58Ni-33Cr-8Mo	Smls. pipe & tube	SB-622	...	N06035	Solution ann.	...	85
12	58Ni-33Cr-8Mo	Wld. tube	SB-626	...	N06035	Solution ann.	...	85
13	46Ni-27Cr-23Fe-2.75Si	Rod	SB-166	...	N06045	...	...	90
14	46Ni-27Cr-23Fe-2.75Si	Smls. pipe & tube	SB-167	...	N06045	...	...	90
15	46Ni-27Cr-23Fe-2.75Si	Plate, sheet, strip	SB-168	...	N06045	...	...	90
16	46Ni-27Cr-23Fe-2.75Si	Smls. & wld. ftgs.	SB-366	...	N06045	...	...	90
17	46Ni-27Cr-23Fe-2.75Si	Wld. tube	SB-516	...	N06045	...	...	90
18	46Ni-27Cr-23Fe-2.75Si	Wld. pipe	SB-517	...	N06045	...	...	90
19	46Ni-27Cr-23Fe-2.75Si	Forgings	SB-564	...	N06045	...	...	90
20	59Ni-23Cr-16Mo	Fittings	SB-366	CR5923	N06059	Annealed	...	100
21	59Ni-23Cr-16Mo	Fittings	SB-366	WP5923	N06059	Annealed	...	100
22	59Ni-23Cr-16Mo	Wld. fittings	SB-366	WP5923W	N06059	Annealed	...	100
23	59Ni-23Cr-16Mo	Fittings	SB-366	WP5923WX	N06059	Annealed	...	100
24	59Ni-23Cr-16Mo	Forged fittings	SB-462	...	N06059	Solution ann.	...	100
25	59Ni-23Cr-16Mo	Forgings	SB-564	...	N06059	Solution ann.	...	100
26	59Ni-23Cr-16Mo	Rod	SB-574	...	N06059	Solution ann.	...	100
27	59Ni-23Cr-16Mo	Plate, sheet, strip	SB-575	...	N06059	Solution ann.	...	100
28	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.	...	100
29	59Ni-23Cr-16Mo	Smls. pipe & tube	SB-622	...	N06059	Solution ann.	...	100
30	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.	...	100
31	59Ni-23Cr-16Mo-1.6Cu	Fittings	SB-366	...	N06200	Solution ann.	...	100
32	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-462	...	N06200	Solution ann.	...	100
33	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-564	...	N06200	Solution ann.	...	100
34	59Ni-23Cr-16Mo-1.6Cu	Rod	SB-574	...	N06200	Solution ann.	...	100
35	59Ni-23Cr-16Mo-1.6Cu	Plate, sheet, strip	SB-575	...	N06200	Solution ann.	...	100
36	59Ni-23Cr-16Mo-1.6Cu	Wld. pipe	SB-619	...	N06200	Solution ann.	...	100
37	59Ni-23Cr-16Mo-1.6Cu	Smls. pipe & tube	SB-622	...	N06200	Solution ann.	...	100
38	59Ni-23Cr-16Mo-1.6Cu	Wld. tube	SB-626	...	N06200	Solution ann.	...	100
39	60Ni-19Cr-19Mo-1.8Ta	Smls. & wld. ftgs.	SB-366	...	N06210	Solution ann.	...	100
40	60Ni-19Cr-19Mo-1.8Ta	Forgings	SB-564	...	N06210	Solution ann.	...	100
41	60Ni-19Cr-19Mo-1.8Ta	Rod	SB-574	...	N06210	Solution ann.	...	100
42	60Ni-19Cr-19Mo-1.8Ta	Plate, sheet, strip	SB-575	...	N06210	Solution ann.	...	100
43	60Ni-19Cr-19Mo-1.8Ta	Wld. pipe	SB-619	...	N06210	Solution ann.	...	100
44	60Ni-19Cr-19Mo-1.8Ta	Smls. pipe & tube	SB-622	...	N06210	Solution ann.	...	100
45	60Ni-19Cr-19Mo-1.8Ta	Wld. tube	SB-626	...	N06210	Solution ann.	...	100

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5
2	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5
3	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5
4	85.0	85.0	81.5	78.8	76.7	75.0	74.3	73.6	73.0	72.4	71.7	70.9	69.9	68.5
5	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
6	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
7	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
8	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
9	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
10	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
11	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
12	85.0	85.0	83.7	79.6	76.7	74.8	74.0	73.3	72.6	71.8	70.9	69.8	68.6	67.2
13	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
14	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
15	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
16	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
17	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
18	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
19	90.0	90.0	87.1	82.3	79.1	77.2	76.6	76.0	75.4	74.8	74.0	72.9	71.6	70.1
20	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
21	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
22	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
23	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
24	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
25	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
26	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
27	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
28	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
29	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
30	100.0	100.0	100.0	97.9	94.4	91.2	89.7	88.3	87.1	86.1	85.3	84.7	84.2	83.8
31	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
32	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
33	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
34	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
35	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
36	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
37	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
38	100.0	100.0	100.0	96.7	93.7	91.7	91.0	90.2	89.3	88.3	87.2	86.0	84.9	84.1
39	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3
40	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3
41	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3
42	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3
43	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3
44	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3
45	100.0	100.0	99.8	96.7	94.2	92.2	91.4	90.7	90.0	89.4	88.9	88.4	87.8	87.3

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	57Ni-22Cr-14W-2Mo-La	Plate, sheet, strip	SB-435	...	N06230	Solution ann.	...	110
2	57Ni-22Cr-14W-2Mo-La	Forgings	SB-564	...	N06230	Solution ann.	...	110
3	57Ni-22Cr-14W-2Mo-La	Bar	SB-572	...	N06230	Solution ann.	...	110
4	57Ni-22Cr-14W-2Mo-La	Wld. pipe	SB-619	...	N06230	Solution ann.	...	110
5	57Ni-22Cr-14W-2Mo-La	Smls. pipe & tube	SB-622	...	N06230	Solution ann.	...	110
6	57Ni-22Cr-14W-2Mo-La	Wld. tube	SB-626	...	N06230	Solution ann.	...	110
7	61Ni-16Mo-16Cr	Smls. & wld. ftgs.	SB-366	...	N06455	Annealed	...	100
8	61Ni-16Mo-16Cr	Rod	SB-574	...	N06455	Solution ann.	...	100
9	61Ni-16Mo-16Cr	Plate, sheet, strip	SB-575	...	N06455	Solution ann.	...	100
10	61Ni-16Mo-16Cr	Wld. pipe	SB-619	...	N06455	Solution ann.	...	100
11	61Ni-16Mo-16Cr	Smls. pipe & tube	SB-622	...	N06455	Solution ann.	...	100
12	61Ni-16Mo-16Cr	Wld. tube	SB-626	...	N06455	Solution ann.	...	100
(23) 13	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.	>5	75
(23) 14	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.	>5	80
(23) 15	72Ni-15Cr-8Fe	Smls. & wld. ftgs.	SB-366	...	N06600	Annealed	...	80
(23) 16	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.	>5	80
(23) 17	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.	≤5	80
(23) 18	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed	≤3	80
(23) 19	72Ni-15Cr-8Fe	Bar	SB-166	...	N06600	Annealed	...	80
(23) 20	72Ni-15Cr-8Fe	Plate	SB-168	...	N06600	Annealed	...	80
(23) 21	72Ni-15Cr-8Fe	Wld. tube	SB-516	...	N06600	Annealed	...	80
(23) 22	72Ni-15Cr-8Fe	Forgings	SB-564	...	N06600	...	...	80
(23) 23	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.	≤5	80
(23) 24	72Ni-15Cr-8Fe	Wld. pipe	SB-517	...	N06600	Cold drawn/ann.	...	80
(23) 25	72Ni-15Cr-8Fe	Bar, rod	SB-166	...	N06600	Hot fin.	...	85
(23) 26	72Ni-15Cr-8Fe	Plate, sheet, strip	SB-168	...	N06600	Hot rolled	...	85
(23) 27	72Ni-15Cr-8Fe	Rounds	SB-166	...	N06600	Hot worked	$t > 3$	85
28	72Ni-15Cr-8Fe	Rounds	SB-166	...	N06600	Hot worked	$\frac{1}{2} < t \leq 3$	90
29	72Ni-15Cr-8Fe	Rounds	SB-166	...	N06600	Hot worked	$\frac{1}{4} \leq t \leq \frac{1}{2}$	95
30	60Ni-23Cr-Fe	Smls. tube	SB-163	...	N06601	Annealed	≤3 O.D.	80
31	60Ni-23Cr-Fe	Bar	SB-166	...	N06601	Annealed	...	80
32	60Ni-23Cr-Fe	Smls. pipe & tube	SB-167	...	N06601	Annealed	...	80
33	60Ni-23Cr-Fe	Plate, sheet, strip	SB-168	...	N06601	Annealed	...	80
34	52Ni-22Cr-13Co-9Mo	Bar, rod	SB-166	...	N06617	Annealed	...	95
35	52Ni-22Cr-13Co-9Mo	Smls. pipe & tube	SB-167	...	N06617	Annealed	...	95
36	52Ni-22Cr-13Co-9Mo	Plate, sheet, strip	SB-168	...	N06617	Annealed	...	95
37	52Ni-22Cr-13Co-9Mo	Forgings	SB-564	...	N06617	Annealed	...	95
(23) 38	52Ni-22Cr-13Co-9Mo	Wld. tube	SB-626	...	N06617	Solution ann.	...	95
(23) 39	60Ni-22Cr-9Mo-3.5Cb	Plate, sheet, strip	SB-443	2	N06625	Solution ann.	...	100
(23) 40	60Ni-22Cr-9Mo-3.5Cb	Smls. pipe & tube	SB-444	2	N06625	Solution ann.	...	100
(23) 41	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	2	N06625	Solution ann.	...	100
42	60Ni-22Cr-9Mo-3.5Cb	Smls. & wld. ftgs.	SB-366	...	N06625	Annealed	...	110
43	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	1	N06625	Annealed	$4 < t \leq 10$	110
44	60Ni-22Cr-9Mo-3.5Cb	Forgings	SB-564	...	N06625	Annealed	$4 < t \leq 10$	110
(23) 45	60Ni-22Cr-9Mo-3.5Cb	Plate	SB-443	1	N06625	Cold rolled/ann.	≤0.375	110

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	110.0	110.0	110.0	107.7	104.8	102.9	102.3	101.9	101.5	101.3	101.0	100.7	100.4	99.8
2	110.0	110.0	110.0	107.7	104.8	102.9	102.3	101.9	101.5	101.3	101.0	100.7	100.4	99.8
3	110.0	110.0	110.0	107.7	104.8	102.9	102.3	101.9	101.5	101.3	101.0	100.7	100.4	99.8
4	110.0	110.0	110.0	107.7	104.8	102.9	102.3	101.9	101.5	101.3	101.0	100.7	100.4	99.8
5	110.0	110.0	110.0	107.7	104.8	102.9	102.3	101.9	101.5	101.3	101.0	100.7	100.4	99.8
6	110.0	110.0	110.0	107.7	104.8	102.9	102.3	101.9	101.5	101.3	101.0	100.7	100.4	99.8
7	100.0	100.0	100.0	100.0	98.9	97.7	97.1	96.3	95.4	94.5	93.5	92.6	92.0	92.0
8	100.0	100.0	100.0	100.0	98.9	97.7	97.1	96.3	95.4	94.5	93.5	92.6	92.0	92.0
9	100.0	100.0	100.0	100.0	98.9	97.7	97.1	96.3	95.4	94.5	93.5	92.6	92.0	92.0
10	100.0	100.0	100.0	100.0	98.9	97.7	97.1	96.3	95.4	94.5	93.5	92.6	92.0	92.0
11	100.0	100.0	100.0	100.0	98.9	97.7	97.1	96.3	95.4	94.5	93.5	92.6	92.0	92.0
12	100.0	100.0	100.0	100.0	98.9	97.7	97.1	96.3	95.4	94.5	93.5	92.6	92.0	92.0
13	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	74.2	72.2	69.8
14	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	78.3	79.1	74.5
15	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
16	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	78.3	79.1	77.1	74.5
17	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
18	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
19	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
20	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
21	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
22	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
23	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.1	77.1	74.5
24	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	75.3	77.1	74.5
25	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	...	85.0	83.0	79.8
26	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	...	85.0	83.0	79.8
27	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	...	...	...	...
28	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	...	...	...	...
29	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	...	...	...	...
30	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.7	79.2	78.6	77.8	76.7	75.5	73.9
31	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.7	79.2	78.6	77.8	76.7	75.5	73.9
32	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.7	79.2	78.6	77.8	76.7	75.5	73.9
33	80.0	80.0	80.0	80.0	80.0	80.0	80.0	79.7	79.2	78.6	77.8	76.7	75.5	73.9
34	95.0	95.0	95.0	95.0	95.0	93.2	92.3	91.4	90.6	89.9	89.2	88.5	87.8	87.1
35	95.0	95.0	95.0	95.0	95.0	93.2	92.3	91.4	90.6	89.9	89.2	88.5	87.8	87.1
36	95.0	95.0	95.0	95.0	95.0	93.2	92.3	91.4	90.6	89.9	89.2	88.5	87.8	87.1
37	95.0	95.0	95.0	95.0	95.0	93.2	92.3	91.4	90.6	89.9	89.2	88.5	87.8	87.1
38	95.0	95.0	95.0	95.0	95.0	93.2	92.3	91.4	90.6	89.9	89.2	88.5	87.8	87.1
39	100.0	100.0	100.0	100.0	99.5	99.3	99.3	99.3	99.3	99.3	99.3	99.2	98.5	97.3
40	100.0	100.0	100.0	100.0	99.5	99.3	99.3	99.3	99.3	99.3	99.3	99.2	98.5	97.3
41	100.0	100.0	100.0	100.0	99.5	99.3	99.3	99.3	99.3	99.3	99.3	99.2	98.5	97.3
42	110.0	110.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	107.0	106.0
43	110.0	110.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	107.0	106.0
44	110.0	110.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	107.0	106.0
45	110	110	110	108	106	104	103	102	101	100	99.2	98.2	97.1	95.9

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	67.0	63.6	59.8	55.5	...	...	...	...	...	...	...	...	(23)
14	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
15	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
16	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
17	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
18	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
19	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
20	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
21	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
22	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
23	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
24	71.4	67.9	63.8	59.2	...	...	...	...	...	...	...	...	(23)
25	76.0	71.6	66.5	61.0	...	...	...	...	...	...	...	...	(23)
26	76.0	71.6	66.5	61.0	...	...	...	...	...	...	...	...	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	(23)
39	95.5	93.2	90.3	86.6	82.3	77.3	71.6	65.4	58.6	51.4	44.0	...	(23)
40	95.5	93.2	90.3	86.6	82.3	77.3	71.6	65.4	58.6	51.4	44.0	...	(23)
41	95.5	93.2	90.3	86.6	82.3	77.3	71.6	65.4	58.6	51.4	44.0	...	(23)
42	104.0	102.0	98.4	94.1	89.1	83.2	76.5	69.1	61.1	52.7	44.0	...	...
43	104.0	102.0	98.4	94.1	89.1	83.2	76.5	69.1	61.1	52.7	44.0	...	...
44	104.0	102.0	98.4	94.1	89.1	83.2	76.5	69.1	61.1	52.7	44.0	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	(23)

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	60Ni-22Cr-9Mo-3.5Cb	Plate, sheet	SB-443	1	N06625	Hot rolled/ann.	≤2.75	110
2	60Ni-22Cr-9Mo-3.5Cb	Sheet, strip	SB-443	1	N06625	Cold rolled/ann.	...	120
3	60Ni-22Cr-9Mo-3.5Cb	Smls. pipe	SB-444	1	N06625	Annealed	...	120
4	60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	1	N06625	Annealed	≤4	120
5	60Ni-22Cr-9Mo-3.5Cb	Forgings	SB-564	...	N06625	Annealed	≤4	120
6	60Ni-22Cr-9Mo-3.5Cb	Wld. tube	SB-704	...	N06625	Annealed	...	120
7	60Ni-22Cr-9Mo-3.5Cb	Wld. pipe	SB-705	...	N06625	Annealed	...	120
8	Ni-Cr-Mo-W	Forgings	SB-564	...	N06686	Solution ann.	...	100
9	Ni-Cr-Mo-W	Rod	SB-574	...	N06686	Solution ann.	...	100
10	Ni-Cr-Mo-W	Plate, sheet, strip	SB-575	...	N06686	Solution ann.	...	100
11	Ni-Cr-Mo-W	Wld. pipe	SB-619	...	N06686	Solution ann.	...	100
12	Ni-Cr-Mo-W	Smls. pipe & tube	SB-622	...	N06686	Solution ann.	...	100
13	Ni-Cr-Mo-W	Wld. tube	SB-626	...	N06686	Solution ann.	...	100
14	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Hot worked/ann.	>5 O.D.	75
15	58Ni-29Cr-9Fe	Smls. tube	SB-163	...	N06690	Annealed	...	85
16	58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Annealed	...	85
17	58Ni-29Cr-9Fe	Plate, sheet, strip	SB-168	...	N06690	Annealed	...	85
18	58Ni-29Cr-9Fe	Forgings	SB-564	...	N06690	Annealed	...	85
19	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold worked/ann.	...	85
20	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Hot worked/ann.	≤5 O.D.	85
21	49Ni-25Cr-18Fe-6Mo	Plate, sheet, strip	SB-582	...	N06975	Solution ann.	...	85
22	49Ni-25Cr-18Fe-6Mo	Wld. pipe	SB-619	...	N06975	Solution ann.	...	85
23	49Ni-25Cr-18Fe-6Mo	Smls. pipe & tube	SB-622	...	N06975	Solution ann.	...	85
24	49Ni-25Cr-18Fe-6Mo	Wld. tube	SB-626	...	N06975	Solution ann.	...	85
25	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed	> ³ / ₄	85
26	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed	> ³ / ₄	85
27	47Ni-22Cr-20Fe-7Mo	Smls. & wld. ftgs.	SB-366	...	N06985	Annealed	...	90
28	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed	≤ ³ / ₄	90
29	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed	≤ ³ / ₄	90
30	47Ni-22Cr-20Fe-7Mo	Wld. pipe	SB-619	...	N06985	Annealed	...	90
31	47Ni-22Cr-20Fe-7Mo	Smls. pipe & tube	SB-622	...	N06985	Annealed	...	90
32	47Ni-22Cr-20Fe-7Mo	Wld. tube	SB-626	...	N06985	Annealed	...	90
33	35Ni-35Fe-20Cr-Cb	Forgings	SB-462	...	N08020	Annealed	...	80
34	35Ni-35Fe-20Cr-Cb	Plate	SB-463	...	N08020	Annealed	...	80
35	35Ni-35Fe-20Cr-Cb	Bar	SB-473	...	N08020	Annealed	...	80
36	35Ni-35Fe-20Cr-Cb	Smls. pipe & tube	SB-729	...	N08020	Annealed	...	80
37	35Ni-35Fe-20Cr-Cb	Wld. pipe	SB-464	...	N08020	Wld. ann.	...	80
38	35Ni-35Fe-20Cr-Cb	Wld. tube	SB-468	...	N08020	Wld. ann.	...	80
39	35Ni-35Fe-20Cr-Cb	Smls. & wld. ftgs.	SB-366	...	N08020	Annealed	...	85
40	37Ni-33Fe-23Cr-4Mo-Cu	Wld. pipe	SB-464	...	N08024	Wld. ann.	...	80
41	37Ni-33Fe-23Cr-4Mo-Cu	Wld. tube	SB-468	...	N08024	Wld. ann.	...	80
42	35Ni-30Fe-24Cr-6Mo-Cu	Wld. pipe	SB-464	...	N08026	Wld. ann.	...	80
43	35Ni-30Fe-24Cr-6Mo-Cu	Wld. tube	SB-468	...	N08026	Wld. ann.	...	80
44	31Ni-31Fe-29Cr-Mo	Smls. tube	SB-668	...	N08028	Annealed	...	73
45	31Ni-31Fe-29Cr-Mo	Plate, sheet, strip	SB-709	...	N08028	Annealed	...	73

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	110.0	110.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	108.0	107.0	106.0
2	120.0	120.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	117.0	116.0
3	120.0	120.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	117.0	116.0
4	120.0	120.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	117.0	116.0
5	120.0	120.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	117.0	116.0
6	120.0	120.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	117.0	116.0
7	120.0	120.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0	117.0	116.0
8	100.0	100.0	98.8	95.3	92.7	90.8	89.9	89.1	88.2	87.1	85.9	84.5	82.8	80.9
9	100.0	100.0	98.8	95.3	92.7	90.8	89.9	89.1	88.2	87.1	85.9	84.5	82.8	80.9
10	100.0	100.0	98.8	95.3	92.7	90.8	89.9	89.1	88.2	87.1	85.9	84.5	82.8	80.9
11	100.0	100.0	98.8	95.3	92.7	90.8	89.9	89.1	88.2	87.1	85.9	84.5	82.8	80.9
12	100.0	100.0	98.8	95.3	92.7	90.8	89.9	89.1	88.2	87.1	85.9	84.5	82.8	80.9
13	100.0	100.0	98.8	95.3	92.7	90.8	89.9	89.1	88.2	87.1	85.9	84.5	82.8	80.9
14	75.0	75.0	73.8	72.5	71.4	70.7	70.5	70.3	70.2	69.9	69.5	68.9	67.9	66.4
15	85.0	85.0	84.0	82.0	80.8	80.2	80.0	79.8	79.6	79.3	78.7	78.0	76.9	75.3
16	85.0	85.0	84.0	82.0	80.8	80.2	80.0	79.8	79.6	79.3	78.7	78.0	76.9	75.3
17	85.0	85.0	84.0	82.0	80.8	80.2	80.0	79.8	79.6	79.3	78.7	78.0	76.9	75.3
18	85.0	85.0	84.0	82.0	80.8	80.2	80.0	79.8	79.6	79.3	78.7	78.0	76.9	75.3
19	85.0	84.9	83.7	82.2	81.0	80.2	79.9	79.7	79.5	79.2	78.8	78.1	76.9	75.2
20	85.0	84.9	83.7	82.2	81.0	80.2	79.9	79.7	79.5	79.2	78.8	78.1	76.9	75.2
21	85.0	85.0	85.0	83.5	81.7	80.3	79.7	79.1	78.5	78.0	77.3	76.6	75.7	74.4
22	85.0	85.0	85.0	83.5	81.7	80.3	79.7	79.1	78.5	78.0	77.3	76.6	75.7	74.4
23	85.0	85.0	85.0	83.5	81.7	80.3	79.7	79.1	78.5	78.0	77.3	76.6	75.7	74.4
24	85.0	85.0	85.0	83.5	81.7	80.3	79.7	79.1	78.5	78.0	77.3	76.6	75.7	74.4
25	85.0	85.0	83.8	80.4	77.9	76.2	75.6	75.0	74.4	73.8	73.0	72.1	70.9	69.5
26	85.0	85.0	83.8	80.4	77.9	76.2	75.6	75.0	74.4	73.8	73.0	72.1	70.9	69.5
27	90.0	90.0	88.7	85.1	82.5	80.7	80.0	79.4	78.8	78.1	77.3	76.3	75.1	73.6
28	90.0	90.0	88.7	85.1	82.5	80.7	80.0	79.4	78.8	78.1	77.3	76.3	75.1	73.6
29	90.0	90.0	88.7	85.1	82.5	80.7	80.0	79.4	78.8	78.1	77.3	76.3	75.1	73.6
30	90.0	90.0	88.7	85.1	82.5	80.7	80.0	79.4	78.8	78.1	77.3	76.3	75.1	73.6
31	90.0	90.0	88.7	85.1	82.5	80.7	80.0	79.4	78.8	78.1	77.3	76.3	75.1	73.6
32	90.0	90.0	88.7	85.1	82.5	80.7	80.0	79.4	78.8	78.1	77.3	76.3	75.1	73.6
33	80.0	80.0	79.2	77.6	77.3	77.3	77.0	76.7	76.3	76.3	...	...	...	...
34	80.0	80.0	79.2	77.6	77.3	77.3	77.0	76.7	76.3	76.3	...	...	...	...
35	80.0	80.0	79.2	77.6	77.3	77.3	77.0	76.7	76.3	76.3	...	...	...	...
36	80.0	80.0	79.2	77.6	77.3	77.3	77.0	76.7	76.3	76.3	...	...	...	...
37	80.0	80.0	79.2	77.6	77.3	77.3	77.0	76.7	76.3	76.3	...	...	...	...
38	80.0	80.0	79.2	77.6	77.3	77.3	77.0	76.7	76.3	76.3	...	...	...	...
39	85.0	85.0	84.1	82.4	82.2	82.1	81.9	81.5	81.1	81.1	...	...	...	...
40	80.0	80.0	79.0	76.8	74.8	72.9	72.1	71.4	70.8	70.3	69.9	69.5	69.2	68.6
41	80.0	80.0	79.0	76.8	74.8	72.9	72.1	71.4	70.8	70.3	69.9	69.5	69.2	68.6
42	80.0	80.0	78.6	76.2	74.1	72.1	71.1	70.1	69.1	68.1	67.2	66.4	65.7	65.0
43	80.0	80.0	78.6	76.2	74.1	72.1	71.1	70.1	69.1	68.1	67.2	66.4	65.7	65.0
44	73.0	73.0	70.4	67.6	65.4	63.6	62.9	62.1	61.4	60.7	59.9	59.0	58.1	57.1
45	73.0	73.0	70.4	67.6	65.4	63.6	62.9	62.1	61.4	60.7	59.9	59.0	58.1	57.1

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	104.0	102.0	98.4	94.1	89.1	83.2	76.5	69.1	61.1	52.7	44.0	...	...
2	114.0	111.0	107.0	103.0	97.2	90.7	83.4	75.4	66.7	57.5	48.0	...	...
3	114.0	111.0	107.0	103.0	97.2	90.7	83.4	75.4	66.7	57.5	48.0	...	...
4	114.0	111.0	107.0	103.0	97.2	90.7	83.4	75.4	66.7	57.5	48.0	...	...
5	114.0	111.0	107.0	103.0	97.2	90.7	83.4	75.4	66.7	57.5	48.0	...	...
6	114.0	111.0	107.0	103.0	97.2	90.7	83.4	75.4	66.7	57.5	48.0	...	...
7	114.0	111.0	107.0	103.0	97.2	90.7	83.4	75.4	66.7	57.5	48.0	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
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18	...	...	...	...	...	...	...	...	...	...	...	...	...
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42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. & wld. ftgs.	SB-366	...	N08031	...	...	94
2	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Forgings	SB-564	...	N08031	...	...	94
3	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Rod	SB-581	...	N08031	...	...	94
4	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. pipe	SB-619	...	N08031	...	...	94
5	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. pipe & tube	SB-622	...	N08031	...	...	94
6	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08031	...	...	94
7	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. tube	SB-626	...	N08031	...	...	94
8	37Ni-33Fe-25Cr	Condenser tube	SB-163	...	N08120	Solution ann.	...	90
9	37Ni-33Fe-25Cr	Smls. & wld. ftgs.	SB-366	...	N08120	Solution ann.	...	90
10	37Ni-33Fe-25Cr	Smls. pipe & tube	SB-407	...	N08120	Solution ann.	...	90
11	37Ni-33Fe-25Cr	Bar, rod	SB-408	...	N08120	Solution ann.	...	90
12	37Ni-33Fe-25Cr	Plate, sheet, strip	SB-409	...	N08120	Solution ann.	...	90
13	37Ni-33Fe-25Cr	Wld. pipe	SB-514	...	N08120	Solution ann.	...	90
14	37Ni-33Fe-25Cr	Wld. tube	SB-515	...	N08120	Solution ann.	...	90
15	37Ni-33Fe-25Cr	Forgings	SB-564	...	N08120	Solution ann.	...	90
16	26Ni-43Fe-22Cr-5Mo	Wld. pipe	SB-619	...	N08320	Solution ann.	...	75
17	26Ni-43Fe-22Cr-5Mo	Plate, sheet, strip	SB-620	...	N08320	Solution ann.	...	75
18	26Ni-43Fe-22Cr-5Mo	Rod	SB-621	...	N08320	Solution ann.	...	75
19	26Ni-43Fe-22Cr-5Mo	Smls. pipe & tube	SB-622	...	N08320	Solution ann.	...	75
20	26Ni-43Fe-22Cr-5Mo	Wld. tube	SB-626	...	N08320	Solution ann.	...	75
21	35Ni-19Cr-1 $\frac{1}{4}$ Si	Bar	SB-511	...	N08330	...	...	70
22	35Ni-19Cr-1 $\frac{1}{4}$ Si	Pipe	SB-535	...	N08330	...	...	70
23	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate	SB-536	...	N08330	...	...	70
24	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. ftgs.	SB-366	...	N08330	Annealed	...	70
25	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. pipe	SB-535	...	N08330	Annealed	...	70
26	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate, sheet, strip	SB-536	...	N08330	Annealed	...	70
27	35Ni-19Cr-1 $\frac{1}{4}$ Si	Wld. pipe	SB-710	...	N08330	Annealed	...	70
28	35Ni-23Cr-7.5Mo-N	Plate, sheet, strip	SB-625	...	N08354	Solution ann.	...	95
29	35Ni-23Cr-7.5Mo-N	Bar, wire	SB-649	...	N08354	Solution ann.	...	95
30	35Ni-23Cr-7.5Mo-N	Wld. pipe	SB-673	...	N08354	Solution ann.	...	95
31	35Ni-23Cr-7.5Mo-N	Wld. tube	SB-674	...	N08354	Solution ann.	...	95
32	35Ni-23Cr-7.5Mo-N	Smls. pipe & tube	SB-677	...	N08354	Solution ann.	...	95
33	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-462	...	N08367	Solution ann.	...	95
34	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-564	...	N08367	Solution ann.	...	95
35	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.	$>\frac{3}{16}$	95
36	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.	$>\frac{3}{16}$	95
37	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.	$>\frac{3}{16}$	95
38	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.	$>\frac{3}{16}$	95
39	46Fe-24Ni-21Cr-6Mo-N	Bar, rod, wire	SB-691	...	N08367	Solution ann.	...	95
40	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.	$>\frac{3}{16}$	95
41	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.	$\leq\frac{3}{16}$	100
42	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.	$\leq\frac{3}{16}$	100
43	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.	$\leq\frac{3}{16}$	100
44	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.	$\leq\frac{3}{16}$	100
45	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.	$\leq\frac{3}{16}$	100

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
2	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
3	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
4	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
5	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
6	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
7	94.0	94.0	90.5	85.8	81.6	78.1	76.7	75.6	74.7	74.0	73.2	72.2	...	...
8	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
9	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
10	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
11	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
12	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
13	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
14	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
15	90.0	90.0	87.5	84.7	83.1	82.2	82.0	81.8	81.6	81.3	80.9	80.3	79.5	78.3
16	75.0	75.0	74.2	71.7	70.4	70.0	69.9	69.9	69.8	69.5	...	...	...	...
17	75.0	75.0	74.2	71.7	70.4	70.0	69.9	69.9	69.8	69.5	...	...	...	...
18	75.0	75.0	74.2	71.7	70.4	70.0	69.9	69.9	69.8	69.5	...	...	...	...
19	75.0	75.0	74.2	71.7	70.4	70.0	69.9	69.9	69.8	69.5	...	...	...	...
20	75.0	75.0	74.2	71.7	70.4	70.0	69.9	69.9	69.8	69.5	...	...	...	...
21	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
22	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
23	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
24	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
25	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
26	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
27	70.0	70.0	70.0	68.6	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.9	66.7	64.9
28	92.8	92.8	87.5	83.4	80.6	78.8	78.1	77.4	76.7	76.0	...	...	...	...
29	92.8	92.8	87.5	83.4	80.6	78.8	78.1	77.4	76.7	76.0	...	...	...	...
30	92.8	92.8	87.5	83.4	80.6	78.8	78.1	77.4	76.7	76.0	...	...	...	...
31	92.8	92.8	87.5	83.4	80.6	78.8	78.1	77.4	76.7	76.0	...	...	...	...
32	92.8	92.8	87.5	83.4	80.6	78.8	78.1	77.4	76.7	76.0	...	...	...	...
33	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
34	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
35	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
36	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
37	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
38	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
39	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
40	95.0	95.0	89.8	85.9	83.3	81.5	80.8	80.2	79.7	79.2	78.7	78.0	...	...
41	100.0	100.0	94.5	90.5	87.7	85.8	85.1	84.4	83.9	83.4	82.8	82.2	...	...
42	100.0	100.0	94.5	90.5	87.7	85.8	85.1	84.4	83.9	83.4	82.8	82.2	...	...
43	100.0	100.0	94.5	90.5	87.7	85.8	85.1	84.4	83.9	83.4	82.8	82.2	...	...
44	100.0	100.0	94.5	90.5	87.7	85.8	85.1	84.4	83.9	83.4	82.8	82.2	...	...
45	100.0	100.0	94.5	90.5	87.7	85.8	85.1	84.4	83.9	83.4	82.8	82.2	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
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19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
22	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
23	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
24	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
25	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
26	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
27	62.2	59.5	56.4	52.9	49.1	44.9	40.5	35.9	31.3	26.9	22.7	19.0	16.1
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	46Fe-24Ni-21Cr-6Mo-N	Castings	SA-351	CN3MN	J94651	Solution ann.	...	80
2	25Ni-47Fe-21Cr-5Mo	Plate, sheet, strip	SB-599	...	N08700	Solution ann.	...	80
3	25Ni-47Fe-21Cr-5Mo	Bar, wire	SB-672	...	N08700	Solution ann.	...	80
4	32Ni-45Fe-20Cr-Cb	Castings	SA-351	CT15C	...	As cast	...	63
5	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Annealed	...	75
6	33Ni-42Fe-21Cr	Smls. & wld. ftgs.	SB-366	...	N08800	Annealed	...	75
7	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08800	Annealed	...	75
8	33Ni-42Fe-21Cr	Bar	SB-408	...	N08800	Annealed	...	75
9	33Ni-42Fe-21Cr	Plate	SB-409	...	N08800	Annealed	...	75
10	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08800	Annealed	...	75
11	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08800	Annealed	...	75
12	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08800	Annealed	...	75
13	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Cold worked	...	83
14	32Ni-44Fe-21Cr	Smls. tube	SB-163	...	N08801	Ann./stabilized	...	65
15	32Ni-44Fe-21Cr	Smls. pipe & tube	SB-407	...	N08801	Ann./stabilized	...	65
16	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08810	Annealed	...	65
17	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08810	Annealed	...	65
18	33Ni-42Fe-21Cr	Bar	SB-408	...	N08810	Annealed	...	65
19	33Ni-42Fe-21Cr	Plate	SB-409	...	N08810	Annealed	...	65
20	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08810	Annealed	...	65
21	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08810	Annealed	...	65
22	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08810	Annealed	...	65
23	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08811	Annealed	...	65
(23) 24	...	...	...	...	...	...	...	...
25	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08811	Annealed	...	65
(23) 26	...	...	...	...	...	...	...	...
27	33Ni-42Fe-21Cr	Bar	SB-408	...	N08811	Annealed	...	65
(23) 28	...	...	...	...	...	...	...	...
29	32Ni-44Fe-21Cr	Plate	SB-409	...	N08811	Annealed	...	65
(23) 30	...	...	...	...	...	...	...	...
31	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08811	Annealed	...	65
(23) 32	...	...	...	...	...	...	...	...
33	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08811	Annealed	...	65
(23) 34	...	...	...	...	...	...	...	...
35	42Ni-21.5Cr-3Mo-2.3Cu	Smls. tube	SB-163	...	N08825	Annealed	...	85
36	42Ni-21.5Cr-3Mo-2.3Cu	Smls. & wld. ftgs.	SB-366	...	N08825	Annealed	...	85
37	42Ni-21.5Cr-3Mo-2.3Cu	Smls. pipe & tube	SB-423	...	N08825	Cold worked/ann.	...	85
38	42Ni-21.5Cr-3Mo-2.3Cu	Plate	SB-424	...	N08825	Annealed	...	85
39	42Ni-21.5Cr-3Mo-2.3Cu	Bar, rod	SB-425	...	N08825	Annealed	...	85
40	42Ni-21.5Cr-3Mo-2.3Cu	Forgings	SB-564	...	N08825	Annealed	...	85
41	42Ni-21.5Cr-3Mo-2.3Cu	Wld. tube	SB-704	...	N08825	Annealed	...	85
42	42Ni-21.5Cr-3Mo-2.3Cu	Wld. pipe	SB-705	...	N08825	Annealed	...	85
43	44Fe-25Ni-21Cr-Mo	Forgings	SA-182	...	N08904	Annealed	...	71
44	44Fe-25Ni-21Cr-Mo	Plate, sheet, strip	SA-240	...	N08904	Annealed	...	71
45	44Fe-25Ni-21Cr-Mo	Wld. tube	SA-249	...	N08904	Annealed	...	71

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	80.0	75.5	69.6	65.7	63.0	60.8	59.8	58.9	58.0	57.2	56.5	55.9	55.3	54.8
2	80.0	80.0	79.2	77.2	75.2	75.0	74.8	...	...	...	...	...	...	...
3	80.0	80.0	79.2	77.2	75.2	75.0	74.8	...	...	...	...	...	...	...
4	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	...	...	...
5	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
6	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
7	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
8	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
9	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
10	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
11	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
12	75.0	75.0	75.0	75.0	74.7	74.6	74.6	74.5	74.2	73.9	73.3	72.5	71.4	70.0
13	83.0	83.0	83.0	82.5	80.7	80.0	79.9	...	...	...	...	...	...	...
14	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
15	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
16	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
17	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
18	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
19	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
20	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
21	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
22	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
23	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
32	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	65.0	65.0	65.0	64.6	64.0	63.8	63.8	63.8	63.8	63.8	63.8	63.6	63.1	62.3
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
36	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
37	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
38	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
39	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
40	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
41	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
42	85.0	85.0	85.0	85.0	85.0	85.0	84.6	84.2	83.7	83.1	82.4	81.5	80.4	79.0
43	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...
44	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...
45	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
6	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
7	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
8	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
9	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
10	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
11	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
12	66.0	62.3	57.9	53.0	47.7	42.3	36.9	32.0	28.1	25.6	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
17	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
18	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
19	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
20	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
21	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
22	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
23	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	60.0	57.7	55.1	52.2	49.0	45.5	41.8	38.0	34.1	30.2	26.3	22.5	19.0
34	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
(23) 1	44Fe-25Ni-21Cr-Mo	Smls. & wld. pipe	SA-312	...	N08904	Annealed	...	71
(23) 2	44Fe-25Ni-21Cr-Mo	Smls. tube	SA-213	...	N08904	Annealed	...	71
(23) 3	44Fe-25Ni-21Cr-Mo	Fittings	SA-403	...	N08904	Annealed	...	71
(23) 4	44Fe-25Ni-21Cr-Mo	Bar	SA-479	...	N08904	Annealed	...	71
5	25Ni-20Cr-6Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08925	Annealed	...	87
6	25Ni-20Cr-6Mo-Cu-N	Bar, wire	SB-649	...	N08925	Annealed	...	87
7	25Ni-20Cr-6Mo-Cu-N	Wld. pipe	SB-673	...	N08925	Annealed	...	87
8	25Ni-20Cr-6Mo-Cu-N	Wld. tube	SB-674	...	N08925	Annealed	...	87
9	25Ni-20Cr-6Mo-Cu-N	Smls. pipe & tube	SB-677	...	N08925	Annealed	...	87
10	62Ni-28Mo-5Fe	Plate	SB-333	...	N10001	Annealed	...	100
11	62Ni-28Mo-5Fe	Smls. & wld. ftgs.	SB-366	...	N10001	Annealed	...	100
12	62Ni-28Mo-5Fe	Wld. pipe	SB-619	...	N10001	Solution ann.	...	100
13	62Ni-28Mo-5Fe	Smls. pipe & tube	SB-622	...	N10001	Solution ann.	...	100
14	62Ni-28Mo-5Fe	Wld. tube	SB-626	...	N10001	Solution ann.	...	100
15	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed	...	100
16	62Ni-28Mo-5Fe	Sheet, strip	SB-333	...	N10001	Annealed	...	115
17	70Ni-16Mo-7Cr-5Fe	Smls. & wld. ftgs.	SB-366	...	N10003	Annealed	...	100
18	70Ni-16Mo-7Cr-5Fe	Plate, sheet, strip	SB-434	...	N10003	Annealed	...	100
19	70Ni-16Mo-7Cr-5Fe	Rod	SB-573	...	N10003	Annealed	...	100
20	62Ni-25Mo-8Cr-2Fe	Smls. & wld. ftgs.	SB-366	...	N10242	Annealed	...	105
21	62Ni-25Mo-8Cr-2Fe	Plate, sheet, strip	SB-434	...	N10242	Annealed	...	105
22	62Ni-25Mo-8Cr-2Fe	Forgings	SB-564	...	N10242	Annealed	...	105
23	62Ni-25Mo-8Cr-2Fe	Rod	SB-573	...	N10242	Annealed	...	105
24	62Ni-25Mo-8Cr-2Fe	Wld. pipe	SB-619	...	N10242	Solution ann.	...	105
25	62Ni-25Mo-8Cr-2Fe	Smls. pipe & tube	SB-622	...	N10242	Solution ann.	...	105
26	62Ni-25Mo-8Cr-2Fe	Wld. tube	SB-626	...	N10242	Solution ann.	...	105
27	54Ni-16Mo-15Cr	Smls. & wld. ftgs.	SB-366	...	N10276	Solution ann.	...	100
28	54Ni-16Mo-15Cr	Forgings	SB-462	...	N10276	Solution ann.	...	100
29	54Ni-16Mo-15Cr	Forgings	SB-564	...	N10276	Solution ann.	...	100
30	54Ni-16Mo-15Cr	Rod	SB-574	...	N10276	Solution ann.	...	100
31	54Ni-16Mo-15Cr	Plate, sheet, strip	SB-575	...	N10276	Solution ann.	...	100
32	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.	...	100
33	54Ni-16Mo-15Cr	Smls. pipe & tube	SB-622	...	N10276	Solution ann.	...	100
34	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.	...	100
35	62Ni-22Mo-15Cr	Smls. & wld. ftgs.	SB-366	...	N10362	Solution ann.	...	105
36	62Ni-22Mo-15Cr	Forgings	SB-462	...	N10362	Solution ann.	...	105
37	62Ni-22Mo-15Cr	Forgings	SB-564	...	N10362	Solution ann.	...	105
38	62Ni-22Mo-15Cr	Rod	SB-574	...	N10362	Solution ann.	...	105
39	62Ni-22Mo-15Cr	Plate, sheet, strip	SB-575	...	N10362	Solution ann.	...	105
40	62Ni-22Mo-15Cr	Wld. pipe	SB-619	...	N10362	Solution ann.	...	105
41	62Ni-22Mo-15Cr	Smls. pipe & tube	SB-622	...	N10362	Solution ann.	...	105
42	62Ni-22Mo-15Cr	Wld. tube	SB-626	...	N10362	Solution ann.	...	105
43	Ni-28Mo-3Fe-1.3Cr-0.25Al	Plate, sheet, strip	SB-333	...	N10629	...	...	110
44	Ni-28Mo-3Fe-1.3Cr-0.25Al	Rod	SB-335	...	N10629	...	...	110
45	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. & wld. ftgs.	SB-366	...	N10629	...	...	110

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)														
1	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...
2	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...
3	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...
4	71.0	71.0	67.8	65.4	63.6	62.2	61.6	61.0	60.5	...	...	...	...	...
5	87.0	87.0	83.8	80.4	77.4	74.9	73.8	72.7	71.5	70.2	...	...	...	...
6	87.0	87.0	83.8	80.4	77.4	74.9	73.8	72.7	71.5	70.2	...	...	...	...
7	87.0	87.0	83.8	80.4	77.4	74.9	73.8	72.7	71.5	70.2	...	...	...	...
8	87.0	87.0	83.8	80.4	77.4	74.9	73.8	72.7	71.5	70.2	...	...	...	...
9	87.0	87.0	83.8	80.4	77.4	74.9	73.8	72.7	71.5	70.2	...	...	...	...
10	100.0	100.0	100.0	98.4	97.4	96.8	96.4	96.0	95.6	95.2	...	...	...	...
11	100.0	100.0	100.0	98.4	97.4	96.8	96.4	96.0	95.6	95.2	...	...	...	...
12	100.0	100.0	100.0	98.4	97.4	96.8	96.4	96.0	95.6	95.2	...	...	...	...
13	100.0	100.0	100.0	98.4	97.4	96.8	96.4	96.0	95.6	95.2	...	...	...	...
14	100.0	100.0	100.0	98.4	97.4	96.8	96.4	96.0	95.6	95.2	...	...	...	...
15	100.0	100.0	100.0	98.4	97.4	96.8	96.4	96.0	95.6	95.2	...	...	...	...
16	115.0	115.0	115.0	113.1	112.0	111.3	110.9	110.4	109.9	109.5	...	...	...	...
17	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.0	96.0	93.6
18	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.0	96.0	93.6
19	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.0	96.0	93.6
20	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
21	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
22	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
23	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
24	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
25	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
26	105.0	105.0	105.0	105.0	105.0	104.4	104.2	103.9	103.7	103.5	103.3	103.2	103.1	103.1
27	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
28	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
29	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
30	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
31	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
32	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
33	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
34	100.0	100.0	100.0	97.7	95.7	93.9	93.1	92.4	91.7	90.9	90.2	89.4	88.5	87.6
35	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
36	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
37	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
38	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
39	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
40	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
41	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
42	105.0	105.0	105.0	103.0	101.0	99.5	99.2	99.0	98.7	98.3	...	...	...	...
43	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...
44	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...
45	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	90.9	87.8	84.3	80.5	76.4	...	...	...	...	...	...	...	...
18	90.9	87.8	84.3	80.5	76.4	...	...	...	...	...	...	...	...
19	90.9	87.8	84.3	80.5	76.4	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
28	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
29	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
30	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
31	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
32	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
33	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
34	86.2	84.7	82.9	80.9	78.6	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	Ni-28Mo-3Fe-1.3Cr-0.25Al	Forgings	SB-564	...	N10629	...	...	110
2	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. pipe	SB-619	...	N10629	...	...	110
3	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. pipe & tube	SB-622	...	N10629	...	...	110
4	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. tube	SB-626	...	N10629	...	...	110
5	65Ni-28Mo-2Fe	Smls. & wld. ftgs.	SB-366	...	N10665	Annealed	...	110
6	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Annealed	...	110
7	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Annealed	...	110
8	65Ni-28Mo-2Fe	Plate, sheet, strip	SB-333	...	N10665	Solution ann.	...	110
9	65Ni-28Mo-2Fe	Rod	SB-335	...	N10665	Solution ann.	...	110
10	65Ni-28Mo-2Fe	Forgings	SB-462	...	N10665	Solution ann.	...	110
11	65Ni-28Mo-2Fe	Forgings	SB-564	...	N10665	Solution ann.	...	110
12	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Solution ann.	...	110
13	65Ni-28Mo-2Fe	Smls. pipe & tube	SB-622	...	N10665	Solution ann.	...	110
14	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Solution ann.	...	110
15	65Ni-29.5Mo-2Fe-2Cr	Plate, sheet, strip	SB-333	...	N10675	Solution ann.	...	110
16	65Ni-29.5Mo-2Fe-2Cr	Rod	SB-335	...	N10675	Solution ann.	...	110
17	65Ni-29.5Mo-2Fe-2Cr	Smls. & wld. ftgs.	SB-366	...	N10675	Solution ann.	...	110
18	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-462	...	N10675	Solution ann.	...	110
19	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-564	...	N10675	Solution ann.	...	110
20	65Ni-29.5Mo-2Fe-2Cr	Wld. pipe	SB-619	...	N10675	Solution ann.	...	110
21	65Ni-29.5Mo-2Fe-2Cr	Smls. pipe & tube	SB-622	...	N10675	Solution ann.	...	110
22	65Ni-29.5Mo-2Fe-2Cr	Wld. tube	SB-626	...	N10675	Solution ann.	...	110
23	37Ni-30Co-28Cr-2.7Si	Plate, sheet, strip	SB-435	...	N12160	Solution ann.	...	90
24	37Ni-30Co-28Cr-2.7Si	Forgings	SB-564	...	N12160	Solution ann.	...	90
25	37Ni-30Co-28Cr-2.7Si	Rod	SB-572	...	N12160	Solution ann.	...	90
26	37Ni-30Co-28Cr-2.7Si	Wld. pipe	SB-619	...	N12160	Solution ann.	...	90
27	37Ni-30Co-28Cr-2.7Si	Smls. pipe & tube	SB-622	...	N12160	Solution ann.	...	90
28	37Ni-30Co-28Cr-2.7Si	Wld. tube	SB-626	...	N12160	Solution ann.	...	90
29	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Smls. & wld. ftgs.	SB-366	...	R20033	...	...	109
30	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Forgings	SB-564	...	R20033	...	...	109
31	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Wld. pipe	SB-619	...	R20033	...	...	109
32	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Smls. pipe & tube	SB-622	...	R20033	...	...	109
33	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Plate, sheet, strip	SB-625	...	R20033	...	...	109
34	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Wld. tube	SB-626	...	R20033	...	...	109
35	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Rod	SB-649	...	R20033	...	...	109
36	21Ni-30Fe-22Cr-18Co-3Mo-3W	Plate, sheet, strip	SB-435	...	R30556	Annealed	...	100
37	21Ni-30Fe-22Cr-18Co-3Mo-3W	Rod	SB-572	...	R30556	Annealed	...	100
38	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. pipe	SB-619	...	R30556	Annealed	...	100
39	21Ni-30Fe-22Cr-18Co-3Mo-3W	Smls. pipe & tube	SB-622	...	R30556	Annealed	...	100
40	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. tube	SB-626	...	R30556	Annealed	...	100
41	Co-26Cr-9Ni-5Mo-3Fe-2W	Rod	SB-815	...	R31233	Solution ann.	...	130
42	Co-26Cr-9Ni-5Mo-3Fe-2W	Plate, sheet, strip	SB-818	...	R31233	Solution ann.	...	130
43	Ti	Plate, sheet, strip	SB-265	1	R50250	Annealed	...	35
44	Ti	Smls. & wld. tube	SB-338	1	R50250	Annealed	...	35
45	Ti	Bar, billet	SB-348	1	R50250	Annealed	...	35

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...
2	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...
3	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...
4	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.0	...
5	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
6	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
7	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
8	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
9	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
10	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
11	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
12	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
13	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
14	110.0	110.0	110.0	110.0	110.0	109.2	108.7	108.1	107.6	107.0	106.5	105.9	105.5	105.3
15	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
16	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
17	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
18	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
19	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
20	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
21	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
22	110.0	110.0	110.0	110.0	108.7	107.1	106.4	105.8	105.2	104.7	104.2	103.8	103.3	102.8
23	90.0	90.0	90.0	87.8	85.5	83.3	82.2	81.1	80.0	78.9	77.8	76.6	75.4	74.1
24	90.0	90.0	90.0	87.8	85.5	83.3	82.2	81.1	80.0	78.9	77.8	76.6	75.4	74.1
25	90.0	90.0	90.0	87.8	85.5	83.3	82.2	81.1	80.0	78.9	77.8	76.6	75.4	74.1
26	90.0	90.0	90.0	87.8	85.5	83.3	82.2	81.1	80.0	78.9	77.8	76.6	75.4	74.1
27	90.0	90.0	90.0	87.8	85.5	83.3	82.2	81.1	80.0	78.9	77.8	76.6	75.4	74.1
28	90.0	90.0	90.0	87.8	85.5	83.3	82.2	81.1	80.0	78.9	77.8	76.6	75.4	74.1
29	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
30	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
31	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
32	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
33	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
34	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
35	109.0	109.0	103.2	97.8	93.7	90.6	89.3	88.2	87.1	86.0	84.9	83.5	...	...
36	100.0	100.0	97.9	94.7	92.5	91.1	90.5	90.1	89.7	89.3	88.8	88.2	87.5	86.6
37	100.0	100.0	97.9	94.7	92.5	91.1	90.5	90.1	89.7	89.3	88.8	88.2	87.5	86.6
38	100.0	100.0	97.9	94.7	92.5	91.1	90.5	90.1	89.7	89.3	88.8	88.2	87.5	86.6
39	100.0	100.0	97.9	94.7	92.5	91.1	90.5	90.1	89.7	89.3	88.8	88.2	87.5	86.6
40	100.0	100.0	97.9	94.7	92.5	91.1	90.5	90.1	89.7	89.3	88.8	88.2	87.5	86.6
41	130.0	130.0	130.0	130.0	130.0	130.0	130.0	128.3	126.6	125.2	124.1	123.0	121.9	120.4
42	130.0	130.0	130.0	130.0	130.0	130.0	130.0	128.3	126.6	125.2	124.1	123.0	121.9	120.4
43	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
44	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
45	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	Ti	Smls. & wld. ftgs.	SB-363	WPT1	R50250	Annealed	...	35
2	Ti	Forgings	SB-381	F-1	R50250	Annealed	...	35
3	Ti	Smls. pipe	SB-861	1	R50250	Annealed	...	35
4	Ti	Wld. pipe	SB-862	1	R50250	Annealed	...	35
5	Ti	Castings	SB-367	C-2	R50400	...	...	50
6	Ti	Forgings	SB-381	F-2	R50400	Annealed	...	50
7	Ti	Plate, sheet, strip	SB-265	2H	R50400	Annealed	...	58
8	Ti	Smls. & wld. tube	SB-338	2H	R50400	Annealed	...	58
9	Ti	Bar, billet	SB-348	2H	R50400	Annealed	...	58
10	Ti	Smls. fittings	SB-363	WPT2H	R50400	Annealed	...	58
11	Ti	Wld. fittings	SB-363	WPT2HW	R50400	Annealed	...	58
12	Ti	Forgings	SB-381	F-2H	R50400	Annealed	...	58
13	Ti	Smls. pipe	SB-861	2H	R50400	Annealed	...	58
14	Ti	Wld. pipe	SB-862	2H	R50400	Annealed	...	58
15	Ti	Castings	SB-367	C-3	R50550	...	...	65
16	Ti	Plate, sheet, strip	SB-265	3	R50550	Annealed	...	65
17	Ti	Smls. & wld. tube	SB-338	3	R50550	Annealed	...	65
18	Ti	Bar, billet	SB-348	3	R50550	Annealed	...	65
19	Ti	Smls. & wld. ftgs.	SB-363	WPT3	R50550	Annealed	...	65
20	Ti	Forgings	SB-381	F-3	R50550	Annealed	...	65
21	Ti	Smls. pipe	SB-861	3	R50550	Annealed	...	65
22	Ti	Wld. pipe	SB-862	3	R50550	Annealed	...	65
23	Ti-Pd	Plate, sheet, strip	SB-265	11	R52250	Annealed	...	35
24	Ti-Pd	Plate, sheet, strip	SB-265	17	R52252	Annealed	...	35
25	Ti-Ru	Plate, sheet, strip	SB-265	27	R52254	Annealed	...	35
26	Ti-Pd	Plate, sheet, strip	SB-265	7	R52400	Annealed	...	50
27	Ti-0.15Pd	Plate, sheet, strip	SB-265	7H	R52400	Annealed	...	58
28	Ti-0.15Pd	Smls. & wld. tube	SB-338	7H	R52400	Annealed	...	58
29	Ti-0.15Pd	Bar, billet	SB-348	7H	R52400	Annealed	...	58
30	Ti-0.15Pd	Smls. fittings	SB-363	WPT7H	R52400	Annealed	...	58
31	Ti-0.15Pd	Wld. fittings	SB-363	WPT7HW	R52400	Annealed	...	58
32	Ti-0.15Pd	Forgings	SB-381	F-7H	R52400	Annealed	...	58
33	Ti-0.15Pd	Smls. pipe	SB-861	7H	R52400	Annealed	...	58
34	Ti-0.15Pd	Wld. pipe	SB-862	7H	R52400	Annealed	...	58
35	Ti-Pd	Plate, sheet, strip	SB-265	16	R52402	Annealed	...	50
36	Ti-Pd	Bar, billet	SB-348	16	R52402	Annealed	...	50
37	Ti-Pd	Forgings	SB-381	F-16	R52402	Annealed	...	50
38	Ti-0.05Pd	Plate, sheet, strip	SB-265	16H	R52402	Annealed	...	58
39	Ti-0.05Pd	Smls. & wld. tube	SB-338	16H	R52402	Annealed	...	58
40	Ti-0.05Pd	Bar, billet	SB-348	16H	R52402	Annealed	...	58
41	Ti-0.05Pd	Smls. fittings	SB-363	WPT16H	R52402	Annealed	...	58
42	Ti-0.05Pd	Wld. fittings	SB-363	WPT16HW	R52402	Annealed	...	58
43	Ti-0.05Pd	Forgings	SB-381	F-16H	R52402	Annealed	...	58
44	Ti-0.05Pd	Smls. pipe	SB-861	16H	R52402	Annealed	...	58
45	Ti-0.05Pd	Wld. pipe	SB-862	16H	R52402	Annealed	...	58

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
2	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
3	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
4	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
5	50.0	41.3	34.1	28.4	23.8	...	...	...	...	...	...	...	...	...
6	50.0	43.6	36.2	30.9	26.6	22.8	...	...	...	...	...	...	...	...
7	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
8	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
9	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
10	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
11	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
12	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
13	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
14	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
15	65.0	55.2	44.6	36.2	29.8	...	...	...	...	...	...	...	...	...
16	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
17	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
18	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
19	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
20	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
21	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
22	65.0	55.2	44.6	36.2	29.8	25.8	...	...	...	...	...	...	...	...
23	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
24	35.0	29.2	23.2	19.2	16.4	12.4	...	...	...	...	...	...	...	...
25	35.0	28.9	23.1	19.3	16.3	12.5	...	...	...	...	...	...	...	...
26	50.0	43.6	36.2	30.9	26.6	22.8	...	...	...	...	...	...	...	...
27	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
28	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
29	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
30	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
31	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
32	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
33	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
34	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
35	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
36	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
37	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
38	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
39	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
40	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
41	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
42	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
43	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
44	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
45	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	Ti-Ru	Plate, sheet, strip	SB-265	26	R52404	Annealed	...	50
2	Ti-Ru	Smls. & wld. tube	SB-338	26	R52404	Annealed	...	50
3	Ti-Ru	Bar, billet	SB-348	26	R52404	Annealed	...	50
4	Ti-Ru	Smls. fittings	SB-363	WPT26	R52404	Annealed	...	50
5	Ti-Ru	Wld. fittings	SB-363	WPT26W	R52404	Annealed	...	50
6	Ti-Ru	Forgings	SB-381	F-26	R52404	Annealed	...	50
7	Ti-Ru	Smls. pipe	SB-861	26	R52404	Annealed	...	50
8	Ti-Ru	Wld. pipe	SB-862	26	R52404	Annealed	...	50
9	Ti-0.10Ru	Plate, sheet, strip	SB-265	26H	R52404	Annealed	...	58
10	Ti-0.10Ru	Smls. & wld. tube	SB-338	26H	R52404	Annealed	...	58
11	Ti-0.10Ru	Bar, billet	SB-348	26H	R52404	Annealed	...	58
12	Ti-0.10Ru	Smls. fittings	SB-363	WPT26H	R52404	Annealed	...	58
13	Ti-0.10Ru	Wld. fittings	SB-363	WPT26HW	R52404	Annealed	...	58
14	Ti-0.10Ru	Forgings	SB-381	F-26H	R52404	Annealed	...	58
15	Ti-0.10Ru	Smls. pipe	SB-861	26H	R52404	Annealed	...	58
16	Ti-0.10Ru	Wld. pipe	SB-862	26H	R52404	Annealed	...	58
17	Ti-0.3Mo-0.8Ni	Forgings	SB-381	F-12	R53400	Annealed	...	70
18	Ti-4Al-2.5V-1.5Fe	Plate, sheet, strip	SB-265	38	R54250	Annealed	...	130
19	Ti-4Al-2.5V-1.5Fe	Smls. tube	SB-338	38	R54250	Annealed	...	130
20	Ti-4Al-2.5V-1.5Fe	Wld. tube	SB-338	38	R54250	Annealed	...	130
21	Ti-4Al-2.5V-1.5Fe	Bar, billet	SB-348	38	R54250	Annealed	...	130
22	Ti-4Al-2.5V-1.5Fe	Smls. fittings	SB-363	WPT38	R54250	Annealed	...	130
23	Ti-4Al-2.5V-1.5Fe	Wld. fittings	SB-363	WPT38W	R54250	Annealed	...	130
24	Ti-4Al-2.5V-1.5Fe	Forgings	SB-381	F-38	R54250	Annealed	...	130
25	Ti-4Al-2.5V-1.5Fe	Smls. pipe	SB-861	38	R54250	Annealed	...	130
26	Ti-4Al-2.5V-1.5Fe	Wld. pipe	SB-862	38	R54250	Annealed	...	130
27	Ti-3Al-2.5V	Plate, sheet, strip	SB-265	9	R56320	Annealed	...	90
28	Ti-3Al-2.5V	Smls. & wld. tube	SB-338	9	R56320	Annealed	...	90
29	Ti-3Al-2.5V	Bar, billet	SB-348	9	R56320	Annealed	...	90
30	Ti-3Al-2.5V	Smls. fittings	SB-363	WPT9	R56320	Annealed	...	90
31	Ti-3Al-2.5V	Wld. fittings	SB-363	WPT9W	R56320	Annealed	...	90
32	Ti-3Al-2.5V	Forgings	SB-381	F-9	R56320	Annealed	...	90
33	Ti-3Al-2.5V	Smls. pipe	SB-861	9	R56320	Annealed	...	90
34	Ti-3Al-2.5V	Wld. pipe	SB-862	9	R56320	Annealed	...	90
35	Ti-3Al-2.5V-0.1Ru	Plate, sheet, strip	SB-265	28	R56323	Annealed	...	90
36	Ti-3Al-2.5V-0.1Ru	Smls. & wld. tube	SB-338	28	R56323	Annealed	...	90
37	Ti-3Al-2.5V-0.1Ru	Bar, billet	SB-348	28	R56323	Annealed	...	90
38	Ti-3Al-2.5V-0.1Ru	Smls. fittings	SB-363	WPT28	R56323	Annealed	...	90
39	Ti-3Al-2.5V-0.1Ru	Wld. fittings	SB-363	WPT28W	R56323	Annealed	...	90
40	Ti-3Al-2.5V-0.1Ru	Forgings	SB-381	F-28	R56323	Annealed	...	90
41	Ti-3Al-2.5V-0.1Ru	Smls. pipe	SB-861	28	R56323	Annealed	...	90
42	Ti-3Al-2.5V-0.1Ru	Wld. pipe	SB-862	28	R56323	Annealed	...	90
43	99.2Zr	Forgings	SB-493	...	R60702	Annealed	...	55
44	99.2Zr	Smls. & wld. tube	SB-523	...	R60702	Annealed	...	55
45	99.2Zr	Bar, wire	SB-550	...	R60702	Annealed	...	55

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
2	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
3	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
4	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
5	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
6	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
7	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
8	50.0	43.6	36.0	30.8	26.4	22.8	...	...	...	...	...	...	...	...
9	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
10	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
11	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
12	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
13	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
14	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
15	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
16	58.0	50.5	42.0	35.8	30.9	26.5	...	...	...	...	...	...	...	...
17	70.0	65.4	56.8	50.0	45.7	43.2	...	...	...	...	...	...	...	...
18	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
19	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
20	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
21	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
22	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
23	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
24	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
25	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
26	130.0	129.1	118.1	108.6	101.4	96.9	95.4	...	...	...	...	...	...	...
27	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
28	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
29	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
30	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
31	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
32	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
33	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
34	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
35	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
36	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
37	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
38	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
39	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
40	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
41	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
42	90.0	86.6	79.1	70.5	63.4	60.3	...	...	...	...	...	...	...	...
43	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...
44	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...
45	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper	Size/Thickness, in.	Min. Tensile Strength, ksi
Nonferrous Materials (Cont'd)								
1	99.2Zr	Plate, sheet, strip	SB-551	...	R60702	Annealed	...	55
2	99.2Zr	Smls. fittings	SB-653	PZ-2	R60702	Annealed	...	55
3	99.2Zr	Wld. fittings	SB-653	PZ-2W	R60702	Annealed	...	55
4	99.2Zr	Smls. & wld. pipe	SB-658	...	R60702	Annealed	...	55
(23) 5	95.5Zr + 2.5Nb	Forgings	SB-493	...	R60705	Annealed	...	70
(23) 6	95.5Zr + 2.5Nb	Smls. & wld. tube	SB-523	...	R60705	Annealed	...	80
(23) 7	95.5Zr + 2.5Nb	Bar, wire	SB-550	...	R60705	Annealed	...	80
(23) 8	95.5Zr + 2.5Nb	Plate, sheet, strip	SB-551	...	R60705	Annealed	...	80
(23) 9	95.5Zr + 2.5Nb	Smls. fittings	SB-653	PZ-5	R60705	Annealed	...	80
(23) 10	95.5Zr + 2.5Nb	Wld. fittings	SB-653	PZ-5W	R60705	Annealed	...	80
(23) 11	95.5Zr + 2.5Nb	Smls. & wld. pipe	SB-658	...	R60705	Annealed	...	80

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding														
Line No.	100	200	300	400	500	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)													
1	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...
2	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...
3	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...
4	55.0	47.9	39.0	31.9	26.6	23.1	21.8	20.8	19.9	19.2	...	...	...	...
5	70.0	58.0	48.8	43.5	40.9	39.6	38.9	37.8	35.9	33.0	...	...	...	...
6	80.0	66.3	55.8	49.7	46.8	45.3	44.5	43.2	41.1	37.7	...	...	...	...
7	80.0	66.3	55.8	49.7	46.8	45.3	44.5	43.2	41.1	37.7	...	...	...	...
8	80.0	66.3	55.8	49.7	46.8	45.3	44.5	43.2	41.1	37.7	...	...	...	...
9	80.0	66.3	55.8	49.7	46.8	45.3	44.5	43.2	41.1	37.7	...	...	...	...
10	80.0	66.3	55.8	49.7	46.8	45.3	44.5	43.2	41.1	37.7	...	...	...	...
11	80.0	66.3	55.8	49.7	46.8	45.3	44.5	43.2	41.1	37.7	...	...	...	...

Table U (Cont'd)
Tensile Strength Values, S_u , for Ferrous and Nonferrous Materials

Tensile Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Nonferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...

NOTES TO TABLE U**GENERAL NOTES**

- (a) The following abbreviations are used: ann., annealed; cond., condenser; CW, cold worked; fin., finished; fr., from; ftgs., fittings; HW, Hot worked; N, Normalized; NT, Normalized and tempered; QT, Quenched and tempered; rel., relieved; rld., rolled; Smls., Seamless; Sol., Solution; SR, stress relieved; Str., Strength; treat., treated; and Wld., Welded.
- (b) The tabulated values of tensile strength are those which the Committee believes are suitable for use in design calculations. At temperatures above room temperature, the values of tensile strength tend toward an average or expected value which may be as much as 10% above the tensile strength trend curve adjusted to the minimum specified room temperature tensile strength. The tensile strength values do not correspond exactly to "average" as this term is applied to a statistical treatment of a homogeneous set of data. Neither the ASME Material Specifications nor the rules of Sections I, III, VIII, or XII require elevated temperature testing for tensile strengths of production material for use in Code components. It is not intended that results of such tests, if performed, be compared with these tabulated tensile strength values for ASME Code acceptance/rejection purposes for materials. If some elevated temperature test results on production material appear lower than the tabulated values by a large amount (more than the typical variability of material and suggesting the possibility of some error), further investigation by retest or other means should be considered.
- (c) Notes limiting applications of these materials appear in Tables 1A, 1B, 2A, 2B, 3, 4, 5A, and 5B.
- (d) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-516/SA-516M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-516 Grade 70 shall be used when SA-516M Grade 485 is used in construction.
- (e) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (f) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

Table Y-1
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials						
(23)	1 Carbon steel	Sheet	SA-1008	CS-A	...	...
	2 Carbon steel	Sheet	SA-1008	CS-B	...	...
	3 Carbon steel	Bar	SA-675	45	...	...
	4 Carbon steel	Wld. pipe	SA-134	A283A	...	...
	5 ...	...	...	...	...	...
	6 Carbon steel	Plate	SA-285	A	K01700	...
	7 Carbon steel	Wld. pipe	SA-672	A45	K01700	...
	8 Carbon steel	Sheet	SA-414	A	K01501	...
	9 Carbon steel	Wld. tube	SA-178	A	K01200	...
	10 Carbon steel	Smls. tube	SA-179	...	K01200	...
	11 Carbon steel	Smls. tube	SA-192	...	K01201	...
	12 Carbon steel	Wld. tube	SA-214	...	K01807	...
	13 Carbon steel	Smls. tube	SA-556	A2	K01807	...
	14 Carbon steel	Wld. tube	SA-557	A2	K01807	...
	15 Carbon steel	Wld. pipe	SA-53	E/A	K02504	...
	16 Carbon steel	Smls. pipe	SA-53	S/A	K02504	...
	17 Carbon steel	Smls. pipe	SA-106	A	K02501	...
	18 Carbon steel	Wld. pipe	SA-135	A	...	...
	19 Carbon steel	Forged pipe	SA-369	FPA	K02501	...
	20 Carbon steel	Wld. pipe	SA-587	...	K11500	...
(23)	21 Carbon steel	Bar	SA-675	50	...	...
	22 Carbon steel	Wld. pipe	SA-134	A283B	...	...
	23 ...	...	...	...	...	...
	24 Carbon steel	Plate	SA-285	B	K02200	...
	25 Carbon steel	Wld. pipe	SA-672	A50	K02200	...
	26 Carbon steel	Sheet	SA-414	B	K02201	...
	27 Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...
	28 Carbon steel	Plate	SA/EN 10028-2	P235GH	...	...
	29 Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...
	30 Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...
	31 Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...
	32 Carbon steel	Smls. tube	SA/EN 10216-2	P235GH	...	...
	33 Carbon steel	Sheet, strip	SA-1011	36	SS	Type 1
	34 Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...
	35 Carbon steel	Bar	SA-675	55	...	...
	36 Carbon steel	Wld. pipe	SA-134	A283C	K02401	...
	37 Carbon steel	Plate	SA-283	C	K02401	...
	38 Carbon steel	Plate	SA-285	C	K02801	...
	39 Carbon steel	Smls. & wld. pipe	SA-333	1	K03008	...
	40 Carbon steel	Smls. & wld. tube	SA-334	1	K03008	...
	41 Carbon steel	Plate	SA-516	55	K01800	...
	42 Carbon steel	Smls. pipe	SA-524	II	K02104	...
	43 Carbon steel	Wld. pipe	SA-671	CA55	K02801	...
	44 Carbon steel	Wld. pipe	SA-671	CE55	K02202	...
	45 Carbon steel	Wld. pipe	SA-672	A55	K02801	...

Table Y-1
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials				
1	...	40	20	...
2	...	40	20	...
3	...	45	22.5	...
4	...	45	24	...
5	...	...	...	...
6	...	45	24	...
7	...	45	24	...
8	...	45	25	...
9	...	47	26	...
10	...	47	26	...
11	...	47	26	...
12	...	47	26	...
13	...	47	26	...
14	...	47	26	...
15	...	48	30	...
16	...	48	30	...
17	...	48	30	...
18	...	48	30	...
19	...	48	30	...
20	...	48	30	...
21	...	50	25	...
22	...	50	27	...
23	...	...	...	...
24	...	50	27	...
25	...	50	27	...
26	...	50	30	...
27	$6 < t \leq 10$	51	31	...
28	$\leq 2\frac{1}{4}$	52	31	...
29	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	52	31	...
30	$4 < t \leq 6$	52	32.5	...
31	$\frac{5}{8} < t \leq 1\frac{5}{8}$	52	32.5	...
32	$t \leq \frac{5}{8}$	52	34	...
33	$t \leq 0.23$	53	36	...
34	$2\frac{1}{4} < t \leq 4$	53.5	34	...
35	...	55	27.5	...
36	...	55	30	...
37	...	55	30	...
38	...	55	30	...
39	...	55	30	...
40	...	55	30	...
41	...	55	30	...
42	...	55	30	...
43	...	55	30	...
44	...	55	30	...
45	...	55	30	...

Table Y-1
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials									
1	20.0	18.8	18.3	18.0	17.7	...	17.1	...	16.3
2	20.0	18.8	18.3	18.0	17.7	...	17.1	...	16.3
3	22.5	21.1	20.6	20.2	19.9	...	19.2	...	18.3
4	24.0	22.6	22.0	21.6	21.2	...	20.5	...	19.6
5	...	...	...	...	...	...	...	...	...
6	24.0	22.6	22.0	21.6	21.2	...	20.5	...	19.6
7	24.0	22.6	22.0	21.6	21.2	...	20.5	...	19.6
8	25.0	23.5	22.9	22.5	22.1	...	21.4	...	20.4
9	26.0	24.4	23.8	23.4	23.0	...	22.2	...	21.2
10	26.0	24.4	23.8	23.4	23.0	...	22.2	...	21.2
11	26.0	24.4	23.8	23.4	23.0	...	22.2	...	21.2
12	26.0	24.4	23.8	23.4	23.0	...	22.2	...	21.2
13	26.0	24.4	23.8	23.4	23.0	...	22.2	...	21.2
14	26.0	24.4	23.8	23.4	23.0	...	22.2	...	21.2
15	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
16	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
17	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
18	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
19	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
20	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
21	25.0	23.5	22.9	22.5	22.1	...	21.4	...	20.4
22	27.0	25.4	24.7	24.3	23.9	...	23.1	...	22.0
23	...	...	...	...	...	...	...	...	...
24	27.0	25.4	24.7	24.3	23.9	...	23.1	...	22.0
25	27.0	25.4	24.7	24.3	23.9	...	23.1	...	22.0
26	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
27	31.0	29.3	28.6	...	27.6	...	26.6	...	25.4
28	31.0	...	28.4	...	27.4	...	26.5	...	25.3
29	31.2	29.3	28.6	28.0	27.6	27.1	26.6	26.1	25.4
30	32.5	30.7	29.9	...	28.9	...	27.9	...	26.6
31	32.6	30.7	29.9	29.3	28.9	28.4	27.9	27.3	26.6
32	34.1	32.0	31.2	30.6	30.2	29.7	29.1	28.5	27.8
33	36.0	33.8	33.1	32.4	31.6	31.2	30.8	30.2	29.3
34	34.0	32.0	31.1	...	30.1	...	29.1	...	...
35	27.5	25.8	25.2	24.7	24.3	...	23.5	...	22.4
36	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
37	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
38	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
39	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
40	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
41	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
42	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
43	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
44	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
45	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4

Table Y-1
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
										Ferrous Materials
1	...	15.3	14.8	14.3	13.8	13.4	13.0	12.6	12.3	11.9
2	...	15.3	14.8	14.3	13.8	13.4	13.0	12.6	12.3	11.9
3	...	17.2	16.7	16.1	15.6	15.1	14.6	14.2	13.8	13.4
4	...	18.4	17.8	17.2	16.6	16.1	15.6	15.2	14.7	14.3
5	...	...	...	...	...	...	...	...	...	...
6	...	18.4	17.8	17.2	16.6	16.1	15.6	15.2	14.7	14.3
7	...	18.4	17.8	17.2	16.6	16.1	15.6	15.2	14.7	14.3
8	...	19.2	18.5	17.9	17.3	16.8	16.3	15.8	15.4	14.9
9	...	19.9	19.3	18.6	18.0	17.4	16.9	16.4	16.0	15.5
10	...	19.9	19.3	18.6	18.0	17.4	16.9	16.4	16.0	15.5
11	...	19.9	19.3	18.6	18.0	17.4	16.9	16.4	16.0	15.5
12	...	19.9	19.3	18.6	18.0	17.4	16.9	16.4	16.0	15.5
13	...	19.9	19.3	18.6	18.0	17.4	16.9	16.4	16.0	15.5
14	...	19.9	19.3	18.6	18.0	17.4	16.9	16.4	16.0	15.5
15	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
16	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
17	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
18	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
19	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
20	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
21	...	19.2	18.5	17.9	17.3	16.8	16.3	15.8	15.4	14.9
22	...	20.7	20.0	19.3	18.7	18.1	17.6	17.1	16.6	16.0
23	...	...	...	...	...	...	...	...	...	...
24	...	20.7	20.0	19.3	18.7	18.1	17.6	17.1	16.6	16.0
25	...	20.7	20.0	19.3	18.7	18.1	17.6	17.1	16.6	16.0
26	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
27	...	23.9	23.1	22.3	21.6	20.9	20.3	19.7	19.2	18.5
28	...	23.8	...	22.2	21.5	20.8	20.2	19.6	19.0	18.4
29	24.7	23.9	23.1	22.3	21.6	20.9	20.3	19.7	19.2	18.5
30	...	25.0	24.2	23.4	22.6	21.9	21.2	20.6	20.0	19.4
31	25.8	25.0	24.2	23.4	22.6	21.9	21.2	20.6	20.0	19.4
32	27.0	26.1	25.3	24.4	23.6	22.8	22.2	21.5	20.9	20.3
33	28.3	27.7	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	21.1	20.4	19.7	19.0	18.4	17.9	17.4	16.9	16.3
36	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
37	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
38	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
39	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
40	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
41	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
42	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
43	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
44	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
45	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8

Table Y-1
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Carbon steel	Wld. pipe	SA-672	B55	K02001	...
2	Carbon steel	Wld. pipe	SA-672	C55	K01800	...
3	Carbon steel	Wld. pipe	SA-672	E55	K02202	...
4	Carbon steel	Sheet	SA-414	C	K02503	...
5	Carbon steel	Sheet, strip	SA-1011	40	SS	...
6	Carbon steel	Sheet, strip	SA-1011	45	HSLAS	2
7	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...
8	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...
9	Carbon steel	Plate	SA/EN 10028-3	P275NH	...	...
10	Carbon steel	Plate, sheet, bar	SA-36	...	K02600	...
11	Carbon steel	Plate, sheet	SA-662	A	K01701	...
12	Carbon steel	Sheet, strip	SA-1011	36	SS	Type 2
13	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...
14	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...
(23) 15	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...
16	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...
17	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...
18	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...
(23) 19	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...
20	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...
21	Carbon steel	Plate	SA/EN 10028-2	P265GH	...	...
22	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...
23	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250A	...	...
24	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250BR	...	...
(23) 25	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250 B0	...	...
26	Carbon steel	Plate, bar, shapes	SA/IS 2062	E250C	...	...
27	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...
28	Carbon steel	Smls. tube	SA/EN 10216-2	P265GH	...	...
29	Carbon steel	Forgings	SA-181	...	K03502	60
30	Carbon steel	Castings	SA-216	WCA	J02502	...
31	Carbon steel	Forgings	SA-266	1	K03506	...
32	Carbon steel	Forgings	SA-350	LF1	K03009	1
33	Carbon steel	Castings	SA-352	LCA	J02504	...
34	Carbon steel	Cast pipe	SA-660	WCA	J02504	...
35	Carbon steel	Bar	SA-675	60	...	...
36	Carbon steel	Forgings	SA-765	I	K03046	...
37	Carbon steel	Plate	SA-515	60	K02401	...
38	Carbon steel	Plate	SA-516	60	K02100	...
39	Carbon steel	Wld. pipe	SA-671	CB60	K02401	...
40	Carbon steel	Wld. pipe	SA-671	CC60	K02100	...
41	Carbon steel	Wld. pipe	SA-671	CE60	K02402	...
42	Carbon steel	Wld. pipe	SA-672	B60	K02401	...
43	Carbon steel	Wld. pipe	SA-672	C60	K02100	...
44	Carbon steel	Wld. pipe	SA-672	E60	K02402	...
45	Carbon steel	Wld. pipe	SA-134	A283D	K02702	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	55	30	...
2	...	55	30	...
3	...	55	30	...
4	...	55	33	...
5	$t \leq 0.23$	55	40	...
6	...	55	45	...
7	$1\frac{1}{2} < t \leq 2\frac{1}{4}$	56.5	37	...
8	$\frac{5}{8} < t \leq 1\frac{1}{2}$	56.5	38.5	...
9	$\leq \frac{5}{8}$	56.5	40	...
10	...	58	36	...
11	...	58	40	...
12	$t \leq 0.23$	58	36	...
13	$t > 1\frac{1}{2}$	59.5	33.4	...
14	$t > 1\frac{1}{2}$	59.5	33.4	...
15	$t > 1\frac{1}{2}$	59.5	33.4	...
16	$t > 1\frac{1}{2}$	59.5	33.4	...
17	$\frac{3}{4} < t \leq 1\frac{1}{2}$	59.5	34.8	...
18	$\frac{3}{4} < t \leq 1\frac{1}{2}$	59.5	34.8	...
19	$\frac{3}{4} < t \leq 1\frac{1}{2}$	59.5	34.8	...
20	$\frac{3}{4} < t \leq 1\frac{1}{2}$	59.5	34.8	...
21	$\leq 2\frac{1}{4}$	59.5	35.5	...
22	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	59.5	35.5	...
23	$\leq \frac{3}{4}$	59.5	36.3	...
24	$\leq \frac{3}{4}$	59.5	36.3	...
25	$\leq \frac{3}{4}$	59.5	36.3	...
26	$\leq \frac{3}{4}$	59.5	36.3	...
27	$\frac{5}{8} < t \leq 1\frac{5}{8}$	59.5	37	...
28	$t \leq \frac{5}{8}$	59.5	38.5	...
29	...	60	30	...
30	...	60	30	...
31	...	60	30	...
32	...	60	30	...
33	...	60	30	...
34	...	60	30	...
35	...	60	30	...
36	...	60	30	...
37	...	60	32	...
38	...	60	32	...
39	...	60	32	...
40	...	60	32	...
41	...	60	32	...
42	...	60	32	...
43	...	60	32	...
44	...	60	32	...
45	...	60	33	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
2	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
3	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
4	33.0	31.0	30.2	29.7	29.2	...	28.2	...	26.9
5	40.0	37.6	36.6	36.0	35.4	34.6	34.2	33.6	32.6
6	45.0	42.3	41.4	40.4	39.5	38.9	38.5	37.7	36.7
7	37.0	34.7	33.9	...	32.7	...	31.6	...	30.1
8	38.5	36.2	35.3	...	34.1	...	32.9	...	31.3
9	40.0	37.4	36.5	...	35.3	...	34.1	...	32.5
10	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
11	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
12	36.0	33.8	33.1	32.4	31.6	31.2	30.8	30.2	29.3
13	33.4	...	30.5	...	29.5	...	28.5	...	27.2
14	33.4	...	30.5	...	29.5	...	28.5	...	27.2
15	33.4	...	30.5	...	29.5	...	28.5	...	27.2
16	33.4	...	30.5	...	29.5	...	28.5	...	27.2
17	34.8	...	31.8	...	30.8	...	29.8	...	28.4
18	34.8	...	31.8	...	30.8	...	29.8	...	28.4
19	34.8	...	31.8	...	30.8	...	29.8	...	28.4
20	34.8	...	31.8	...	30.8	...	29.8	...	28.4
21	35.5	...	32.5	...	31.4	...	30.3	...	28.9
22	35.5	33.4	32.6	31.9	31.4	30.9	30.4	29.7	29.0
23	36.3	...	33.1	...	32.1	...	31.0	...	29.6
24	36.3	...	33.1	...	32.1	...	31.0	...	29.6
25	36.3	...	33.1	...	32.1	...	31.0	...	29.6
26	36.3	...	33.1	...	32.1	...	31.0	...	29.6
27	37.0	34.8	33.9	33.3	32.7	32.2	31.6	30.9	30.1
28	38.4	36.1	35.2	34.6	34.0	33.5	32.8	32.1	31.3
29	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
30	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
31	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
32	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
33	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
34	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
35	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
36	30.0	28.2	27.5	27.0	26.5	...	25.6	...	24.4
37	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
38	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
39	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
40	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
41	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
42	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
43	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
44	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
45	33.0	31.0	30.2	29.7	29.2	...	28.2	...	26.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
2	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
3	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
4	...	25.3	24.5	23.6	22.8	22.1	21.5	20.9	20.3	19.6
5	31.4	30.7	...	...	...	...	...	...	...	...
6	35.4	34.6	...	...	...	...	...	...	...	...
7	...	28.3	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
8	...	29.5	28.5	27.5	26.6	25.8	25.0	24.3	23.6	22.9
9	...	30.6	29.6	28.6	27.6	26.7	25.9	25.2	24.5	23.7
10	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
11	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
12	28.3	27.7	...	...	...	...	...	...	...	...
13	...	25.6	24.7	23.8	...	...	...	...	...	...
14	...	25.6	24.7	23.8	...	...	...	...	...	...
15	...	25.6	24.7	23.8	...	...	...	...	...	...
16	...	25.6	24.7	23.8	...	...	...	...	...	...
17	...	26.7	25.8	24.9	...	...	...	...	...	...
18	...	26.7	25.8	24.9	...	...	...	...	...	...
19	...	26.7	25.8	24.9	...	...	...	...	...	...
20	...	26.7	25.8	24.9	...	...	...	...	...	...
21	...	27.2	26.3	25.4	24.6	23.8	23.1	22.4	21.8	21.1
22	28.1	27.2	26.3	25.4	24.6	23.8	23.1	22.5	21.8	21.1
23	...	27.8	26.8	25.9	...	...	...	...	...	...
24	...	27.8	26.8	25.9	...	...	...	...	...	...
25	...	27.8	26.8	25.9	...	...	...	...	...	...
26	...	27.8	26.8	25.9	...	...	...	...	...	...
27	29.3	28.4	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
28	30.4	29.5	28.5	27.5	26.6	25.8	25.0	24.3	23.6	22.8
29	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
30	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
31	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
32	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
33	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
34	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
35	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
36	...	23.0	22.2	21.5	20.8	20.1	19.5	19.0	18.4	17.8
37	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
38	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
39	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
40	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
41	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
42	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
43	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
44	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
45	...	25.3	24.5	23.6	22.8	22.1	21.5	20.9	20.3	19.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Carbon steel	Plate	SA-283	D	K02702	...
2	Carbon steel	Wld. pipe	SA-53	E/B	K03005	...
3	Carbon steel	Smls. pipe	SA-53	S/B	K03005	...
4	Carbon steel	Smls. pipe	SA-106	B	K03006	...
5	Carbon steel	Wld. pipe	SA-135	B	...	...
6	Carbon steel	Smls. & wld. fittings	SA-234	WPB	K03006	...
7	Carbon steel	Smls. & wld. pipe	SA-333	6	K03006	...
8	Carbon steel	Smls. & wld. tube	SA-334	6	K03006	...
9	Carbon steel	Forged pipe	SA-369	FPB	K03006	...
10	Carbon steel	Forgings	SA-372	A	K03002	...
11	Carbon steel	Sheet	SA-414	D	K02505	...
12	Carbon steel	Smls. & wld. fittings	SA-420	WPL6	...	...
13	Carbon steel	Smls. pipe	SA-524	I	K02104	...
14	Carbon steel	Bar	SA-696	B	K03200	...
15	Carbon steel	Bolting	SA-307	A	...	...
16	Carbon steel	Bolting	SA-307	B	...	...
17	Carbon steel	Forgings	SA-727	...	K02506	...
18	Carbon steel	Wld. tube	SA-178	C	K03503	...
19	Carbon steel	Smls. tube	SA-210	A-1	K02707	...
20	Carbon steel	Smls. tube	SA-556	B2	K02707	...
21	Carbon steel	Wld. tube	SA-557	B2	K03007	...
22	Carbon steel	Plate, bar	SA/CSA-G40.21	38W	...	...
23	Carbon steel	Plate, sheet, bar	SA-572	42	...	...
24	Carbon steel	Sheet, strip	SA-1011	45	HSLAS	1
25	Carbon steel	Sheet, strip	SA-1011	45	SS	...
26	Carbon steel	Sheet, strip	SA-1011	50	HSLAS	2
27	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...
28	Carbon steel	Plate	SA/AS 1548	PT430	...	...
29	Carbon steel	Plate	SA/AS 1548	PT430	...	...
30	Carbon steel	Plate	SA/AS 1548	PT430	...	...
31	Carbon steel	Plate	SA/AS 1548	PT430	...	...
32	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...
33	Carbon steel	Bar	SA-675	65	...	...
34	Carbon steel	Castings	SA-352	LCB	J03003	...
35	Carbon steel	Plate	SA-515	65	K02800	...
36	Carbon steel	Plate	SA-516	65	K02403	...
37	Carbon steel	Wld. pipe	SA-671	CB65	K02800	...
38	Carbon steel	Wld. pipe	SA-671	CC65	K02403	...
39	Carbon steel	Wld. pipe	SA-672	B65	K02800	...
40	Carbon steel	Wld. pipe	SA-672	C65	K02403	...
41	Carbon steel	Sheet	SA-414	E	K02704	...
42	Carbon steel	Plate	SA-662	B	K02203	...
43	Carbon steel	Plate, bar	SA/CSA-G40.21	44W	...	...
44	Carbon steel	Plate, bar	SA/CSA-G40.21	44W	...	...
45	Carbon steel	Plate	SA-537	...	K12437	1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	60	33	...
2	...	60	35	...
3	...	60	35	...
4	...	60	35	...
5	...	60	35	...
6	...	60	35	...
7	...	60	35	...
8	...	60	35	...
9	...	60	35	...
10	...	60	35	...
11	...	60	35	...
12	...	60	35	...
13	...	60	35	...
14	...	60	35	...
15	$\frac{1}{4} \leq t \leq 4$	60	36	...
16	...	60	36	...
17	...	60	36	...
18	...	60	37	...
19	...	60	37	...
20	...	60	37	...
21	...	60	37	...
22	...	60	38	...
23	$t \leq 6$	60	42	...
24	...	60	45	...
25	$t \leq 0.23$	60	45	...
26	...	60	50	...
27	$6 < t \leq 10$	62.5	32	...
28	$3\frac{1}{4} < t \leq 6$	62.5	36.5	...
29	$1\frac{1}{2} < t \leq 3\frac{1}{4}$	62.5	39	...
30	$\frac{5}{8} < t \leq 1\frac{1}{2}$	62.5	40.5	...
31	$\leq \frac{5}{8}$	62.5	43.5	...
32	$4 < t \leq 6$	64	34	...
33	...	65	32.5	...
34	...	65	35	...
35	...	65	35	...
36	...	65	35	...
37	...	65	35	...
38	...	65	35	...
39	...	65	35	...
40	...	65	35	...
41	...	65	38	...
42	...	65	40	...
43	$2\frac{1}{2} < t \leq 8$	65	40	...
44	$t \leq 2\frac{1}{2}$	65	44	...
45	$2\frac{1}{2} < t \leq 4$	65	45	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	33.0	31.0	30.2	29.7	29.2	...	28.2	...	26.9
2	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
3	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
4	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
5	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
6	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
7	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
8	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
9	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
10	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
11	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
12	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
13	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
14	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
15	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
16	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
17	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
18	37.0	34.8	33.9	33.3	32.7	...	31.6	...	30.2
19	37.0	34.8	33.9	33.3	32.7	...	31.6	...	30.2
20	37.0	34.8	33.9	33.3	32.7	...	31.6	...	30.2
21	37.0	34.8	33.9	33.3	32.7	...	31.6	...	30.2
22	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
23	42.0	39.5	38.5	37.8	37.2	36.4	35.9	35.2	34.2
24	45.0	42.3	41.3	40.5	39.9	39.0	38.5	37.8	36.7
25	45.0	42.3	41.3	40.5	39.9	39.0	38.5	37.8	36.7
26	50.0	46.3	44.2	42.2	40.5	39.1	37.6	36.5	35.4
27	32.0	30.1	29.3	28.8	28.3	...	27.3	...	26.1
28	36.5	...	33.4	...	32.3	...	31.2	...	29.7
29	39.0	...	35.7	...	34.5	...	33.3	...	31.8
30	40.5	...	37.1	...	35.8	...	34.6	...	33.0
31	43.5	...	39.9	...	38.5	...	37.2	...	35.4
32	34.0	32.0	31.1	30.6	30.1	...	29.1	...	27.7
33	32.5	30.5	29.8	29.2	28.8	...	27.8	...	26.5
34	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
35	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
36	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
37	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
38	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
39	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
40	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
41	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
42	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
43	40.0	37.8	36.8	36.1	35.4	34.8	34.1	...	32.5
44	44.0	41.6	40.5	39.7	39.0	38.2	37.5	...	35.8
45	45.0	42.3	41.2	40.5	39.8	...	38.4	...	36.7

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	25.3	24.5	23.6	22.8	22.1	21.5	20.9	20.3	19.6
2	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
3	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
4	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
5	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
6	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
7	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
8	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
9	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
10	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
11	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
12	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
13	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
14	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
15	...	27.6	26.7	25.8	...	...	...	...	...	...
16	...	27.6	26.7	25.8	...	...	...	...	...	...
17	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
18	...	28.4	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
19	...	28.4	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
20	...	28.4	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
21	...	28.4	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
22	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	21.4
23	33.0	32.2	...	...	...	...	...	...	...	...
24	35.4	34.5	...	...	...	...	...	...	...	...
25	35.4	34.5	...	...	...	...	...	...	...	...
26	34.6	33.7	...	...	...	...	...	...	...	...
27	...	24.5	23.7	22.9	22.2	21.5	20.8	20.2	19.7	19.0
28	...	28.0	27.1	26.1	25.3	24.5	23.7	23.1	22.4	21.7
29	...	29.9	28.9	27.9	27.0	26.1	25.4	24.7	24.0	23.2
30	...	31.0	30.0	29.0	28.0	27.1	26.3	25.6	24.9	24.1
31	...	33.3	32.2	31.1	30.1	29.2	28.3	27.5	26.7	25.9
32	...	26.1	25.2	24.3	23.5	22.8	22.1	21.5	20.9	20.2
33	...	24.9	24.1	23.3	22.5	21.8	21.1	20.5	20.0	19.3
34	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
35	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
36	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
37	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
38	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
39	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
40	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
41	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
42	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
43	31.6	30.7	29.7	28.7	27.7	26.8	26.0	25.2	24.5	23.8
44	34.8	33.7	32.7	31.6	30.5	29.5	28.6	27.7	26.9	26.2
45	...	34.5	33.4	32.2	31.2	30.2	29.3	28.4	27.6	26.7

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...
2	Carbon steel	Plate, bar	SA/CSA-G40.21	50W	...	...
3	Carbon steel	Plate, bar	SA/CSA-G40.21	50W	...	...
4	Carbon steel	Plate, sheet, bar	SA-572	50	...	...
5	Carbon steel	Round bar	SA-572	50	...	...
6	Carbon steel	Sheet, strip	SA-1011	50	SS	...
7	Carbon steel	Sheet, strip	SA-1011	50	HSLAS	1
8	Carbon steel	Sheet, strip	SA-1011	55	HSLAS	2
9	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	NT or QT
10	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...
11	Carbon steel	Plate	SA/AS 1548	PT460	...	...
12	Carbon steel	Plate	SA/AS 1548	PT460	...	...
13	Carbon steel	Forgings	SA/EN 10222-2	P280GH	...	Normalized
14	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...
15	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...
16	Carbon steel	Plate	SA/AS 1548	PT460	...	...
17	Carbon steel	Plate	SA/EN 10028-2	P295GH	...	...
18	Carbon steel	Plate	SA/AS 1548	PT460	...	...
19	Carbon steel	Plate	SA/GB 713	Q345R	...	...
20	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...
21	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...
22	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...
23	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...
24	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...
25	Carbon steel	Plate	SA/GB 713	Q345R	...	...
26	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...
27	Carbon steel	Plate	SA-455	...	K03300	...
28	Carbon steel	Bar	SA-675	70	...	...
29	Carbon steel	Forgings	SA-105	...	K03504	...
30	Carbon steel	Forgings	SA-181	...	K03502	70
31	Carbon steel	Castings	SA-216	WCB	J03002	...
32	Carbon steel	Forgings	SA-266	2	K03506	...
33	Carbon steel	Forgings	SA-266	4	K03017	...
34	Carbon steel	Forgings	SA-350	LF2	K03011	...
35	Carbon steel	Forgings	SA-508	1	K13502	...
36	Carbon steel	Forgings	SA-508	1A	K13502	...
37	Carbon steel	Forgings	SA-541	1	K03506	...
38	Carbon steel	Forgings	SA-541	1A	K03020	...
39	Carbon steel	Cast pipe	SA-660	WCB	J03003	...
40	Carbon steel	Forgings	SA-765	II	K03047	...
41	Carbon steel	Plate	SA-515	70	K03101	...
42	Carbon steel	Plate	SA-516	70	K02700	...
43	Carbon steel	Wld. pipe	SA-671	CB70	K03101	...
44	Carbon steel	Wld. pipe	SA-671	CC70	K02700	...
45	Carbon steel	Wld. pipe	SA-672	B70	K03101	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	$2\frac{1}{2} < t \leq 4$	65	45	...
2	$2\frac{1}{2} < t \leq 6$	65	46	...
3	$t \leq 2\frac{1}{2}$	65	50	...
4	$t \leq 4$	65	50	...
5	$t \leq 11$	65	50	...
6	$t \leq 0.23$	65	50	...
7	...	65	50	...
8	...	65	55	...
9	$1.4 < t \leq 6.3$	66.5	37	...
10	$2\frac{1}{4} < t \leq 4$	66.5	37.5	...
11	$3\frac{1}{4} < t \leq 6$	66.5	38.5	...
12	$1\frac{1}{2} < t \leq 3\frac{1}{4}$	66.5	40	...
13	$t \leq 1.4$	66.5	40.5	...
14	$1\frac{1}{2} < t \leq 2\frac{1}{4}$	66.5	41.5	...
15	$\frac{5}{8} < t \leq 1\frac{1}{2}$	66.5	42	...
16	$\frac{5}{8} < t \leq 1\frac{1}{2}$	66.5	43	...
17	$\leq \frac{5}{8}$	66.5	43	...
18	$\leq \frac{5}{8}$	66.5	44	...
19	$6 < t \leq 10$	68	38.5	...
20	$6 < t \leq 10$	68	40.5	...
21	$2.48 < t \leq 3.15$	68	47	...
22	$1.57 < t \leq 2.48$	68	48.5	...
23	$0.63 < t \leq 1.57$	68	50	...
24	$0.12 \leq t \leq 0.63$	68	51.5	...
25	$4 < t \leq 6$	69.5	41.5	...
26	$4 < t \leq 6$	69.5	43	...
27	$0.58 < t \leq \frac{3}{4}$	70	35	...
28	...	70	35	...
29	...	70	36	...
30	...	70	36	...
31	...	70	36	...
32	...	70	36	...
33	...	70	36	...
34	...	70	36	...
35	...	70	36	...
36	...	70	36	...
37	...	70	36	...
38	...	70	36	...
39	...	70	36	...
40	...	70	36	...
41	...	70	38	...
42	...	70	38	...
43	...	70	38	...
44	...	70	38	...
45	...	70	38	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	45.0	42.3	41.2	40.5	39.8	...	38.4	...	36.7
2	46.0	43.4	42.4	41.5	40.7	40.0	39.2	...	37.4
3	50.0	47.2	46.0	45.1	44.3	43.5	42.6	...	40.6
4	50.0	46.3	44.2	42.2	40.5	39.1	37.6	36.5	35.4
5	50.0	46.3	44.2	42.2	40.5	39.1	37.6	36.5	35.4
6	50.0	46.3	44.2	42.2	40.5	39.1	37.6	36.5	35.4
7	50.0	46.3	44.2	42.2	40.5	39.1	37.6	36.5	35.4
8	55.0	51.0	48.6	46.4	44.5	42.8	41.3	40.2	38.9
9	37.0	34.6	33.7	33.0	32.5	32.0	31.4	...	29.9
10	37.5	35.2	34.4	33.7	33.2	...	32.0	...	30.6
11	38.5	...	35.3	...	34.1	...	32.9	...	31.4
12	40.0	...	36.6	...	35.4	...	34.2	...	32.6
13	40.6	38.0	37.0	36.3	35.7	35.1	34.4	...	32.9
14	41.5	39.0	38.0	37.3	36.7	...	35.5	...	33.8
15	42.0	39.5	38.5	37.8	37.2	...	35.9	...	34.2
16	43.0	...	39.4	...	38.0	...	36.7	...	35.0
17	43.0	40.4	39.4	38.7	38.0	...	36.7	...	35.0
18	44.0	...	40.3	...	38.9	...	37.6	...	35.9
19	38.4	36.1	35.2	34.6	34.1	33.5	32.9	...	31.4
20	40.6	...	37.1	...	35.9	...	34.7	...	33.1
21	47.1	...	...	...	...	...	...	...	...
22	48.6	...	...	...	...	...	...	...	...
23	50.0	...	...	...	...	...	...	...	...
24	51.5	...	...	...	...	...	...	...	...
25	41.3	38.8	37.9	37.2	36.6	36.0	35.4	34.5	33.7
26	42.8	...	39.1	...	37.9	...	36.6	...	34.9
27	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
28	35.0	32.9	32.1	31.5	31.0	...	29.9	...	28.5
29	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
30	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
31	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
32	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
33	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
34	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
35	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
36	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
37	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
38	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
39	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
40	36.0	33.8	33.0	32.4	31.8	...	30.8	...	29.3
41	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
42	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
43	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
44	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
45	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	34.5	33.4	32.2	31.2	30.2	29.3	28.4	27.6	26.7
2	36.4	35.3	34.1	33.0	31.9	30.9	29.9	29.0	28.2	27.4
3	39.5	38.3	37.1	35.9	34.7	33.5	32.5	31.5	30.6	29.8
4	34.6	33.7	...	...	...	...	...	...	...	...
5	34.6	33.7	...	...	...	...	...	...	...	...
6	34.6	33.7	...	...	...	...	...	...	...	...
7	34.6	33.7	...	...	...	...	...	...	...	...
8	37.8	37.1	...	...	...	...	...	...	...	...
9	29.1	28.2	27.2	26.3	25.4	24.6	23.8	23.2	22.5	21.9
10	...	28.7	27.8	26.9	26.0	25.1	24.4	23.7	23.0	22.3
11	...	29.5	28.5	27.6	26.7	25.8	25.0	24.3	23.6	22.9
12	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
13	31.9	30.9	29.9	28.9	27.9	27.0	26.2	25.4	24.8	24.1
14	...	31.8	30.8	29.7	28.7	27.8	27.0	26.2	25.5	24.7
15	...	32.2	31.1	30.1	29.1	28.2	27.3	26.5	25.8	25.0
16	...	33.0	31.9	30.8	29.8	28.8	28.0	27.2	26.4	25.6
17	...	33.0	31.9	30.8	29.8	28.8	28.0	27.2	26.4	25.6
18	...	33.7	32.6	31.5	30.5	29.5	28.6	27.8	27.0	26.2
19	30.5	29.5	28.5	27.5	26.6	25.8	25.0	24.3	23.6	22.8
20	...	31.1	30.1	29.0	28.1	27.2	26.4	25.7	25.0	24.2
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	32.7	31.7	30.7	29.6	28.6	27.7	26.9	26.1	25.3	24.5
26	...	32.8	31.7	30.6	29.6	28.6	27.8	27.0	26.3	25.5
27	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
28	...	26.8	25.9	25.1	24.2	23.5	22.8	22.1	21.5	20.8
29	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
30	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
31	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
32	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
33	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
34	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
35	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
36	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
37	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
38	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
39	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
40	...	27.6	26.7	25.8	24.9	24.1	23.4	22.8	22.1	21.4
41	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
42	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
43	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
44	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
45	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Carbon steel	Wld. pipe	SA-672	C70	K02700	...
2	Carbon steel	Smls. pipe	SA-106	C	K03501	...
3	Carbon steel	Wld. tube	SA-178	D	...	...
4	Carbon steel	Smls. tube	SA-210	C	K03501	...
5	Carbon steel	Castings	SA-216	WCC	J02503	...
6	Carbon steel	Smls. & wld. fittings	SA-234	WPC	K03501	...
7	Carbon steel	Castings	SA-352	LCC	J02505	...
8	Carbon steel	Castings	SA-487	16	...	...
9	Carbon steel	Plate	SA-537	...	K12437	3
10	Carbon steel	Smls. tube	SA-556	C2	K03006	...
11	Carbon steel	Tube	SA-557	C2	K03505	...
12	Carbon steel	Cast pipe	SA-660	WCC	J02505	...
13	Carbon steel	Bar	SA-696	C	K03200	...
14	Carbon steel	Sheet	SA-414	F	K03102	...
15	Carbon steel	Plate	SA-662	C	K02007	...
16	Carbon steel	Plate	SA-537	...	K12437	2
17	Carbon steel	Plate	SA-738	C	K02008	...
18	Carbon steel	Plate	SA-537	...	K12437	1
19	Carbon steel	Wld. pipe	SA-671	CD70	K12437	...
20	Carbon steel	Wld. pipe	SA-672	D70	K12437	...
21	Carbon steel	Wld. pipe	SA-691	CMSH-70	K12437	...
22	Carbon steel	Plate	SA-841	A	...	1
23	Carbon steel	Plate, sheet, bar	SA-572	55	...	...
24	Carbon steel	Round bar	SA-572	55	...	...
25	Carbon steel	Sheet, strip	SA-1011	55	HSLAS	1
26	Carbon steel	Sheet, strip	SA-1011	60	HSLAS	2
27	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	NT
28	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	Normalized
29	Carbon steel	Plate	SA/GB 713	Q345R	...	...
30	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...
31	Carbon steel	Plate	SA/GB 713	Q345R	...	...
32	Carbon steel	Plate	SA/GB 713	Q345R	...	...
33	Carbon steel	Plate	SA-455	...	K03300	...
34	Carbon steel	Forgings	SA/EN 10222-2	P305GH	...	QT
35	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...
36	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...
37	Carbon steel	Plate	SA/GB 713	Q345R	...	...
38	Carbon steel	Plate	SA/EN 10025-2	S355J2+N	...	...
39	Carbon steel	Plate	SA/EN 10028-2	P355GH	...	...
40	Carbon steel	Forgings	SA-266	3	K05001	...
41	Carbon steel	Plate	SA-455	...	K03300	...
42	Carbon steel	Plate	SA-299	A	K02803	...
43	Carbon steel	Wld. pipe	SA-671	CK75	K02803	...
44	Carbon steel	Wld. pipe	SA-672	N75	K02803	...
45	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	70	38	...
2	...	70	40	...
3	...	70	40	...
4	...	70	40	...
5	...	70	40	...
6	...	70	40	...
7	...	70	40	...
8	...	70	40	...
9	$4 < t \leq 6$	70	40	...
10	...	70	40	...
11	...	70	40	...
12	...	70	40	...
13	...	70	40	...
14	...	70	42	...
15	...	70	43	...
16	$4 < t \leq 6$	70	46	...
17	$4 < t \leq 6$	70	46	...
18	$\leq 2\frac{1}{2}$	70	50	...
19	$\leq 2\frac{1}{2}$	70	50	...
20	$\leq 2\frac{1}{2}$	70	50	...
21	$\leq 2\frac{1}{2}$	70	50	...
22	≤ 4	70	50	...
23	$t \leq 2$	70	55	...
24	$t \leq 3\frac{1}{2}$	70	55	...
25	...	70	55	...
26	...	70	60	...
27	$1.4 < t \leq 6.3$	71	40.5	...
28	$t \leq 1.4$	71	44	...
29	$2\frac{1}{4} < t \leq 4$	71	44	...
30	$2.5 < t \leq 4$	71	45.5	...
31	$1.5 < t \leq 2\frac{1}{4}$	71	45.5	...
32	$\frac{5}{8} < t \leq 1.5$	72.5	47	...
33	$\frac{3}{8} < t \leq \frac{5}{8}$	73	37	...
34	$t \leq 2.8$	74	41.5	...
35	$1.5 < t \leq 2.5$	74	48.5	...
36	$\frac{5}{8} < t \leq 1.5$	74	50	...
37	$\frac{1}{8} \leq t \leq \frac{5}{8}$	74	50	...
38	$t < 0.12$	74	51.5	...
39	$\leq \frac{5}{8}$	74	51.5	...
40	...	75	37.5	...
41	$\leq \frac{3}{8}$	75	38	...
42	> 1	75	40	...
43	> 1	75	40	...
44	> 1	75	40	...
45	> 1	75	40	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
2	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
3	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
4	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
5	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
6	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
7	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
8	40.0	37.2	35.7	34.4	33.4	...	31.8	...	30.5
9	40.0	37.1	35.3	33.8	32.4	...	30.0	...	28.3
10	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
11	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
12	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
13	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
14	42.0	39.5	38.5	37.8	37.2	...	35.9	...	34.2
15	43.0	40.4	39.4	38.7	38.0	...	36.7	...	35.0
16	46.0	42.6	40.6	38.8	37.2	...	34.6	...	32.5
17	46.0	42.6	40.6	38.8	37.2	...	34.6	...	32.5
18	50.0	46.3	44.2	42.2	40.5	...	37.6	...	35.4
19	50.0	46.3	44.2	42.2	40.5	...	37.6	...	35.4
20	50.0	46.3	44.2	42.2	40.5	...	37.6	...	35.4
21	50.0	46.3	44.2	42.2	40.5	...	37.6	...	35.4
22	50.0	...	46.1	...	43.8	...	42.3	...	41.3
23	55.0	51.0	48.6	46.4	44.5	42.8	41.3	40.2	38.9
24	55.0	51.0	48.6	46.4	44.5	42.8	41.3	40.2	38.9
25	55.0	51.0	48.6	46.4	44.5	42.8	41.3	40.2	38.9
26	60.0	55.8	53.0	50.7	48.6	46.6	45.1	43.9	42.4
27	40.6	38.0	37.0	36.3	35.7	35.1	34.4	...	32.9
28	44.2	41.4	40.3	39.5	38.9	38.2	37.5	...	35.8
29	44.2	41.5	40.6	39.8	39.2	38.6	37.8	37.0	36.1
30	45.7	...	41.7	...	40.4	...	39.1	...	37.3
31	45.7	42.9	41.9	41.1	40.5	39.8	39.1	38.2	37.3
32	47.1	44.3	43.2	42.4	41.8	41.1	40.3	39.4	38.5
33	37.0	34.8	33.9	33.3	32.7	...	31.6	...	30.2
34	41.3	38.7	37.7	36.9	36.3	35.7	35.1	...	33.4
35	48.6	...	44.4	...	43.0	...	41.6	...	39.6
36	50.0	...	45.7	...	44.3	...	42.8	...	40.8
37	50.0	47.0	45.9	45.0	44.3	43.6	42.8	41.9	40.8
38	51.5	...	...	...	...	...	...	...	...
39	51.5	...	47.0	...	45.6	...	44.1	...	42.0
40	37.5	35.2	34.4	33.7	33.2	...	32.0	...	30.6
41	38.0	35.7	34.8	34.2	33.6	...	32.5	...	31.0
42	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
43	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
44	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6
45	40.0	37.6	36.6	36.0	35.4	...	34.2	...	32.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
2	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
3	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
4	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
5	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
6	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
7	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
8	...	29.3	28.7	28.0	27.1	26.2	...	...	...	...
9	...	27.0	26.4	25.8	25.2	24.4	...	...	...	...
10	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
11	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
12	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
13	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
14	...	32.2	31.1	30.1	29.1	28.2	27.3	26.5	25.8	25.0
15	...	33.0	31.9	30.8	29.8	28.8	28.0	27.2	26.4	25.6
16	...	31.0	30.3	29.7	28.9	28.1	...	...	...	...
17	...	31.0	30.3	29.7	28.9	28.1	...	...	...	...
18	...	33.7	33.0	32.3	31.5	30.5	...	...	...	...
19	...	33.7	33.0	32.3	31.5	30.5	...	...	...	...
20	...	33.7	33.0	32.3	31.5	30.5	...	...	...	...
21	...	33.7	33.0	32.3	31.5	30.5	...	...	...	...
22	...	40.1	39.3	38.1	36.7	34.9	...	...	...	...
23	37.8	37.1	...	...	...	...	...	...	...	...
24	37.8	37.1	...	...	...	...	...	...	...	...
25	37.8	37.1	...	...	...	...	...	...	...	...
26	41.2	40.5	...	...	...	...	...	...	...	...
27	31.9	30.9	29.9	28.9	27.9	27.0	26.2	25.4	24.8	24.1
28	34.8	33.7	32.6	31.4	30.4	29.4	28.5	27.7	27.0	26.2
29	35.0	33.9	32.8	31.7	30.6	29.7	28.8	27.9	27.1	26.2
30	...	35.0	33.8	32.7	31.6	30.6	29.7	28.9	28.1	27.2
31	36.2	35.1	33.9	32.7	31.6	30.6	29.7	28.8	28.0	27.1
32	37.3	36.2	35.0	33.8	32.6	31.6	30.6	29.8	28.9	28.0
33	...	28.4	27.4	26.5	25.6	24.8	24.1	23.4	22.7	22.0
34	32.5	31.5	30.4	29.4	28.4	27.5	26.6	25.9	25.2	24.5
35	...	37.2	36.0	34.7	33.6	32.5	31.6	30.7	29.9	28.9
36	...	38.3	37.0	35.8	34.6	33.5	32.5	31.6	30.8	29.8
37	39.6	38.4	37.1	35.9	34.7	33.5	32.5	31.6	30.7	29.7
38	...	...	...	...	...	...	...	...	...	...
39	...	39.4	38.1	36.8	35.6	34.5	33.5	32.5	31.6	30.6
40	...	28.7	27.8	26.9	26.0	25.1	24.4	23.7	23.0	22.3
41	...	29.1	28.2	27.2	26.3	25.5	24.7	24.0	23.3	22.6
42	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
43	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
44	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8
45	...	30.7	29.6	28.6	27.7	26.8	26.0	25.3	24.6	23.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Carbon steel	Plate	SA-299	A	K02803	...
2	Carbon steel	Wld. pipe	SA-691	CMS-75	K02803	...
3	Carbon steel	Forgings	SA-372	B	K04001	...
4	Carbon steel	Sheet	SA-414	G	K03103	...
5	Carbon steel	Plate	SA-738	A	K12447	...
6	Carbon steel	Plate	SA-537	...	K12437	3
7	Carbon steel	Plate	SA-537	...	K12437	2
8	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437	...
9	Carbon steel	Plate	SA-738	C	K02008	...
10	Carbon steel	Plate, sheet, bar	SA-572	60	...	...
11	Carbon steel	Round bar	SA-572	60	...	...
12	Carbon steel	Sheet, strip	SA-1011	60	HSLAS	1
13	Carbon steel	Plate	SA-299	B	K02803	...
14	Carbon steel	Plate	SA-299	B	K02803	...
15	Carbon steel	Forgings	SA-765	IV	K02009	...
16	Carbon steel	Plate	SA-537	...	K12437	3
17	Carbon steel	Plate	SA-537	...	K12437	2
18	Carbon steel	Wld. pipe	SA-671	CD80	K12437	...
19	Carbon steel	Wld. pipe	SA-672	D80	K12437	...
20	Carbon steel	Wld. pipe	SA-691	CMSH-80	K12437	...
21	Carbon steel	Plate	SA-738	C	K02008	...
22	Carbon steel	Plate	SA-841	B	...	2
23	Carbon steel	Plate, sheet, bar	SA-572	65	...	...
24	Carbon steel	Plate	SA-612	...	K02900	...
25	Carbon steel	Plate	SA-841	F	...	6
26	Carbon steel	Plate	SA-612	...	K02900	...
27	Carbon steel	Plate	SA-738	B	K12007	...
28	Carbon steel	Plate	SA-841	F	...	7
29	Carbon steel	Forgings	SA-372	C	K04801	...
30	Carbon steel	Bolting	SA-449	...	K04200	...
31	Carbon steel	Plate	SA-724	A	K11831	...
32	Carbon steel	Plate	SA-724	C	K12037	...
33	Carbon steel	Plate	SA-724	B	K12031	...
34	Carbon steel	Bolting	SA-325	...	...	...
35	Carbon steel	Bolting	SA-325	1	K02706	...
36	Carbon steel	Bolting	SA-449	...	K04200	...
37	Carbon steel	Bolting	SA-354	BC	K04100	...
38	Carbon steel	Bolting	SA-325	1	K02706	...
39	Carbon steel	Bolting	SA-449	...	K04200	...
40	Carbon steel	Bolting	SA-354	BC	K04100	...
41	Carbon steel	Bolting	SA-354	BD	K04100	...
42	Carbon steel	Bolting	SA-354	BD	K04100	...
43	Carbon steel	Flat wire	SA-905	...	...	2
44	Carbon steel	Flat wire	SA-905	...	...	2
45	Carbon steel	Flat wire	SA-905	...	...	2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	≤ 1	75	42	...
2	≤ 1	75	42	...
3	...	75	45	...
4	...	75	45	...
5	...	75	45	...
6	$2\frac{1}{2} < t \leq 4$	75	50	...
7	$2\frac{1}{2} < t \leq 4$	75	55	...
8	$2\frac{1}{2} < t \leq 4$	75	55	...
9	$2\frac{1}{2} < t \leq 4$	75	55	...
10	$t \leq 1\frac{1}{4}$	75	60	...
11	$t \leq 3\frac{1}{2}$	75	60	...
12	...	75	60	...
13	> 1	80	45	...
14	≤ 1	80	47	...
15	...	80	50	...
16	$\leq 2\frac{1}{2}$	80	55	...
17	$\leq 2\frac{1}{2}$	80	60	...
18	$\leq 2\frac{1}{2}$	80	60	...
19	$\leq 2\frac{1}{2}$	80	60	...
20	$\leq 2\frac{1}{2}$	80	60	...
21	$\leq 2\frac{1}{2}$	80	60	...
22	≤ 4	80	60	...
23	$t \leq 1\frac{1}{4}$	80	65	...
24	$\frac{1}{2} < t \leq 1$	81	50	...
25	$t \leq 1.25$	82	70	...
26	$\leq \frac{1}{2}$	83	50	...
27	...	85	60	...
28	$t \leq 1$	86	75	...
29	...	90	55	...
30	$1\frac{1}{2} < t \leq 3$	90	58	...
31	...	90	70	...
32	...	90	70	...
33	...	95	75	...
34	...	105	81	...
35	$1\frac{1}{8} \leq t \leq 1\frac{1}{2}$	105	81	...
36	$1 < t < 1\frac{1}{2}$	105	81	...
37	$2\frac{1}{2} < t \leq 4$	115	99	...
38	$\frac{1}{2} \leq t \leq 1$	120	92	...
39	≤ 1	120	92	...
40	$\frac{1}{4} < t \leq 2\frac{1}{2}$	125	109	...
41	$2\frac{1}{2} < t \leq 4$	140	115	...
42	$\frac{1}{4} < t \leq 2\frac{1}{2}$	150	130	...
43	0.059	246	210	(1)
44	0.051	250	214	(1)
45	0.040	256	221	(1)

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	42.0	39.5	38.5	37.8	37.2	...	35.9	...	34.2
2	42.0	39.5	38.5	37.8	37.2	...	35.9	...	34.2
3	45.0	42.3	41.2	40.5	39.8	...	38.4	...	36.7
4	45.0	42.3	41.2	40.5	39.8	...	38.4	...	36.7
5	45.0	42.3	41.2	40.5	39.8	...	38.4	...	36.7
6	50.0	46.3	44.2	42.2	40.5	...	37.6	...	35.4
7	55.0	51.0	48.6	46.4	44.5	...	41.3	...	38.9
8	55.0	51.0	48.6	46.4	44.5	...	41.3	...	38.9
9	55.0	51.0	48.6	46.4	44.5	...	41.3	...	38.9
10	60.0	55.8	53.0	50.7	48.6	46.6	45.1	43.9	42.4
11	60.0	55.8	53.0	50.7	48.6	46.6	45.1	43.9	42.4
12	60.0	55.8	53.0	50.7	48.6	46.6	45.1	43.9	42.4
13	45.0	...	41.2	...	39.8	...	38.4	...	36.7
14	47.0	...	43.1	...	41.6	...	40.2	...	38.3
15	50.0	47.6	45.8	44.5	43.5	...	41.4	...	39.7
16	55.0	51.0	48.6	46.4	44.5	...	41.3	...	38.9
17	60.0	55.6	53.0	50.7	48.6	...	45.1	...	42.4
18	60.0	55.6	53.0	50.7	48.6	...	45.1	...	42.4
19	60.0	55.6	53.0	50.7	48.6	...	45.1	...	42.4
20	60.0	55.6	53.0	50.7	48.6	...	45.1	...	42.4
21	60.0	55.6	53.0	50.7	48.6	...	45.1	...	42.4
22	60.0	...	55.3	...	52.8	...	50.7	...	49.6
23	65.0	60.4	57.4	54.9	52.6	50.5	48.8	47.5	45.9
24	50.0	...	44.1	...	40.6	...	37.5	...	35.3
25	70.0	67.1	64.8	...	61.2	...	59.3	...	58.0
26	50.0	...	44.1	...	40.6	...	37.5	...	35.3
27	60.0	56.9	55.2	53.6	52.3	...	49.9	...	48.0
28	75.0	71.9	69.5	...	65.6	...	63.5	...	62.1
29	55.0	51.7	50.4	49.4	48.7	...	47.0	...	44.8
30	58.0	...	53.1	...	51.3	...	49.6	...	47.3
31	70.0	64.9	61.8	59.1	56.7	...	52.6	...	49.5
32	70.0	64.9	61.8	59.1	56.7	...	52.6	...	49.5
33	75.0	69.5	66.3	63.3	60.7	...	56.3	...	53.1
34	81.0	...	71.6	...	65.6	...	60.8	...	57.3
35	81.0	...	71.6	...	65.6	...	60.8	...	57.3
36	81.0	...	71.6	...	65.6	...	60.8	...	57.3
37	99.0	...	90.7	...	87.6	...	84.6	...	80.7
38	92.0	...	81.3	...	74.5	...	69.1	...	65.1
39	92.0	...	81.3	...	74.5	...	69.1	...	65.1
40	109.0	...	99.9	...	96.4	...	93.1	...	88.8
41	115.0	...	105.4	...	101.7	...	98.3	...	93.7
42	130.0	...	119.1	...	115.0	...	111.0	...	105.9
43	210.0	...	...	...	...	...	...	...	...
44	214.0	...	...	...	...	...	...	...	...
45	221.0	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	32.2	31.1	30.1	29.1	28.2	27.3	26.5	25.8	25.0
2	...	32.2	31.1	30.1	29.1	28.2	27.3	26.5	25.8	25.0
3	...	34.5	33.4	32.2	31.2	30.2	29.3	28.4	27.6	26.7
4	...	34.5	33.4	32.2	31.2	30.2	29.3	28.4	27.6	26.7
5	...	34.5	33.4	32.2	31.2	30.2	29.3	28.4	27.6	26.7
6	...	33.7	33.0	32.3	31.5	30.5	...	...	...	...
7	...	37.1	36.3	35.5	34.6	33.5	...	...	...	...
8	...	37.1	36.3	35.5	34.6	33.5	...	...	...	...
9	...	37.1	36.3	35.5	34.6	33.5	...	...	...	...
10	41.2	40.5	...	...	...	...	...	...	...	...
11	41.2	40.5	...	...	...	...	...	...	...	...
12	41.2	40.5	...	...	...	...	...	...	...	...
13	...	34.5	33.4	32.2	31.2	30.2	29.3	28.4	27.6	26.7
14	...	36.0	34.8	33.7	32.5	31.5	30.6	29.7	28.9	27.9
15	...	38.2	37.7	37.1	...	...	...	...	...	...
16	...	37.1	36.3	35.5	34.6	33.5	...	...	...	...
17	...	40.5	39.6	38.7	37.7	36.6	...	...	...	...
18	...	40.5	39.6	38.7	37.7	36.6	...	...	...	...
19	...	40.5	39.6	38.7	37.7	36.6	...	...	...	...
20	...	40.5	39.6	38.7	37.7	36.6	...	...	...	...
21	...	40.5	39.6	38.7	37.7	36.6	...	...	...	...
22	...	48.2	47.1	45.7	44.0	41.9	...	...	...	...
23	44.7	43.9	...	...	...	...	...	...	...	...
24	...	33.9	33.0	32.1	...	...	...	...	...	...
25	...	56.1	55.0	...	...	...	...	...	...	...
26	...	33.9	33.0	32.1	...	...	...	...	...	...
27	...	46.3	45.4	44.5	43.5	42.4	...	...	...	...
28	...	60.1	58.9	...	...	...	...	...	...	...
29	...	42.2	40.8	39.4	38.1	36.9	35.8	34.8	33.8	32.7
30	...	44.5	43.0	41.5	40.2	38.9	37.7	36.7	...	...
31	...	47.2	46.2	45.2	44.0	42.7	...	...	...	...
32	...	47.2	46.2	45.2	44.0	42.7	...	...	...	...
33	...	50.6	49.5	48.4	47.2	45.7	...	...	...	...
34	...	54.6	53.4	52.3	51.0	49.4	47.4	44.8	41.4	36.9
35	...	54.6	53.4	52.3	51.0	49.4	47.4	44.8	41.4	36.9
36	...	54.6	53.4	52.3	51.0	49.4	47.4	44.8	41.4	36.9
37	...	75.9	73.4	70.9	68.5	66.4	64.4	62.6	60.8	58.8
38	...	62.0	60.7	59.3	57.9	56.1	53.9	50.9	47.0	41.9
39	...	62.0	60.7	59.3	57.9	56.1	53.9	50.9	47.0	41.9
40	...	83.6	80.8	78.1	75.5	73.1	70.9	68.9	66.9	64.8
41	...	88.2	85.2	82.3	79.6	77.1	74.8	72.7	70.6	68.4
42	...	99.6	96.2	93.0	89.8	87.0	84.3	81.9	79.5	76.9
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Carbon steel	Flat wire	SA-905	...	...	2
2	Carbon steel	Flat wire	SA-905	...	...	2
3	Carbon steel	Flat wire	SA-905	...	...	1
4	Carbon steel	Flat wire	SA-905	...	...	1
5	Carbon steel	Flat wire	SA-905	...	...	1
6	Carbon steel	Flat wire	SA-905	...	...	1
7	Carbon steel	Flat wire	SA-905	...	...	1
8	Ductile cast iron	Castings	SA-874	...	...	...
9	Ductile cast iron	Castings	SA/JIS G5504	FCD 300 LT	...	...
10	C-Mn-Si-Cb	Plate	SA-737	B	K12001	...
11	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490	...	...
12	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490	...	...
13	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490	...	...
14	C-Mn-Si-Cb	Plate	SA/AS 1548	PT490	...	...
15	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized
16	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized
17	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized
18	C-Mn-Si-Cb	Plate	SA/GB 713	Q370R	...	Normalized
19	C-Mn-Si-V	Plate	SA-737	C	K12202	...
20	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...
21	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...
22	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...
23	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...
24	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...
25	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...
26	C-Mn-Si-V-Cb	Plate	SA-656	T3	...	...
27	C-Mn-Si-V-Cb	Plate	SA-656	T7	...	...
28	C-Mn-Ti	Plate, sheet	SA-562	...	K11224	...
29	C-Si-Ti	Forgings	SA-836	...	...	1
30	C- $\frac{1}{4}$ Mo	Bolting	SA-320	L7A	G40370	...
31	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4037	G40370	...
32	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4042	G40420	...
33	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4140	G41400	...
34	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4037	G40370	...
35	C- $\frac{1}{4}$ Mo	Bolting	SA-574	4042	G40420	...
36	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...
37	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...
38	C-0.3Mo	Smls. tube	SA/EN 10216-2	16Mo3	...	...
39	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1b	K11422	...
40	C- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T1b	K11422	...
41	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1	K11522	...
42	C- $\frac{1}{2}$ Mo	Smls. & wld. fittings	SA-234	WP1	K12821	...
43	C- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T1	K11522	...
44	C- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P1	K11522	...
45	C- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP1	K11522	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	0.030	262	226	(1)
2	0.020	268	232	(1)
3	0.059	275	239	(1)
4	0.051	280	243	(1)
5	0.040	285	250	(1)
6	0.030	290	255	(1)
7	0.020	296	260	(1)
8	$12 < t < 21$	43.5	29	...
9	$12 < t < 21$	43.5	29	...
10	...	70	50	...
11	$3\frac{1}{4} < t \leq 6$	71	46.5	...
12	$1\frac{1}{2} < t \leq 3\frac{1}{4}$	71	48	...
13	$\frac{5}{8} < t \leq 1\frac{1}{2}$	71	49.5	...
14	$\leq \frac{5}{8}$	71	52	...
15	$2.5 < t \leq 4$	74	48	...
16	$1.5 < t \leq 2.5$	75.5	49.5	...
17	$0.6 < t \leq 1.5$	77	52	...
18	$0.4 \leq t \leq 0.6$	77	53.5	...
19	...	80	60	...
20	≤ 2	60	50	...
21	≤ 2	60	50	...
22	$\leq 1\frac{1}{2}$	70	60	...
23	$\leq 1\frac{1}{2}$	70	60	...
24	≤ 1	80	70	...
25	≤ 1	80	70	...
26	$\leq \frac{3}{4}$	90	80	...
27	$\leq \frac{3}{4}$	90	80	...
28	...	55	30	...
29	...	55	25	...
30	$\leq 2\frac{1}{2}$	125	105	...
31	$\geq \frac{5}{8}$	170	135	...
32	$\geq \frac{5}{8}$	170	135	...
33	$\geq \frac{5}{8}$	170	135	...
34	$\leq 1\frac{1}{2}$	180	140	...
35	$\leq 1\frac{1}{2}$	180	140	...
36	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	65.5	37.5	...
37	$\frac{5}{8} < t \leq 1\frac{5}{8}$	65.5	39	...
38	$t \leq \frac{5}{8}$	65.5	40.5	...
39	...	53	28	...
40	...	53	28	...
41	...	55	30	...
42	...	55	30	...
43	...	55	30	...
44	...	55	30	...
45	...	55	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	226.0	...	...	...	...	...	...	...	...
2	232.0	...	...	...	...	...	...	...	...
3	239.0	...	224.0	...	...	...	...	...	...
4	243.0	...	228.0	...	...	...	...	...	...
5	250.0	...	234.0	...	...	...	...	...	...
6	255.0	...	239.0	...	...	...	...	...	...
7	260.0	...	244.0	...	...	...	...	...	...
8	29.0	...	25.4	...	24.1	...	23.5	...	23.1
9	29.0	...	25.4	...	24.1	...	23.5	...	23.1
10	50.0	47.9	45.8	43.6	41.4	...	37.7	...	35.3
11	46.5	...	42.6	...	38.5	...	35.0	...	32.8
12	48.0	...	44.0	...	39.7	...	36.2	...	33.9
13	49.5	...	45.4	...	41.0	...	37.3	...	34.9
14	52.0	...	47.7	...	43.0	...	39.2	...	36.7
15	47.9	46.2	44.0	41.7	39.5	37.6	36.0	...	33.8
16	49.3	47.4	45.3	43.0	40.7	38.7	37.1	...	34.8
17	52.2	50.2	48.0	45.5	43.1	41.0	39.3	...	36.9
18	53.7	51.6	49.3	46.8	44.3	42.1	40.3	...	37.9
19	60.0	57.5	55.0	52.3	49.7	...	45.2	...	42.3
20	50.0	...	45.8	...	41.4	...	37.7	...	35.3
21	50.0	...	45.8	...	41.4	...	37.7	...	35.3
22	60.0	...	55.0	...	49.7	...	45.2	...	42.3
23	60.0	...	55.0	...	49.7	...	45.2	...	42.3
24	70.0	...	64.2	...	57.9	...	52.7	...	49.4
25	70.0	...	64.2	...	57.9	...	52.7	...	49.4
26	80.0	...	73.4	...	66.2	...	60.3	...	56.5
27	80.0	...	73.4	...	66.2	...	60.3	...	56.5
28	30.0	27.3	25.8	24.7	24.0	...	23.4	...	23.4
29	25.0	22.7	21.5	20.6	20.0	...	19.5	...	19.5
30	105.0	...	96.2	...	92.9	...	89.7	...	85.6
31	135.0	...	126.9	...	121.7	...	117.6	...	114.0
32	135.0	...	126.9	...	121.7	...	117.6	...	114.0
33	135.0	...	126.9	...	121.7	...	117.6	...	114.0
34	140.0	...	131.6	...	126.2	...	121.9	...	118.2
35	140.0	...	131.6	...	126.2	...	121.9	...	118.2
36	37.7	36.3	35.4	34.7	34.0	33.4	32.8	32.3	31.8
37	39.2	37.7	36.8	36.0	35.3	34.7	34.1	33.6	33.1
38	40.6	39.1	38.2	37.4	36.6	36.0	35.4	34.8	34.3
39	28.0	26.9	26.3	25.8	25.2	...	24.4	...	23.6
40	28.0	26.9	26.3	25.8	25.2	...	24.4	...	23.6
41	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
42	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
43	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
44	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
45	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	22.5	22.1	...	...	...	...	...	...	...
9	...	22.5	22.1	...	...	...	...	...	...	...
10	...	33.9	33.4	32.9	32.2	31.2	29.9	28.1	25.9	25.9
11	...	31.6	31.1	30.6	29.9	29.0	27.8	26.1	24.1	21.6
12	...	32.6	32.1	31.6	30.9	30.0	28.7	27.0	24.8	22.3
13	...	33.6	33.1	32.6	31.9	30.9	29.6	27.8	25.6	22.0
14	...	35.3	34.8	34.2	33.5	32.5	31.1	29.2	26.9	24.1
15	33.1	32.6	32.1	31.5	30.7	29.7	28.5	27.0	25.3	23.7
16	34.1	33.6	33.1	32.5	31.7	30.6	29.3	27.8	26.1	24.6
17	36.1	35.6	35.0	34.4	33.5	32.4	31.0	29.4	27.7	26.0
18	37.1	36.5	36.0	35.3	34.5	33.3	31.9	30.2	28.4	26.7
19	...	40.7	40.1	39.5	38.6	37.5	35.9	33.7	31.0	31.0
20	...	33.9	33.4	...	...	...	...	...	...	...
21	...	33.9	33.4	...	...	...	...	...	...	...
22	...	40.7	40.1	...	...	...	...	...	...	...
23	...	40.7	40.1	...	...	...	...	...	...	...
24	...	47.5	46.8	...	...	...	...	...	...	...
25	...	47.5	46.8	...	...	...	...	...	...	...
26	...	54.3	53.5	...	...	...	...	...	...	...
27	...	54.3	53.5	...	...	...	...	...	...	...
28	...	23.4	23.4	23.3	22.9	...	...	...	...	...
29	...	19.5	19.5	19.4	19.1	...	...	...	...	...
30	...	80.5	77.8	75.2	72.7	70.4	68.3	66.4	64.5	62.4
31	...	110.4	108.4	106.2	103.7	100.9	97.7	94.1	90.0	85.5
32	...	110.4	108.4	106.2	103.7	100.9	97.7	94.1	90.0	85.5
33	...	110.4	108.4	106.2	103.7	100.9	97.7	94.1	90.0	85.5
34	...	114.5	112.4	110.1	107.6	104.6	101.3	97.5	93.3	88.6
35	...	114.5	112.4	110.1	107.6	104.6	101.3	97.5	93.3	88.6
36	31.3	30.8	30.3	29.7	29.0	28.2	27.3	26.3	25.1	23.9
37	32.5	32.0	31.4	30.8	30.1	29.3	28.3	27.3	26.1	24.8
38	33.8	33.2	32.6	31.9	31.2	30.4	29.4	28.3	27.1	25.7
39	...	22.9	22.5	22.0	21.5	20.9	20.3	19.5	18.7	17.7
40	...	22.9	22.5	22.0	21.5	20.9	20.3	19.5	18.7	17.7
41	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
42	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
43	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
44	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
45	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	C- $\frac{1}{2}$ Mo	Smls. tube	SA-209	T1a	K12023	...
2	C- $\frac{1}{2}$ Mo	Wld. tube	SA-250	T1a	K12023	...
3	C- $\frac{1}{2}$ Mo	Castings	SA-217	WC1	J12524	...
4	C- $\frac{1}{2}$ Mo	Castings	SA-352	LC1	J12522	...
5	C- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP1	J12521	...
6	C- $\frac{1}{2}$ Mo	Plate	SA-204	A	K11820	...
7	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L65	K11820	...
8	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-65	K11820	...
9	C- $\frac{1}{2}$ Mo	Forgings	SA-182	F1	K12822	...
10	C- $\frac{1}{2}$ Mo	Plate	SA-204	B	K12020	...
11	C- $\frac{1}{2}$ Mo	Forgings	SA-336	F1	K12520	...
12	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L70	K12020	...
13	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-70	K12020	...
14	C- $\frac{1}{2}$ Mo	Plate	SA-204	C	K12320	...
15	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	L75	K12320	...
16	C- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	CM-75	K12320	...
17	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	55
18	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	55
19	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	65
20	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	65
21	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	G	K13049	70
22	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	H	K13547	70
23	$\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo-V	Plate	SA-517	B	K11630	...
24	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Plate	SA-517	A	K11856	...
25	$\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si	Forgings	SA-592	A	K11856	...
26	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P2	K11547	...
27	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP2	K11547	...
28	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143	1
29	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143	...
30	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T2	K11547	...
31	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP2	J11547	...
32	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F2	K12122	...
33	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-387	2	K12143	2
34	$\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	$\frac{1}{2}$ CR	K12143	...
35	$\frac{3}{4}$ Cr- $\frac{1}{2}$ Ni-Cu	Wld. tube	SA-423	1	K11535	...
36	$\frac{3}{4}$ Cr- $\frac{3}{4}$ Ni-Cu-Al	Pipe	SA-333	4	K11267	...
37	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047	55
38	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	55
39	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548	55
40	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...
41	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7M	G41400	...
42	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-320	L7M	G41400	...
43	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	65
44	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...
45	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	E	K13047	70

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	60	32	...
2	...	60	32	...
3	...	65	35	...
4	...	65	35	...
5	...	65	35	...
6	...	65	37	...
7	...	65	37	...
8	...	65	37	...
9	...	70	40	...
10	...	70	40	...
11	...	70	40	...
12	...	70	40	...
13	...	70	40	...
14	...	75	43	...
15	...	75	43	...
16	...	75	43	...
17	...	85	55	...
18	...	85	55	...
19	...	105	65	...
20	...	105	65	...
21	...	120	70	...
22	...	120	70	...
23	$\leq 1\frac{1}{4}$	115	100	...
24	$\leq 1\frac{1}{4}$	115	100	...
25	$\leq 2\frac{1}{2}$	115	100	...
26	...	55	30	...
27	...	55	30	...
28	...	55	33	...
29	...	55	33	...
30	...	60	30	...
31	...	60	30	...
32	...	70	40	...
33	...	70	45	...
34	...	70	45	...
35	...	60	37	...
36	...	60	35	...
37	...	85	55	...
38	...	85	55	...
39	...	85	55	...
40	$4 < t \leq 7$	100	75	...
41	$\leq 2\frac{1}{2}$	100	80	...
42	$\leq 2\frac{1}{2}$	100	80	...
43	...	105	65	...
44	$2\frac{1}{2} < t \leq 4$	115	95	...
45	...	120	70	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	32.0	30.8	30.1	29.4	28.9	...	27.9	...	27.0
2	32.0	30.8	30.1	29.4	28.9	...	27.9	...	27.0
3	35.0	33.7	32.9	32.2	31.6	...	30.5	...	29.5
4	35.0	33.7	32.9	32.2	31.6	...	30.5	...	29.5
5	35.0	33.7	32.9	32.2	31.6	...	30.5	...	29.5
6	37.0	35.6	34.8	34.0	33.4	...	32.2	...	31.2
7	37.0	35.6	34.8	34.0	33.4	...	32.2	...	31.2
8	37.0	35.6	34.8	34.0	33.4	...	32.2	...	31.2
9	40.0	38.5	37.6	36.8	36.1	...	34.8	...	33.8
10	40.0	38.5	37.6	36.8	36.1	...	34.8	...	33.8
11	40.0	38.5	37.6	36.8	36.1	...	34.8	...	33.8
12	40.0	38.5	37.6	36.8	36.1	...	34.8	...	33.8
13	40.0	38.5	37.6	36.8	36.1	...	34.8	...	33.8
14	43.0	41.4	40.4	39.6	38.8	...	37.4	...	36.3
15	43.0	41.4	40.4	39.6	38.8	...	37.4	...	36.3
16	43.0	41.4	40.4	39.6	38.8	...	37.4	...	36.3
17	55.0	52.7	51.4	50.3	49.4	...	47.8	...	46.3
18	55.0	52.7	51.4	50.3	49.4	...	47.8	...	46.3
19	65.0	62.3	60.8	59.5	58.4	...	56.5	...	54.8
20	65.0	62.3	60.8	59.5	58.4	...	56.5	...	54.8
21	70.0	66.9	65.2	63.9	62.8	...	60.9	...	59.1
22	70.0	66.9	65.2	63.9	62.8	...	60.9	...	59.1
23	100.0	97.2	95.5	93.9	92.4	...	89.9	...	87.6
24	100.0	97.2	95.5	93.9	92.4	...	89.9	...	87.6
25	100.0	97.2	95.5	93.9	92.4	...	89.9	...	87.6
26	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
27	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
28	33.0	31.8	31.0	30.4	29.8	...	28.7	...	27.9
29	33.0	31.8	31.0	30.4	29.8	...	28.7	...	27.9
30	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
31	30.0	28.9	28.2	27.6	27.1	...	26.1	...	25.3
32	40.0	38.5	37.6	36.8	36.1	...	34.8	...	33.8
33	45.0	43.3	42.3	41.4	40.6	...	39.2	...	38.0
34	45.0	43.3	42.3	41.4	40.6	...	39.2	...	38.0
35	37.0	35.0	34.1	33.5	33.0	...	32.3	...	31.6
36	35.0	33.1	32.3	31.7	31.3	...	30.6	...	29.9
37	55.0	52.7	51.4	50.3	49.4	...	47.8	...	46.3
38	55.0	52.7	51.4	50.3	49.4	...	47.8	...	46.3
39	55.0	52.7	51.4	50.3	49.4	...	47.8	...	46.3
40	75.0	...	69.9	...	67.2	...	65.3	...	63.2
41	80.0	...	74.6	...	71.7	...	69.7	...	67.4
42	80.0	...	74.6	...	71.7	...	69.7	...	67.4
43	65.0	62.3	60.8	59.5	58.4	...	56.5	...	54.8
44	95.0	...	88.5	...	85.1	...	82.7	...	80.1
45	70.0	66.9	65.2	63.9	62.8	...	60.9	...	59.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	26.2	25.7	25.2	24.6	23.9	23.2	22.3	21.3	20.3
2	...	26.2	25.7	25.2	24.6	23.9	23.2	22.3	21.3	20.3
3	...	28.6	28.1	27.5	26.9	26.2	25.3	24.4	23.3	22.2
4	...	28.6	28.1	27.5	26.9	26.2	25.3	24.4	23.3	22.2
5	...	28.6	28.1	27.5	26.9	26.2	25.3	24.4	23.3	22.2
6	...	30.2	29.7	29.1	28.4	27.7	26.8	25.8	24.7	23.4
7	...	30.2	29.7	29.1	28.4	27.7	26.8	25.8	24.7	23.4
8	...	30.2	29.7	29.1	28.4	27.7	26.8	25.8	24.7	23.4
9	...	32.7	32.1	31.5	30.7	29.9	28.9	27.9	26.7	25.3
10	...	32.7	32.1	31.5	30.7	29.9	28.9	27.9	26.7	25.3
11	...	32.7	32.1	31.5	30.7	29.9	28.9	27.9	26.7	25.3
12	...	32.7	32.1	31.5	30.7	29.9	28.9	27.9	26.7	25.3
13	...	32.7	32.1	31.5	30.7	29.9	28.9	27.9	26.7	25.3
14	...	35.2	34.5	33.8	33.0	32.1	31.1	30.0	28.7	27.2
15	...	35.2	34.5	33.8	33.0	32.1	31.1	30.0	28.7	27.2
16	...	35.2	34.5	33.8	33.0	32.1	31.1	30.0	28.7	27.2
17	...	44.7	43.6	42.2	40.6	38.7	36.3	33.6	30.4	26.7
18	...	44.7	43.6	42.2	40.6	38.7	36.3	33.6	30.4	26.7
19	...	52.8	51.5	49.9	48.0	45.7	43.0	39.7	35.9	31.5
20	...	52.8	51.5	49.9	48.0	45.7	43.0	39.7	35.9	31.5
21	...	56.8	55.4	53.7	51.7	49.2	46.3	42.8	38.7	33.9
22	...	56.8	55.4	53.7	51.7	49.2	46.3	42.8	38.7	33.9
23	...	85.5	84.3	83.0	81.4	79.5	77.1	74.2	70.5	66.1
24	...	85.5	84.3	83.0	81.4	79.5	77.1	74.2	70.5	66.1
25	...	85.5	84.3	83.0	81.4	79.5	77.1	74.2	70.5	66.1
26	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
27	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
28	...	27.0	26.5	26.0	25.4	24.7	23.9	23.0	22.0	20.9
29	...	27.0	26.5	26.0	25.4	24.7	23.9	23.0	22.0	20.9
30	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
31	...	24.5	24.1	23.6	23.1	22.4	21.7	20.9	20.0	19.0
32	...	32.7	32.1	31.5	30.7	29.9	28.9	27.9	26.7	25.3
33	...	36.8	36.1	35.4	34.6	33.6	32.6	31.4	30.0	28.5
34	...	36.8	36.1	35.4	34.6	33.6	32.6	31.4	30.0	28.5
35	...	30.9	30.5	30.0	29.5	28.8	28.0	27.0	25.6	23.7
36	...	29.2	28.8	28.4	27.9	27.3	26.5	25.5	24.2	22.4
37	...	44.7	43.6	42.2	40.6	38.7	36.3	33.6	30.4	26.7
38	...	44.7	43.6	42.2	40.6	38.7	36.3	33.6	30.4	26.7
39	...	44.7	43.6	42.2	40.6	38.7	36.3	33.6	30.4	26.7
40	...	60.9	59.3	57.6	55.4	52.8	49.7	45.8	41.5	36.4
41	...	65.0	63.2	61.4	59.1	56.3	53.0	48.8	44.2	38.8
42	...	65.0	63.2	61.4	59.1	56.3	53.0	48.8	44.2	38.8
43	...	52.8	51.5	49.9	48.0	45.7	43.0	39.7	35.9	31.5
44	...	77.1	75.1	73.0	70.2	66.9	62.9	58.0	52.5	46.1
45	...	56.8	55.4	53.7	51.7	49.2	46.3	42.8	38.7	33.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	F	G41350	70
2	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	K13548	70
3	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-193	B7	G41400	...
4	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-320	L7	G41400	...
5	1Cr- $\frac{1}{5}$ Mo	Forgings	SA-372	J	G41370	110
6	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4137	G41370	...
7	1Cr- $\frac{1}{5}$ Mo	Bolting	SA-574	4137	G41370	...
8	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	1
9	1Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	1CR	K11757	...
10	1Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP12	J11562	...
11	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11562	1
12	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T12	K11562	...
13	1Cr- $\frac{1}{2}$ Mo	Smls. & wld. fittings	SA-234	WP12	K12062	1
14	1Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P12	K11562	...
15	1Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP12	K11562	...
16	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT
17	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...
18	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...
19	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	NT
20	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT
21	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...
22	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT or QT
23	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA/EN 10216-2	13CrMo4-5	...	...
24	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT
25	1Cr- $\frac{1}{2}$ Mo	Smls. tube	SA/EN 10216-2	13CrMo4-5	...	...
26	1Cr- $\frac{1}{2}$ Mo	Forgings	SA/EN 10222-2	13CrMo4-5	...	NT
27	1Cr- $\frac{1}{2}$ Mo	Plate	SA-387	12	K11757	2
28	1Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	1CR	K11757	...
29	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	NT
30	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...
31	1Cr- $\frac{1}{2}$ Mo	Plate	SA/GB 713	15CrMoR	...	NT
32	1Cr- $\frac{1}{2}$ Mo	Plate	SA/EN 10028-2	13CrMo4-5	...	...
33	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F12	K11564	2
34	1Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F12	K11564	...
35	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...
36	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...
37	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	5
38	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	5
39	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-193	B16	K14072	...
40	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	4
41	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	3
42	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	2
43	1Cr- $\frac{1}{2}$ Mo-V	Bolting	SA-540	B21	K14073	1
44	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	K41420	5
45	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	K41420	5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	120	70	...
2	...	120	70	...
3	$\leq 2\frac{1}{2}$	125	105	...
4	$\leq 2\frac{1}{2}$	125	105	...
5	...	135	110	...
6	$\geq \frac{5}{8}$	170	135	...
7	$\leq \frac{1}{2}$	180	140	...
8	...	55	33	...
9	...	55	33	...
10	...	60	30	...
11	...	60	32	...
12	...	60	32	...
13	...	60	32	...
14	...	60	32	...
15	...	60	32	...
16	$10 < t \leq 20$	61	35	...
17	$6 < t \leq 10$	61	35.5	...
18	$4 < t \leq 6$	62.5	37	...
19	$4 < t \leq 8$	64	37	...
20	$4 < t \leq 10$	64	38.5	...
21	$2.5 < t \leq 4$	64	39	...
22	$2.8 < t \leq 4$	64	40	...
23	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	64	40.5	...
24	$1.4 < t \leq 2.8$	64	41.5	...
25	$t \leq 1\frac{5}{8}$	64	42	...
26	$t \leq 1.4$	64	43	...
27	...	65	40	...
28	...	65	40	...
29	$2.5 < t \leq 4$	65.5	40	...
30	$\frac{5}{8} < t \leq 2.5$	65.5	42	...
31	$0.25 \leq t \leq 2.5$	65.5	43	...
32	$t \leq \frac{5}{8}$	65.5	43.5	...
33	...	70	40	...
34	...	70	40	...
35	$4 < t \leq 8$	100	85	...
36	$2\frac{1}{2} < t \leq 4$	110	95	...
37	$2 < t \leq 8$	115	100	...
38	≤ 2	120	105	...
39	$\leq 2\frac{1}{2}$	125	105	...
40	≤ 6	135	120	...
41	≤ 6	145	130	...
42	≤ 4	155	140	...
43	≤ 4	165	150	...
44	$2 < t \leq 4$	115	100	...
45	≤ 2	120	105	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	70.0	66.9	65.2	63.9	62.8	...	60.9	...	59.1
2	70.0	66.9	65.2	63.9	62.8	...	60.9	...	59.1
3	105.0	...	98.0	...	94.1	...	91.5	...	88.5
4	105.0	...	98.0	...	94.1	...	91.5	...	88.5
5	110.0	105.1	102.5	100.4	98.6	...	95.6	...	92.8
6	135.0	129.0	125.8	123.2	121.0	...	117.3	...	113.9
7	140.0	133.8	130.5	127.8	125.5	...	121.7	...	118.1
8	33.0	31.0	29.8	28.9	28.1	...	26.8	...	25.9
9	33.0	31.0	29.8	28.9	28.1	...	26.8	...	25.9
10	30.0	28.1	27.1	26.2	25.5	...	24.4	...	23.5
11	32.0	30.0	28.9	28.0	27.2	...	26.0	...	25.1
12	32.0	30.0	28.9	28.0	27.2	...	26.0	...	25.1
13	32.0	30.0	28.9	28.0	27.2	...	26.0	...	25.1
14	32.0	30.0	28.9	28.0	27.2	...	26.0	...	25.1
15	32.0	30.0	28.9	28.0	27.2	...	26.0	...	25.1
16	34.8	32.8	31.6	30.6	29.7	29.0	28.3	...	27.4
17	35.5	33.3	32.1	31.1	30.2	29.5	28.9	28.4	27.9
18	37.0	34.7	33.5	32.4	31.5	30.7	30.0	29.5	29.0
19	32.6	30.6	29.5	28.6	27.8	27.1	26.5	...	25.6
20	38.4	36.2	34.9	33.8	32.8	32.0	31.3	...	30.2
21	39.2	36.7	35.4	34.3	33.3	32.5	31.8	31.3	30.7
22	39.9	37.6	36.3	35.1	34.1	33.2	32.5	...	31.4
23	40.6	38.6	37.5	36.5	35.6	34.9	34.2	33.6	33.0
24	41.3	38.9	37.6	36.4	35.3	34.4	33.6	...	32.5
25	42.1	40.0	38.8	37.8	36.9	36.1	35.4	34.8	34.2
26	42.8	40.3	38.9	37.6	36.5	35.6	34.8	...	33.6
27	40.0	37.5	36.2	35.0	34.0	...	32.5	...	31.4
28	40.0	37.5	36.2	35.0	34.0	...	32.5	...	31.4
29	39.9	37.4	36.1	34.9	33.9	33.1	32.4	...	31.3
30	42.1	39.4	38.0	36.8	35.8	34.9	34.2	33.6	33.0
31	42.8	40.1	38.7	37.5	36.4	35.5	34.7	...	33.6
32	43.5	40.8	39.4	38.1	37.0	36.1	35.3	34.7	34.1
33	40.0	37.5	36.2	35.0	34.0	...	32.5	...	31.4
34	40.0	37.5	36.2	35.0	34.0	...	32.5	...	31.4
35	85.0	...	82.0	...	79.9	...	77.8	...	75.7
36	95.0	...	91.7	...	89.3	...	86.9	...	84.6
37	100.0	...	96.7	...	93.8	...	91.5	...	89.0
38	105.0	...	101.3	...	98.7	...	96.1	...	93.5
39	105.0	...	101.3	...	98.7	...	96.1	...	93.5
40	120.0	...	116.0	...	112.6	...	109.8	...	106.8
41	130.0	...	125.7	...	121.9	...	119.0	...	115.7
42	140.0	...	135.4	...	131.3	...	128.1	...	124.6
43	150.0	...	145.1	...	140.7	...	137.3	...	133.5
44	100.0	...	95.4	...	92.7	...	89.4	...	86.7
45	105.0	...	100.2	...	97.2	...	93.9	...	90.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	56.8	55.4	53.7	51.7	49.2	46.3	42.8	38.7	33.9
2	...	56.8	55.4	53.7	51.7	49.2	46.3	42.8	38.7	33.9
3	...	85.3	83.0	80.6	77.6	73.9	69.5	64.1	58.1	50.9
4	...	85.3	83.0	80.6	77.6	73.9	69.5	64.1	58.1	50.9
5	...	89.3	87.1	84.4	81.2	77.4	72.7	67.3	60.8	53.3
6	...	109.6	106.9	103.6	99.7	95.0	89.2	82.6	74.6	65.4
7	...	113.7	110.9	107.4	103.3	98.5	92.5	85.7	77.4	67.8
8	...	25.1	24.8	24.4	24.0	23.6	23.1	22.5	21.7	20.9
9	...	25.1	24.8	24.4	24.0	23.6	23.1	22.5	21.7	20.9
10	...	22.9	22.5	22.2	21.9	21.4	21.0	20.4	19.8	19.0
11	...	24.4	24.0	23.7	23.3	22.9	22.4	21.8	21.1	20.2
12	...	24.4	24.0	23.7	23.3	22.9	22.4	21.8	21.1	20.2
13	...	24.4	24.0	23.7	23.3	22.9	22.4	21.8	21.1	20.2
14	...	24.4	24.0	23.7	23.3	22.9	22.4	21.8	21.1	20.2
15	...	24.4	24.0	23.7	23.3	22.9	22.4	21.8	21.1	20.2
16	27.0	26.6	26.3	25.9	25.5	25.0	24.4	23.7	23.0	22.2
17	27.5	27.1	26.7	26.3	25.9	25.4	24.8	24.2	23.4	22.5
18	28.6	28.2	27.8	27.4	26.9	26.4	25.8	25.1	24.3	23.4
19	25.2	24.9	24.5	24.2	23.8	23.3	22.8	22.2	21.5	20.7
20	29.8	29.4	29.0	28.6	28.1	27.6	26.9	26.2	25.4	24.5
21	30.3	29.8	29.4	29.0	28.5	28.0	27.4	26.6	25.8	24.8
22	30.9	30.5	30.1	29.7	29.2	28.6	27.9	27.2	26.3	25.5
23	32.4	31.8	31.3	30.7	30.0	29.3	28.5	27.6	26.6	25.4
24	32.1	31.6	31.2	30.8	30.3	29.7	29.0	28.2	27.3	26.4
25	33.6	33.0	32.4	31.8	31.1	30.3	29.5	28.6	27.5	26.3
26	33.2	32.7	32.3	31.8	31.3	30.7	30.0	29.2	28.3	27.3
27	...	30.5	30.1	29.6	29.1	28.6	28.0	27.2	26.3	25.3
28	...	30.5	30.1	29.6	29.1	28.6	28.0	27.2	26.3	25.3
29	30.8	30.4	30.0	29.5	29.1	28.5	27.9	27.1	26.3	25.3
30	32.5	32.1	31.6	31.2	30.6	30.1	29.4	28.6	27.7	26.6
31	33.1	32.6	32.2	31.7	31.2	30.6	29.9	29.1	28.2	27.1
32	33.6	33.2	32.7	32.2	31.7	31.1	30.4	29.6	28.6	27.6
33	...	30.5	30.1	29.6	29.1	28.6	28.0	27.2	26.3	25.3
34	...	30.5	30.1	29.6	29.1	28.6	28.0	27.2	26.3	25.3
35	...	73.5	72.3	71.0	69.6	67.9	65.9	63.6	60.8	57.4
36	...	82.1	80.8	79.4	77.7	75.9	73.7	71.1	68.0	64.2
37	...	86.5	85.2	83.6	81.9	79.8	77.4	74.7	71.6	67.8
38	...	90.8	89.3	87.7	85.9	83.9	81.5	78.6	75.2	71.0
39	...	90.8	89.3	87.7	85.9	83.9	81.5	78.6	75.2	71.0
40	...	103.8	102.2	100.3	98.3	95.8	92.9	89.6	85.9	81.4
41	...	112.5	110.8	108.7	106.5	103.7	100.6	97.1	93.1	88.1
42	...	121.1	119.3	117.0	114.7	111.7	108.4	104.6	100.2	94.9
43	...	129.8	127.8	125.4	122.9	119.7	116.1	112.1	107.4	101.7
44	...	82.8	80.2	77.7	...	...	...	...	...	...
45	...	87.0	84.3	81.6	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	K41420	4
2	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	K41420	3
3	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	K41420	2
4	1Cr-1Mn- $\frac{1}{4}$ Mo	Bolting	SA-540	B22	K41420	1
5	1Cr-V	Smls. tube	SA-213	T17	K12047	...
6	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC6	J12072	...
7	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP11	J12072	...
8	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo	Bar	SA-739	B11	K11797	...
9	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11597	1
10	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T11	K11597	...
11	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. & wld. fittings	SA-234	WP11	...	1
12	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P11	K11597	...
13	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11597	1
14	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forged pipe	SA-369	FP11	K11597	...
15	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	1
16	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...
17	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-182	F11	K11572	2
18	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	2
19	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT
20	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT
21	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA/EN 10028-2	13CrMoSi5-5	...	QT
22	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Forgings	SA-336	F11	K11572	3
23	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Plate	SA-387	11	K11789	2
24	$1\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo-Si	Wld. pipe	SA-691	$1\frac{1}{4}$ CR	K11789	...
25	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...
26	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu	Forgings	SA-592	E	K11695	...
27	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...
28	$1\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti	Plate	SA-517	E	K21604	...
29	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	1
30	$2\frac{1}{4}$ Cr-1Mo	Smls. tube	SA-213	T22	K21590	...
31	$2\frac{1}{4}$ Cr-1Mo	Smls. & wld. fittings	SA-234	WP22	K21590	1
32	$2\frac{1}{4}$ Cr-1Mo	Smls. pipe	SA-335	P22	K21590	...
33	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	1
34	$2\frac{1}{4}$ Cr-1Mo	Forged pipe	SA-369	FP22	K21590	...
35	$2\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	1
36	$2\frac{1}{4}$ Cr-1Mo	Wld. pipe	SA-691	$2\frac{1}{4}$ CR	K21590	...
37	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...
38	$2\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT or QT
39	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...
40	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...
41	$2\frac{1}{4}$ Cr-1Mo	Smls. tube	SA/EN 10216-2	10CrMo9-10	...	...
42	$2\frac{1}{4}$ Cr-1Mo	Smls. tube	SA/EN 10216-2	10CrMo9-10	...	...
43	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...
44	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...
45	$2\frac{1}{4}$ Cr-1Mo	Plate	SA/EN 10028-2	10CrMo9-10	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	≤ 4	135	120	...
2	≤ 4	145	130	...
3	≤ 3	155	140	...
4	$\leq 1\frac{1}{2}$	165	150	...
5	...	60	30	...
6	...	70	40	...
7	...	70	40	...
8	...	70	45	...
9	...	60	30	...
10	...	60	30	...
11	...	60	30	...
12	...	60	30	...
13	...	60	30	...
14	...	60	30	...
15	...	60	35	...
16	...	60	35	...
17	...	70	40	...
18	...	70	40	...
19	$4 < t \leq 10$	71	55	...
20	$2.25 < t \leq 4$	72.5	56.5	...
21	≤ 2.25	74	58	...
22	...	75	45	...
23	...	75	45	...
24	...	75	45	...
25	$2\frac{1}{2} < t \leq 4$	105	90	...
26	$\leq 2\frac{1}{2}$	115	100	...
27	$2\frac{1}{2} < t \leq 6$	105	90	...
28	$\leq 2\frac{1}{2}$	115	100	...
29	...	60	30	...
30	...	60	30	...
31	...	60	30	...
32	...	60	30	...
33	...	60	30	...
34	...	60	30	...
35	...	60	30	...
36	...	60	30	...
37	$6 < t \leq 10$	65.5	36.5	...
38	$8 < t \leq 20$	65.5	38.5	...
39	$4 < t \leq 6$	66.5	37.5	...
40	$2.5 < t \leq 4$	68	40.5	...
41	$1\frac{5}{8} < t \leq 2\frac{1}{2}$	69.5	39	...
42	$t \leq 1\frac{5}{8}$	69.5	40.5	...
43	$1.5 < t \leq 2.5$	69.5	42	...
44	$\frac{5}{8} < t \leq 1.5$	69.5	43.5	...
45	$t \leq \frac{5}{8}$	69.5	45	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	120.0	...	114.6	...	110.7	...	107.7	...	104.1
2	130.0	...	124.1	...	120.5	...	116.4	...	112.9
3	140.0	...	133.8	...	129.3	...	125.4	...	121.5
4	150.0	...	143.4	...	138.6	...	134.4	...	130.2
5	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
6	40.0	38.0	36.9	36.0	35.1	...	33.7	...	32.5
7	40.0	38.0	36.9	36.0	35.1	...	33.7	...	32.5
8	45.0	42.8	41.5	40.5	39.5	...	37.9	...	36.5
9	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
10	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
11	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
12	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
13	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
14	30.0	28.5	27.7	27.0	26.3	...	25.3	...	24.4
15	35.0	33.3	32.3	31.5	30.7	...	29.5	...	28.4
16	35.0	33.3	32.3	31.5	30.7	...	29.5	...	28.4
17	40.0	38.0	36.9	36.0	35.1	...	33.7	...	32.5
18	40.0	38.0	36.9	36.0	35.1	...	33.7	...	32.5
19	55.0	53.8	53.0	52.2	51.3	50.5	49.6	48.7	47.8
20	56.5	55.3	54.5	53.6	52.7	51.8	50.9	50.0	49.1
21	58.0	56.7	55.9	55.1	54.2	53.2	52.3	51.3	50.4
22	45.0	42.8	41.5	40.5	39.5	...	37.9	...	36.5
23	45.0	42.8	41.5	40.5	39.5	...	37.9	...	36.5
24	45.0	42.8	41.5	40.5	39.5	...	37.9	...	36.5
25	90.0	87.5	86.0	84.5	83.2	...	81.0	...	79.2
26	100.0	97.2	95.5	93.9	92.5	...	90.0	...	88.0
27	90.0	87.5	86.0	84.5	83.2	...	81.0	...	79.2
28	100.0	97.2	95.5	93.9	92.5	...	90.0	...	88.0
29	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
30	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
31	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
32	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
33	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
34	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
35	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
36	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
37	36.3	34.2	33.2	32.4	31.7	31.2	30.7	30.4	30.0
38	38.4	36.3	35.3	34.4	33.6	33.0	32.5	...	31.8
39	37.7	35.6	34.5	33.7	33.0	32.4	31.9	31.6	31.2
40	40.6	38.3	37.2	36.3	35.5	34.9	34.4	34.0	33.6
41	39.2	37.0	35.9	35.0	34.3	33.7	33.2	32.8	32.4
42	40.6	38.4	37.2	36.3	35.5	34.9	34.4	34.0	33.6
43	42.1	39.7	38.5	37.6	36.8	36.1	35.6	35.2	34.8
44	43.5	41.1	39.8	38.9	38.0	37.4	36.9	36.5	36.1
45	45.0	42.4	41.2	40.1	39.3	38.6	38.1	37.7	37.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	99.3	96.3	93.3	...	...	...	...	...	...
2	...	107.8	104.1	101.1	...	...	...	...	...	...
3	...	116.1	112.1	108.9	...	...	...	...	...	...
4	...	124.2	118.2	114.0	...	...	...	...	...	...
5	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
6	...	31.4	30.8	30.2	29.6	28.8	28.1	27.2	26.2	25.0
7	...	31.4	30.8	30.2	29.6	28.8	28.1	27.2	26.2	25.0
8	...	35.3	34.6	34.0	33.2	32.5	31.6	30.6	29.4	28.2
9	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
10	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
11	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
12	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
13	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
14	...	23.5	23.1	22.6	22.2	21.6	21.0	20.4	19.6	18.8
15	...	27.4	26.9	26.4	25.9	25.2	24.5	23.8	22.9	21.9
16	...	27.4	26.9	26.4	25.9	25.2	24.5	23.8	22.9	21.9
17	...	31.4	30.8	30.2	29.6	28.8	28.1	27.2	26.2	25.0
18	...	31.4	30.8	30.2	29.6	28.8	28.1	27.2	26.2	25.0
19	46.9	45.9	45.0	44.0	43.0	42.0	40.8	39.6	38.2	36.6
20	48.1	47.2	46.2	45.2	44.2	43.1	41.9	40.7	39.2	37.6
21	49.4	48.5	47.5	46.5	45.4	44.3	43.1	41.7	40.3	38.6
22	...	35.3	34.6	34.0	33.2	32.5	31.6	30.6	29.4	28.2
23	...	35.3	34.6	34.0	33.2	32.5	31.6	30.6	29.4	28.2
24	...	35.3	34.6	34.0	33.2	32.5	31.6	30.6	29.4	28.2
25	...	77.7	77.0	76.3	75.6	74.7	73.7	72.5	71.0	69.2
26	...	86.3	85.6	84.8	84.0	83.0	81.9	80.5	78.9	76.8
27	...	77.7	77.0	76.3	75.6	74.7	73.7	72.5	71.0	69.2
28	...	86.3	85.6	84.8	84.0	83.0	81.9	80.5	78.9	76.8
29	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
30	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
31	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
32	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
33	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
34	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
35	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
36	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
37	29.7	29.4	29.1	28.7	28.2	27.7	27.0	26.1	25.1	24.0
38	31.5	31.2	30.9	30.5	30.0	29.3	28.6	27.7	26.6	25.5
39	30.9	30.6	30.3	29.9	29.4	28.8	28.0	27.2	26.1	25.0
40	33.3	33.0	32.6	32.2	31.6	31.0	30.2	29.3	28.2	26.9
41	32.1	31.7	31.4	30.9	30.4	29.8	29.1	28.2	27.1	25.8
42	33.3	32.9	32.5	32.1	31.6	30.9	30.2	29.3	28.2	26.8
43	34.5	34.2	33.8	33.3	32.8	32.1	31.3	30.3	29.2	27.8
44	35.7	35.3	34.9	34.5	33.9	33.2	32.4	31.4	30.2	28.8
45	36.9	36.5	36.1	35.6	35.0	34.3	33.4	32.4	31.2	29.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-217	WC9	J21890	...
2	2 $\frac{1}{4}$ Cr-1Mo	Cast pipe	SA-426	CP22	J21890	...
3	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-182	F22	K21590	3
4	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-336	F22	K21590	3
5	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-387	22	K21590	2
6	2 $\frac{1}{4}$ Cr-1Mo	Wld. pipe	SA-691	2 $\frac{1}{4}$ CR	K21590	...
7	2 $\frac{1}{4}$ Cr-1Mo	Bar	SA-739	B22	K21390	...
8	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA/EN 10222-2	11CrMo9-10	...	NT
9	2 $\frac{1}{4}$ Cr-1Mo	Castings	SA-487	8	J22091	A
10	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-508	22	K21590	3
11	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	3
12	2 $\frac{1}{4}$ Cr-1Mo	Plate	SA-542	B	K21590	4
13	2 $\frac{1}{4}$ Cr-1Mo	Forgings	SA-541	22	K21390	4
14	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-182	F22V	K31835	...
15	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-336	F22V	K31835	...
16	2 $\frac{1}{4}$ Cr-1Mo-V	Forgings	SA-541	22V	K31835	...
17	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-542	D	K31835	4a
18	2 $\frac{1}{4}$ Cr-1Mo-V	Plate	SA-832	22V	K31835	...
19	3Cr-1Mo	Smls. tube	SA-213	F21	K31545	...
20	3Cr-1Mo	Smls. pipe	SA-335	P21	K31545	...
21	3Cr-1Mo	Forgings	SA-336	F21	K31545	1
22	3Cr-1Mo	Forged pipe	SA-369	FP21	K31545	...
23	3Cr-1Mo	Plate	SA-387	21	K31545	1
24	3Cr-1Mo	Cast pipe	SA-426	CP21	J31545	...
25	3Cr-1Mo	Forgings	SA-182	F21	K31545	...
26	3Cr-1Mo	Forgings	SA-336	F21	K31545	3
27	3Cr-1Mo	Plate	SA-387	21	K31545	2
28	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-182	F3V	K31830	...
29	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-336	F3V	K31830	...
30	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-508	3V	K31830	...
31	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Forgings	SA-541	3V	K31830	...
32	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-542	C	K31830	4a
33	3Cr-1Mo- $\frac{1}{4}$ V-Ti-B	Plate	SA-832	21V	K31830	...
34	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-182	F3VCb	...	...
35	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-336	F3VCb	...	...
36	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-508	3VCb	...	...
37	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Forgings	SA-541	3VCb	...	...
38	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-542	E	...	4a
39	3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca	Plate	SA-832	23V	...	...
40	5Cr- $\frac{1}{2}$ Mo	Smls. tube	SA-213	T5	K41545	...
41	5Cr- $\frac{1}{2}$ Mo	Smls. & wld. fittings	SA-234	WP5	K41545	...
42	5Cr- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P5	K41545	...
43	5Cr- $\frac{1}{2}$ Mo	Forged pipe	SA-369	FP5	K41545	...
44	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	1
45	5Cr- $\frac{1}{2}$ Mo	Wld. pipe	SA-691	5CR	K41545	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	70	40	...
2	...	70	40	...
3	...	75	45	...
4	...	75	45	...
5	...	75	45	...
6	...	75	45	...
7	...	75	45	...
8	$t \leq 8$	75.5	45	...
9	...	85	55	...
10	...	85	55	...
11	...	85	55	...
12	...	85	55	...
13	...	105	85	...
14	...	85	60	...
15	...	85	60	...
16	...	85	60	...
17	...	85	60	...
18	...	85	60	...
19	...	60	30	...
20	...	60	30	...
21	...	60	30	...
22	...	60	30	...
23	...	60	30	...
24	...	60	30	...
25	...	75	45	...
26	...	75	45	...
27	...	75	45	...
28	...	85	60	...
29	...	85	60	...
30	...	90	60	...
31	...	85	60	...
32	...	85	60	...
33	...	85	60	...
34	...	85	60	...
35	...	85	60	...
36	...	85	60	...
37	...	85	60	...
38	...	85	60	...
39	...	85	60	...
40	...	60	30	...
41	...	60	30	...
42	...	60	30	...
43	...	60	30	...
44	...	60	30	...
45	...	60	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	40.0	37.9	37.0	36.3	35.8	...	35.1	...	34.4
2	40.0	37.9	37.0	36.3	35.8	...	35.1	...	34.4
3	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
4	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
5	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
6	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
7	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
8	45.0	42.5	41.3	40.2	39.3	38.6	38.1	...	37.2
9	55.0	52.1	50.8	49.9	49.2	...	48.2	...	47.4
10	55.0	...	53.1	...	51.8	...	50.6	...	49.5
11	55.0	...	53.1	...	51.8	...	50.6	...	49.5
12	55.0	...	53.1	...	51.8	...	50.6	...	49.5
13	85.0	...	81.6	...	79.6	...	78.0	...	76.7
14	60.0	...	59.5	...	58.6	...	57.4	...	56.0
15	60.0	...	59.5	...	58.6	...	57.4	...	56.0
16	60.0	...	59.5	...	58.6	...	57.4	...	56.0
17	60.0	...	59.5	...	58.6	...	57.4	...	56.0
18	60.0	...	59.5	...	58.6	...	57.4	...	56.0
19	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
20	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
21	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
22	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
23	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
24	30.0	28.6	28.0	27.6	27.2	...	26.9	...	26.9
25	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
26	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
27	45.0	42.5	41.2	40.2	39.4	...	38.1	...	37.3
28	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
29	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
30	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
31	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
32	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
33	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
34	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
35	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
36	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
37	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
38	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
39	60.0	57.4	56.0	54.8	53.8	...	52.6	...	52.0
40	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
41	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
42	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
43	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
44	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
45	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	33.7	33.3	32.9	32.4	31.8	31.1	30.2	29.1	27.6
2	...	33.7	33.3	32.9	32.4	31.8	31.1	30.2	29.1	27.6
3	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
4	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
5	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
6	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
7	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
8	36.9	36.5	36.1	35.6	35.0	34.3	33.4	32.4	31.2	29.8
9	...	46.4	45.9	45.3	44.6	43.8	42.8	41.6	40.0	38.0
10	...	48.2	47.5	46.8	46.0	45.2	44.2	...	...	...
11	...	48.2	47.5	46.8	46.0	45.2	44.2	...	...	...
12	...	48.2	47.5	46.8	46.0	45.2	44.2	...	...	...
13	...	75.2	74.4	73.4	72.3	71.0	69.4	67.6	65.4	63.0
14	...	54.2	53.3	52.3	51.2	50.1	49.0	47.8	...	...
15	...	54.2	53.3	52.3	51.2	50.1	49.0	47.8	...	...
16	...	54.2	53.3	52.3	51.2	50.1	49.0	47.8	...	...
17	...	54.2	53.3	52.3	51.2	50.1	49.0	47.8	...	...
18	...	54.2	53.3	52.3	51.2	50.1	49.0	47.8	...	...
19	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
20	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
21	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
22	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
23	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
24	...	26.9	26.9	26.9	26.8	26.6	26.2	25.6	24.8	23.7
25	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
26	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
27	...	36.5	36.1	35.6	35.0	34.3	33.5	32.4	31.2	29.7
28	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
29	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
30	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
31	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
32	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
33	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
34	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
35	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
36	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
37	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
38	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
39	...	51.7	51.4	51.2	50.8	50.3	49.5	48.5	...	...
40	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
41	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
42	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
43	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
44	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
45	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
	Ferrous Materials (Cont'd)					
1	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5	K41545	...
2	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5	K41545	...
3	5Cr- $\frac{1}{2}$ Mo	Plate	SA-387	5	K41545	2
4	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-336	F5A	K42544	...
5	5Cr- $\frac{1}{2}$ Mo	Castings	SA-217	C5	J42045	...
6	5Cr- $\frac{1}{2}$ Mo	Cast pipe	SA-426	CP5	J42045	...
7	5Cr- $\frac{1}{2}$ Mo	Forgings	SA-182	F5a	K42544	...
8	5Cr- $\frac{1}{2}$ Mo	Bolting	SA-193	B5	K50100	...
9	5Cr- $\frac{1}{2}$ Mo-Si	Smls. tube	SA-213	T5b	K51545	...
10	5Cr- $\frac{1}{2}$ Mo-Si	Smls. pipe	SA-335	P5b	K51545	...
11	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. tube	SA-213	T5c	K41245	...
12	5Cr- $\frac{1}{2}$ Mo-Ti	Smls. pipe	SA-335	P5c	K41245	...
13	9Cr-1Mo	Smls. tube	SA-213	T9	K90941	...
14	9Cr-1Mo	Fittings	SA-234	WP9	K90941	...
15	9Cr-1Mo	Smls. pipe	SA-335	P9	K90941	...
16	9Cr-1Mo	Forged pipe	SA-369	FP9	K90941	...
17	9Cr-1Mo	Forgings	SA-182	F9	K90941	...
18	9Cr-1Mo	Forgings	SA-336	F9	K90941	...
19	9Cr-1Mo	Castings	SA-217	C12	J82090	...
20	9Cr-1Mo	Cast pipe	SA-426	CP9	J82090	...
21	9Cr-1Mo-V	Smls. tube	SA-213	T91 Types 1 & 2	K90901	...
22	9Cr-1Mo-V	Fittings	SA-234	WP91 Types 1 & 2	K90901	...
23	9Cr-1Mo-V	Smls. pipe	SA-335	P91 Types 1 & 2	K90901	...
24	9Cr-1Mo-V	Forged pipe	SA-369	FP91 Types 1 & 2	K90901	...
25	9Cr-1Mo-V	Plate	SA-387	91 Types 1 & 2	K90901	2
26	9Cr-1Mo-V	Forgings	SA-182	F91 Types 1 & 2	K90901	...
27	9Cr-1Mo-V	Forgings	SA-336	F91 Types 1 & 2	K90901	...
28	11Cr-Ti	Plate	SA-240	...	S40910	...
29	11Cr-Ti	Plate	SA-240	...	S40920	...
30	11Cr-Ti	Plate	SA-240	...	S40930	...
31	11Cr-Ti	Smls. & wld. tube	SA-268	TP409	S40900	...
32	12Cr	Plate	SA-1010	40	S41003	...
33	12Cr	Bar	SA-479	403	S40300	A
34	12Cr	Bar	SA-479	403	S40300	1
35	12Cr	Plate	SA-1010	50	S41003	...
36	12Cr-Al	Plate	SA-240	405	S40500	...
37	12Cr-Al	Bar	SA-479	405	S40500	...
38	12Cr-Al	Bar	SA/JIS G4303	SUS405	...	...
39	12Cr-Al	Smls. & wld. tube	SA-268	TP405	S40500	...
40	12Cr-1Mo-V-W	Bolting	SA-437	B4C	K91352	...
41	12Cr-1Mo-V-W	Bolting	SA-437	B4B	K91352	...
42	12Cr-9Ni-2Cu-1Ti	Bar	SA-564	XM-16	S45500	H1000
43	12Cr-9Ni-2Cu-1Ti	Forgings	SA-705	XM-16	S45500	H1000
44	12Cr-9Ni-2Cu-1Ti	Bar	SA-564	XM-16	S45500	H950
45	12Cr-9Ni-2Cu-1Ti	Forgings	SA-705	XM-16	S45500	H950

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	60	36	...
2	...	70	40	...
3	...	75	45	...
4	...	80	50	...
5	...	90	60	...
6	...	90	60	...
7	...	90	65	...
8	≤ 4	100	80	...
9	...	60	30	...
10	...	60	30	...
11	...	60	30	...
12	...	60	30	...
13	...	60	30	...
14	...	60	30	...
15	...	60	30	...
16	...	60	30	...
17	...	85	55	...
18	...	85	55	...
19	...	90	60	...
20	...	90	60	...
21	...	85	60	...
22	...	90	60	...
23	...	85	60	...
24	...	85	60	...
25	...	85	60	...
26	...	90	60	...
27	...	90	60	...
28	...	55	25	...
29	...	55	25	...
30	...	55	25	...
31	...	55	25	...
32	$\leq \frac{3}{4}$	66	40	...
33	...	70	40	...
34	...	70	40	...
35	$\leq \frac{3}{4}$	70	50	...
36	...	60	25	...
37	...	60	25	...
38	...	60	25	...
39	...	60	30	...
40	...	115	85	...
41	...	145	105	...
42	...	205	185	...
43	$\geq \frac{1}{2}$	205	185	...
44	...	220	205	...
45	$\geq \frac{1}{2}$	220	205	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	36.0	33.6	32.5	31.8	31.4	...	30.9	...	30.7
2	40.0	37.3	36.2	35.4	34.8	...	34.4	...	34.1
3	45.0	42.0	40.7	39.8	39.2	...	38.7	...	38.4
4	50.0	46.7	45.2	44.2	43.6	...	42.9	...	42.6
5	60.0	56.0	54.2	53.0	52.3	...	51.5	...	51.2
6	60.0	56.0	54.2	53.0	52.3	...	51.5	...	51.2
7	65.0	60.7	58.8	57.5	56.6	...	55.8	...	55.4
8	80.0	...	71.1	...	68.9	...	68.7	...	68.7
9	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
10	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
11	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
12	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
13	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
14	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
15	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
16	30.0	28.0	27.1	26.5	26.1	...	25.8	...	25.6
17	55.0	51.3	49.7	48.6	47.9	...	47.2	...	46.9
18	55.0	51.3	49.7	48.6	47.9	...	47.2	...	46.9
19	60.0	56.0	54.2	53.0	52.3	...	51.5	...	51.2
20	60.0	56.0	54.2	53.0	52.3	...	51.5	...	51.2
21	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
22	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
23	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
24	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
25	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
26	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
27	60.0	57.1	55.9	55.2	54.8	...	54.7	...	54.7
28	25.0	23.0	21.7	20.6	19.6	...	18.1	...	17.3
29	25.0	23.0	21.7	20.6	19.6	...	18.1	...	17.3
30	25.0	23.0	21.7	20.6	19.6	...	18.1	...	17.3
31	25.0	23.0	21.7	20.6	19.6	...	18.1	...	17.3
32	40.0	...	40.0	...	36.7	...	33.9	...	32.3
33	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
34	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
35	50.0	...	50.0	...	45.9	...	42.4	...	40.3
36	25.0	23.6	23.0	22.5	22.2	...	21.8	...	21.5
37	25.0	23.6	23.0	22.5	22.2	...	21.8	...	21.5
38	25.0	23.6	23.0	22.5	22.2	...	21.8	...	21.5
39	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
40	85.0	...	81.6	...	78.9	...	76.8	...	75.0
41	105.0	...	100.5	...	97.2	...	94.8	...	92.7
42	185.0	...	...	...	...	...	...	...	...
43	185.0	...	...	...	...	...	...	...	...
44	205.0	...	...	...	...	...	...	...	...
45	205.0	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	30.3	29.9	29.3	28.6	27.7	26.6	25.3	23.8	22.2
2	...	33.6	33.2	32.6	31.8	30.8	29.6	28.1	26.5	24.6
3	...	37.8	37.4	36.7	35.8	34.6	33.3	31.6	29.8	27.7
4	...	42.0	41.5	40.8	39.8	38.5	36.9	35.1	33.1	30.8
5	...	50.5	49.8	48.9	47.7	46.2	44.3	42.2	39.7	36.9
6	...	50.5	49.8	48.9	47.7	46.2	44.3	42.2	39.7	36.9
7	...	54.7	54.0	53.0	51.7	50.0	48.0	45.7	43.0	40.0
8	...	68.6	67.9	66.7	65.1	62.9	60.3	57.1	53.6	49.7
9	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
10	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
11	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
12	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
13	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
14	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
15	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
16	...	25.2	24.9	24.5	23.9	23.1	22.2	21.1	19.8	18.5
17	...	46.2	45.7	44.8	43.7	42.3	40.6	38.6	36.4	33.9
18	...	46.2	45.7	44.8	43.7	42.3	40.6	38.6	36.4	33.9
19	...	50.5	49.8	48.9	47.7	46.2	44.3	42.2	39.7	36.9
20	...	50.5	49.8	48.9	47.7	46.2	44.3	42.2	39.7	36.9
21	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
22	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
23	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
24	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
25	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
26	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
27	...	54.5	54.0	53.2	52.0	50.4	48.5	46.1	43.4	40.2
28	...	17.0	16.9	16.9	16.8	16.6	16.3	15.9	15.3	14.5
29	...	17.0	16.9	16.9	16.8	16.6	16.3	15.9	15.3	14.5
30	...	17.0	16.9	16.9	16.8	16.6	16.3	15.9	15.3	14.5
31	...	17.0	16.9	16.9	16.8	16.6	16.3	15.9	15.3	14.5
32	...	31.1	30.4	29.4	28.1	26.5	24.7	22.9	21.5	21.2
33	...	33.7	33.1	32.4	31.4	30.2	28.8	27.1	25.2	23.0
34	...	33.7	33.1	32.4	31.4	30.2	28.8	27.1	25.2	23.0
35	...	38.9	38.0	36.8	35.1	33.1	30.9	28.6	26.9	26.5
36	...	21.0	20.7	20.2	19.6	18.9	18.0	16.9	15.7	14.4
37	...	21.0	20.7	20.2	19.6	18.9	18.0	16.9	15.7	14.4
38	...	21.0	20.7	20.2	19.6	18.9	18.0	16.9	15.7	14.4
39	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
40	...	73.8	72.9	72.0	...	...	...	...	...	...
41	...	90.6	89.7	89.1	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	12Cr-9Ni-2Cu-1Ti	Bar	SA-564	XM-16	S45500	H900
2	12Cr-9Ni-2Cu-1Ti	Forgings	SA-705	XM-16	S45500	H900
3	12Cr-Ti	Smls. & wld. tube	SA-268	...	S40800	...
4	13Cr	Plate	SA-240	410S	S41008	...
5	13Cr	Smls. & wld. tube	SA-268	TP410	S41000	...
6	13Cr	Plate	SA-240	410	S41000	...
7	13Cr	Forgings	SA-182	F6a	S41000	1
8	13Cr	Bar	SA-479	410	S41000	...
9	13Cr	Bar	SA-479	410	S41000	A
10	13Cr	Bar	SA-479	410	S41000	1
11	13Cr	Forgings	SA-182	F6a	S41000	2
12	13Cr	Castings	SA-217	CA15	J91150	...
13	13Cr	Cast pipe	SA-426	CPCA15	J91150	...
14	13Cr	Bar	SA/EN 10088-3	X12Cr13	...	QT650
15	13Cr	Bolting	SA-193	B6	S41000	...
16	13Cr-4Ni	Castings	SA-487	CA6NM	J91540	A
17	13Cr-4Ni	Forgings	SA-182	F6NM	S41500	...
18	13Cr-4Ni	Bar	SA-479	...	S41500	...
19	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1150M
20	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1150M
21	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1150
22	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1150
23	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1100
24	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1100
25	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1050
26	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1050
27	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1025
28	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1025
29	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H1000
30	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H1000
31	13Cr-8Ni-2Mo	Bar	SA-564	XM-13	S13800	H950
32	13Cr-8Ni-2Mo	Forgings	SA-705	XM-13	S13800	H950
33	15Cr	Smls. & wld. tube	SA-268	TP429	S42900	...
34	15Cr	Plate	SA-240	429	S42900	...
35	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1150M
36	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1150M
37	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1150
38	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1150
39	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1100
40	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1100
41	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1075
42	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1075
43	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H1025
44	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H1025
45	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H925

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	235	220	...
2	$\geq 1/2$	235	220	...
3	...	55	30	...
4	...	60	30	...
5	...	60	30	...
6	...	65	30	...
7	...	70	40	...
8	...	70	40	...
9	...	70	40	...
10	...	70	40	...
11	...	85	55	...
12	...	90	65	...
13	...	90	65	...
14	$t \leq 6.25$	94.5	65.5	...
15	≤ 4	110	85	...
16	...	110	80	...
17	...	115	90	...
18	...	115	90	...
19	...	125	85	...
20	...	125	85	...
21	...	135	90	...
22	...	135	90	...
23	...	150	135	...
24	...	150	135	...
25	...	175	165	...
26	...	175	165	...
27	...	185	175	...
28	...	185	175	...
29	...	205	190	...
30	...	205	190	...
31	...	220	205	...
32	...	220	205	...
33	...	60	35	...
34	...	65	30	...
35	...	115	75	...
36	...	115	75	...
37	...	135	105	...
38	...	135	105	...
39	...	140	115	...
40	...	140	115	...
41	...	145	125	...
42	...	145	125	...
43	...	155	145	...
44	...	155	145	...
45	...	170	155	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	220.0	...	...	...	...	...	...	...	...
2	220.0	...	...	...	...	...	...	...	...
3	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
4	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
5	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
6	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
7	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
8	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
9	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
10	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
11	55.0	52.0	50.6	49.6	48.8	...	48.0	...	47.3
12	65.0	61.4	59.8	58.6	57.7	...	56.7	...	55.9
13	65.0	61.4	59.8	58.6	57.7	...	56.7	...	55.9
14	65.3	62.0	60.4	59.1	58.1	57.3	56.8	...	56.0
15	85.0	...	78.0	...	75.0	...	73.6	...	72.8
16	80.0	76.9	75.3	73.9	72.9	...	71.3	...	70.3
17	90.0	87.7	86.5	85.5	84.6	...	82.8	...	80.8
18	90.0	87.7	86.5	85.5	84.6	...	82.8	...	80.8
19	85.0	...	...	...	...	...	...	...	...
20	85.0	...	...	...	...	...	...	...	...
21	90.0	...	...	...	...	...	...	...	...
22	90.0	...	...	...	...	...	...	...	...
23	135.0	...	...	...	...	...	...	...	...
24	135.0	...	...	...	...	...	...	...	...
25	165.0	...	...	...	...	...	...	...	...
26	165.0	...	...	...	...	...	...	...	...
27	175.0	...	...	...	...	...	...	...	...
28	175.0	...	...	...	...	...	...	...	...
29	190.0	...	...	...	...	...	...	...	...
30	190.0	...	...	...	...	...	...	...	...
31	205.0	...	...	...	...	...	...	...	...
32	205.0	...	...	...	...	...	...	...	...
33	35.0	33.1	32.2	31.5	31.1	...	30.5	...	30.1
34	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
35	75.0	...	...	...	...	...	...	...	...
36	75.0	...	...	...	...	...	...	...	...
37	105.0	...	...	...	...	...	...	...	...
38	105.0	...	...	...	...	...	...	...	...
39	115.0	...	107.1	...	103.2	...	100.5	...	98.1
40	115.0	...	107.1	...	103.2	...	100.5	...	98.1
41	125.0	119.1	116.4	114.1	112.3	110.7	109.2	107.9	106.6
42	125.0	119.1	116.4	114.1	112.3	110.7	109.2	107.9	106.6
43	145.0	138.2	135.0	132.4	130.2	128.4	126.7	125.2	123.7
44	145.0	138.2	135.0	132.4	130.2	128.4	126.7	125.2	123.7
45	155.0	147.7	144.3	141.5	139.2	137.2	135.5	133.8	132.2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
4	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
5	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
6	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
7	...	33.7	33.1	32.4	31.4	30.2	28.8	27.1	25.2	23.0
8	...	33.7	33.1	32.4	31.4	30.2	28.8	27.1	25.2	23.0
9	...	33.7	33.1	32.4	...	...	...	...	...	...
10	...	33.7	33.1	32.4	...	...	...	...	...	...
11	...	46.3	45.5	44.5	43.2	41.6	39.6	37.3	34.6	31.6
12	...	54.7	53.8	52.6	51.0	49.1	46.8	44.0	40.9	37.3
13	...	54.7	53.8	52.6	...	...	...	...	...	...
14	55.6	55.0	54.2	53.0	51.4	49.4	47.0	44.2	41.0	37.7
15	...	71.7	70.7	69.4	67.6	65.2	62.3	58.7	54.6	49.9
16	...	69.1	68.2	67.0	65.4	63.4	...	...	...	...
17	...	78.5	77.2	75.7	...	...	...	...	...	...
18	...	78.5	77.2	75.7	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	29.5	29.0	28.3	27.5	26.4	25.2	23.7	22.0	20.1
34	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	96.8	...	...	...	...	...	...	...	...	...
40	96.8	...	...	...	...	...	...	...	...	...
41	105.2	103.7	101.5	99.8	...	...	...	...	...	...
42	105.2	103.7	101.5	99.8	...	...	...	...	...	...
43	122.1	120.3	117.7	115.8	...	...	...	...	...	...
44	122.1	120.3	117.7	115.8	...	...	...	...	...	...
45	130.5	128.6	125.9	123.8	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H925
2	15Cr-5Ni-3Cu	Bar	SA-564	XM-12	S15500	H900
3	15Cr-5Ni-3Cu	Forgings	SA-705	XM-12	S15500	H900
4	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1150
5	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1150
6	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1100
7	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1100
8	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1050
9	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1050
10	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1025
11	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1025
12	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H1000
13	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H1000
14	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H950
15	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H950
16	15Cr-6Ni-Cu-Mo	Bar	SA-564	XM-25	S45000	H900
17	15Cr-6Ni-Cu-Mo	Forgings	SA-705	XM-25	S45000	H900
18	17Cr	Smls. & wld. tube	SA-268	TP430	S43000	...
19	17Cr	Plate	SA-240	430	S43000	...
20	17Cr	Bar	SA-479	430	S43000	...
21	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1150M
22	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1150M
23	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1150
24	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1150
25	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1150
26	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1100
27	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1100
28	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1100
29	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1075
30	17Cr-4Ni-4Cu	Plate	SA-693	630	S17400	H1075
31	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1075
32	17Cr-4Ni-4Cu	Bar	SA-564	630	S17400	H1025
33	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H1025
34	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H925
35	17Cr-4Ni-4Cu	Forgings	SA-705	630	S17400	H900
36	17Cr-7Ni-1Al	Forgings	SA-705	631	S17700	TH1050
37	17Cr-7Ni-1Al	Forgings	SA-705	631	S17700	RH950
38	18Cr-2Mo	Plate	SA-240	...	S44400	...
39	18Cr-2Mo	Smls. & wld. tube	SA-268	...	S44400	...
(23) 40	18Cr-Ti	Plate	SA-240	...	S43932	...
41	18Cr-Ti	Smls. & wld. tube	SA-268	TP439	S43035	...
42	18Cr-Ti	Wld. tube	SA-803	TP439	S43035	...
43	18Cr-Ti	Smls. & wld. pipe	SA-731	TP439	S43035	...
44	18Cr-Ti	Smls. & wld. tube	SA-268	TP430 Ti	S43036	...
45	18Cr-Ti	Bar	SA-479	439	S43035	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	170	155	...
2	...	190	170	...
3	...	190	170	...
4	...	125	75	...
5	$\geq \frac{1}{2}$	125	75	...
6	...	130	105	...
7	$\geq \frac{1}{2}$	130	105	...
8	...	145	135	...
9	$\geq \frac{1}{2}$	145	135	...
10	...	150	140	...
11	$\geq \frac{1}{2}$	150	140	...
12	...	160	150	...
13	$\geq \frac{1}{2}$	160	150	...
14	...	170	160	...
15	$\geq \frac{1}{2}$	170	160	...
16	...	180	170	...
17	$\geq \frac{1}{2}$	180	170	...
18	...	60	35	...
19	...	65	30	...
20	...	70	40	...
21	...	115	75	...
22	...	115	75	...
23	...	135	105	...
24	...	135	105	...
25	...	135	105	...
26	...	140	115	...
27	...	140	115	...
28	...	140	115	...
29	...	145	125	...
30	...	145	125	...
31	...	145	125	...
32	...	155	145	...
33	...	155	145	...
34	...	170	155	...
35	...	190	170	...
36	...	170	140	...
37	...	185	150	...
38	...	60	40	...
39	...	60	40	...
40	...	60	30	...
41	...	60	30	...
42	...	60	30	...
43	...	60	30	...
44	...	60	35	...
45	...	70	40	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
	Ferrous Materials (Cont'd)								
1	155.0	147.7	144.3	141.5	139.2	137.2	135.5	133.8	132.2
2	170.0	162.0	158.2	155.2	152.7	150.5	148.6	146.8	145.0
3	170.0	162.0	158.2	155.2	152.7	150.5	148.6	146.8	145.0
4	75.0	...	...	...	...	...	...	...	...
5	75.0	...	...	...	...	...	...	...	...
6	105.0	...	...	...	...	...	...	...	...
7	105.0	...	...	...	...	...	...	...	...
8	135.0	...	...	...	...	...	...	...	...
9	135.0	...	...	...	...	...	...	...	...
10	140.0	...	...	...	...	...	...	...	...
11	140.0	...	...	...	...	...	...	...	...
12	150.0	...	...	...	...	...	...	...	...
13	150.0	...	...	...	...	...	...	...	...
14	160.0	...	...	...	...	...	...	...	...
15	160.0	...	...	...	...	...	...	...	...
16	170.0	...	...	...	...	...	...	...	...
17	170.0	...	...	...	...	...	...	...	...
18	35.0	33.1	32.2	31.5	31.1	...	30.5	...	30.1
19	30.0	28.4	27.6	27.0	26.6	...	26.2	...	25.8
20	40.0	37.8	36.8	36.0	35.5	...	34.9	...	34.4
21	75.0	71.2	69.4	67.8	66.4	...	64.1	...	62.1
22	75.0	71.2	69.4	67.8	66.4	...	64.1	...	62.1
23	105.0	99.7	97.1	94.9	93.0	...	89.7	...	87.0
24	105.0	99.7	97.1	94.9	93.0	...	89.7	...	87.0
25	105.0	99.7	97.1	94.9	93.0	...	89.7	...	87.0
26	115.0	109.2	106.3	103.9	101.8	...	98.3	...	95.2
27	115.0	109.2	106.3	103.9	101.8	...	98.3	...	95.2
28	115.0	109.2	106.3	103.9	101.8	...	98.3	...	95.2
29	125.0	118.7	115.6	113.0	110.7	...	106.8	...	103.5
30	125.0	118.7	115.6	113.0	110.7	...	106.8	...	103.5
31	125.0	118.7	115.6	113.0	110.7	...	106.8	...	103.5
32	145.0	...	134.1	...	128.4	...	123.9	...	120.1
33	145.0	137.7	134.1	131.0	128.4	...	123.9	...	120.1
34	155.0	147.2	143.3	140.1	137.3	...	132.4	...	128.4
35	170.0	161.5	157.2	153.6	150.5	...	145.2	...	140.8
36	140.0	...	...	...	...	...	...	...	...
37	150.0	...	...	...	...	...	...	...	...
38	40.0	36.5	34.8	33.5	32.4	...	30.8	...	29.4
39	40.0	36.5	34.8	33.5	32.4	...	30.8	...	29.4
40	30.0	27.4	25.9	24.6	23.5	...	21.9	...	20.9
41	30.0	27.4	25.9	24.6	23.5	...	21.9	...	20.9
42	30.0	27.4	25.9	24.6	23.5	...	21.9	...	20.9
43	30.0	27.4	25.9	24.6	23.5	...	21.9	...	20.9
44	35.0	...	30.2	...	27.4	...	25.5	...	24.4
45	40.0	36.5	34.6	32.8	31.3	...	29.1	...	27.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	130.5	128.6	125.9	123.8	...	...	...	...	...	...
2	143.1	141.0	138.0	135.7	...	...	...	...	...	...
3	143.1	141.0	138.0	135.7	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	29.5	29.0	28.3	27.5	26.4	25.2	23.7	22.0	20.1
19	...	25.3	24.8	24.3	23.6	22.7	21.6	20.3	18.9	17.2
20	...	33.7	33.1	32.4	31.4	30.2	28.8	27.1	25.2	23.0
21	...	60.5	...	...	...	...	...	...	...	...
22	...	60.5	...	...	...	...	...	...	...	...
23	...	84.7	83.6	82.5	81.1	79.4	76.9	73.2	67.9	60.2
24	...	84.7	83.6	82.5	81.1	79.4	76.9	73.2	67.9	60.2
25	...	84.7	83.6	82.5	81.1	79.4	76.9	73.2	67.9	60.2
26	...	92.7	91.5	90.3	88.9	86.9	84.2	80.2	74.4	66.0
27	...	92.7	91.5	90.3	88.9	86.9	84.2	80.2	74.4	66.0
28	...	92.7	91.5	90.3	88.9	86.9	84.2	80.2	74.4	66.0
29	...	100.8	99.5	98.2	96.6	94.5	91.5	87.2	80.8	71.7
30	...	100.8	99.5	98.2	96.6	94.5	91.5	87.2	80.8	71.7
31	...	100.8	99.5	98.2	96.6	94.5	91.5	87.2	80.8	71.7
32	118.4	...	...	...	...	...	...	...	...	...
33	118.4	116.9	115.4	113.9	...	...	...	...	...	...
34	...	125.0	123.4	121.7	...	...	...	...	...	...
35	...	137.1	135.3	133.5	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	28.0	27.3	26.6	25.9	25.1	24.2	23.2	22.1	20.7
39	...	28.0	27.3	26.6	25.9	25.1	24.2	23.2	22.1	20.7
40	...	20.5	20.3	20.2	20.1	19.8	19.4	18.8	17.9	16.6
41	...	20.5	20.3	20.2	20.1	19.8	19.4	18.8	17.9	16.6
42	...	20.5	20.3	20.2	20.1	19.8	19.4	18.8	17.9	16.6
43	...	20.5	20.3	20.2	20.1	19.8	19.4	18.8	17.9	16.6
44	...	23.9	23.7	23.6	23.4	23.1	22.6	21.9	20.9	...
45	...	27.3	27.1	26.9	26.7	26.4	25.9	25.0	23.8	22.2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	26Cr-3Ni-3Mo	Plate	SA-240	26-3-3	S44660	...
2	26Cr-3Ni-3Mo	Smls. & wld. tube	SA-268	26-3-3	S44660	...
3	26Cr-3Ni-3Mo	Wld. tube	SA-803	26-3-3	S44660	...
4	27Cr	Smls. tube	SA-268	TP446-1	S44600	...
5	27Cr-1Mo	Forgings	SA-182	FXM-27Cb	S44627	...
6	27Cr-1Mo	Plate	SA-240	XM-27	S44627	...
7	27Cr-1Mo	Smls. & wld. tube	SA-268	TPXM-27	S44627	...
8	27Cr-1Mo	Bar	SA-479	XM-27	S44627	...
9	27Cr-1Mo	Smls. & wld. pipe	SA-731	TPXM-27	S44627	...
10	27Cr-1Mo-Ti	Smls. & wld. pipe	SA-731	TPXM-33	S44626	...
11	27Cr-1Mo-Ti	Plate	SA-240	XM-33	S44626	...
12	27Cr-1Mo-Ti	Smls. & wld. tube	SA-268	TPXM-33	S44626	...
13	29Cr-4Mo	Bar	SA-479	...	S44700	...
14	29Cr-4Mo	Plate	SA-240	...	S44700	...
15	29Cr-4Mo	Smls. & wld. tube	SA-268	29-4	S44700	...
16	29Cr-4Mo-2Ni	Bar	SA-479	...	S44800	...
17	29Cr-4Mo-2Ni	Plate	SA-240	...	S44800	...
18	29Cr-4Mo-2Ni	Smls. & wld. tube	SA-268	29-4-2	S44800	...
19	29Cr-4Mo-Ti	Smls. & wld. tube	SA-268	...	S44735	...
20	Mn- $\frac{1}{4}$ Mo	Forgings	SA-372	D	K14508	...
21	Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	A
22	Mn- $\frac{1}{4}$ Mo-V	Castings	SA-487	2	J13005	B
23	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	A	K12021	...
24	Mn- $\frac{1}{2}$ Mo	Wld. pipe	SA-672	H75	K12021	...
25	Mn- $\frac{1}{2}$ Mo	Plate	SA-302	B	K12022	...
26	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	1
27	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	2
28	Mn- $\frac{1}{2}$ Mo	Plate	SA-533	A	K12521	3
29	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	1
30	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	2
31	Mn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ Ni	Plate	SA-533	D	K12529	3
32	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-302	C	K12039	...
33	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	1
34	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	H80	K12039	...
35	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J80	K12539	...
36	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	2
37	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J90	K12539	...
38	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Plate	SA-533	B	K12539	3
39	Mn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ Ni	Wld. pipe	SA-672	J100	K12539	...
40	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-302	D	K12054	...
41	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	1
42	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	1
43	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	2
44	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	E	K12554	2
45	Mn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ Ni	Plate	SA-533	C	K12554	3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	$\leq 2/10$	85	65	...
2	$\leq 2/10$	85	65	...
3	$\leq 2/10$	85	65	...
4	...	70	40	...
5	...	60	35	...
6	...	65	40	...
7	...	65	40	...
8	...	65	40	...
9	...	65	40	...
10	...	65	40	...
11	...	68	45	...
12	...	68	45	...
13	...	70	55	...
14	...	80	60	...
15	...	80	60	...
16	...	70	55	...
17	...	80	60	...
18	...	80	60	...
19	...	75	60	...
20	...	105	65	...
21	...	85	53	...
22	...	90	65	...
23	...	75	45	...
24	...	75	45	...
25	...	80	50	...
26	...	80	50	...
27	...	90	70	...
28	...	100	83	...
29	...	80	50	...
30	...	90	70	...
31	...	100	83	...
32	...	80	50	...
33	...	80	50	...
34	...	80	50	...
35	...	80	50	...
36	...	90	70	...
37	...	90	70	...
38	...	100	83	...
39	...	100	83	...
40	...	80	50	...
41	...	80	50	...
42	...	80	50	...
43	...	90	70	...
44	...	90	70	...
45	...	100	83	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	65.0	60.6	58.3	56.4	54.7	...	52.3	...	50.6
2	65.0	60.6	58.3	56.4	54.7	...	52.3	...	50.6
3	65.0	60.6	58.3	56.4	54.7	...	52.3	...	50.6
4	40.0	36.5	34.6	32.8	31.3	...	29.1	...	27.9
5	35.0	32.1	30.3	28.8	27.6	...	25.7	...	24.8
6	40.0	36.6	34.5	32.8	31.3	...	29.3	...	28.3
7	40.0	36.6	34.5	32.8	31.3	...	29.3	...	28.3
8	40.0	36.6	34.5	32.8	31.3	...	29.3	...	28.3
9	40.0	36.6	34.5	32.8	31.3	...	29.3	...	28.3
10	40.0	36.9	35.1	33.4	31.9	...	29.4	...	27.7
11	45.0	41.5	39.5	37.6	35.9	...	33.1	...	31.1
12	45.0	41.5	39.5	37.6	35.9	...	33.1	...	31.1
13	55.0	50.8	48.4	46.4	44.7	...	42.6	...	41.6
14	60.0	55.4	52.8	50.6	48.8	...	46.4	...	45.4
15	60.0	55.4	52.8	50.6	48.8	...	46.4	...	45.4
16	55.0	49.0	45.8	43.0	40.7	...	36.9	...	34.3
17	60.0	53.4	49.9	47.0	44.4	...	40.2	...	37.4
18	60.0	53.4	49.9	47.0	44.4	...	40.2	...	37.4
19	60.0	53.4	49.9	47.0	44.4	...	40.2	...	37.4
20	65.0	62.8	61.5	60.4	59.6	...	58.6	...	58.2
21	53.0	51.2	50.4	49.4	48.2	...	45.2	...	42.4
22	65.0	62.8	61.8	60.6	59.1	...	55.4	...	52.0
23	45.0	43.3	42.3	41.6	40.9	...	39.8	...	38.8
24	45.0	43.3	42.3	41.6	40.9	...	39.8	...	38.8
25	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
26	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
27	70.0	67.3	65.9	64.7	63.7	...	61.9	...	60.4
28	83.0	79.8	78.1	76.7	75.5	...	73.4	...	71.6
29	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
30	70.0	67.3	65.9	64.7	63.7	...	61.9	...	60.4
31	83.0	79.8	78.1	76.7	75.5	...	73.4	...	71.6
32	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
33	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
34	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
35	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
36	70.0	67.3	65.9	64.7	63.7	...	61.9	...	60.4
37	70.0	67.3	65.9	64.7	63.7	...	61.9	...	60.4
38	83.0	79.8	78.1	76.7	75.5	...	73.4	...	71.6
39	83.0	79.8	78.1	76.7	75.5	...	73.4	...	71.6
40	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
41	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
42	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
43	70.0	67.3	65.9	64.7	63.7	...	61.9	...	60.4
44	70.0	67.3	65.9	64.7	63.7	...	61.9	...	60.4
45	83.0	79.8	78.1	76.7	75.5	...	73.4	...	71.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	49.7	49.5	49.3	...	...	...	...	...	...
2	...	49.7	49.5	49.3	...	...	...	...	...	...
3	...	49.7	49.5	49.3	...	...	...	...	...	...
4	...	27.3	27.1	26.9	26.7	26.4	25.9	25.0	23.8	22.2
5	...	24.6	24.6	...	...	...	...	...	...	...
6	...	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
7	...	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
8	...	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
9	...	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
10	...	26.7	26.4	26.4	...	...	...	...	...	...
11	...	30.0	29.7	29.6	...	...	...	...	...	...
12	...	30.0	29.7	29.6	...	...	...	...	...	...
13	...	41.3	41.1	40.6	39.7	...	...	...	...	...
14	...	45.0	44.8	44.3	43.3	...	...	...	...	...
15	...	45.0	44.8	44.3	43.3	...	...	...	...	...
16	...	32.9	32.6	32.4	32.1	...	...	...	...	...
17	...	35.9	35.6	35.3	35.0	...	...	...	...	...
18	...	35.9	35.6	35.3	35.0	...	...	...	...	...
19	...	35.9	35.6	35.3	35.0	...	...	...	...	...
20	...	57.6	57.0	56.0	54.7	53.0	50.9	48.5	45.8	43.1
21	...	40.9	40.5	39.8	...	...	...	...	...	...
22	...	50.2	49.7	48.8	...	...	...	...	...	...
23	...	37.9	37.3	36.7	35.8	34.8	33.3	31.4	28.9	25.5
24	...	37.9	37.3	36.7	35.8	34.8	33.3	31.4	28.9	25.5
25	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
26	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
27	...	58.9	58.0	57.0	55.7	54.1	51.9	48.9	45.0	39.7
28	...	69.8	68.8	67.6	66.1	64.1	61.5	58.0	53.3	47.1
29	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
30	...	58.9	58.0	57.0	55.7	54.1	51.9	48.9	45.0	39.7
31	...	69.8	68.8	67.6	66.1	64.1	61.5	58.0	53.3	47.1
32	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
33	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
34	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
35	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
36	...	58.9	58.0	57.0	55.7	54.1	51.9	48.9	45.0	39.7
37	...	58.9	58.0	57.0	55.7	54.1	51.9	48.9	45.0	39.7
38	...	69.8	68.8	67.6	66.1	64.1	61.5	58.0	53.3	47.1
39	...	69.8	68.8	67.6	66.1	64.1	61.5	58.0	53.3	47.1
40	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
41	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
42	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
43	...	58.9	58.0	57.0	55.7	54.1	51.9	48.9	45.0	39.7
44	...	58.9	58.0	57.0	55.7	54.1	51.9	48.9	45.0	39.7
45	...	69.8	68.8	67.6	66.1	64.1	61.5	58.0	53.3	47.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	Mn- $\frac{1}{2}$ Ni-V	Plate	SA-225	C	K12524	...
2	Mn-V	Castings	SA-487	1	J13002	A
3	Mn-V	Castings	SA-487	1	J13002	B
4	$\frac{1}{2}$ Si- $\frac{1}{2}$ Mo	Smls. pipe	SA-335	P15	K11578	...
5	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	A
6	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	B
7	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Castings	SA-487	4	J13047	E
8	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	1
9	$\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V	Forgings	SA-541	3	K12045	2
10	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...
11	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Plate	SA-517	F	K11576	...
12	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-592	F	K11576	...
13	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Cu-Mo	Smls. & wld. tube	SA-423	2	K11540	...
14	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	1
15	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	1
16	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-508	2	K12766	2
17	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V	Forgings	SA-541	2	K12765	2
18	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042	1
19	$\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V	Forgings	SA-508	3	K12042	2
(23) 20	...	...	...	...	...	...
(23) 21	...	...	...	...	...	...
(23) 22	...	...	...	...	...	...
23	$\frac{3}{4}$ Ni-1Cu- $\frac{3}{4}$ Cr	Plate	SA-736	A	K12042	3
24	$\frac{3}{4}$ Ni-1Cu- $\frac{3}{4}$ Cr	Plate	SA-736	A	K12042	3
(23) 25	...	...	...	...	...	...
26	$\frac{3}{4}$ Ni-1Mo- $\frac{3}{4}$ Cr	Castings	SA-217	WC5	J22000	...
27	1Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Castings	SA-217	WC4	J12082	...
28	$\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650	...
29	$\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo	Plate	SA-517	P	K21650	...
30	$\frac{1}{2}$ Ni	Forgings	SA-350	LF5	K13050	1
31	$\frac{1}{2}$ Ni	Forgings	SA-350	LF5	K13050	2
32	$\frac{1}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-320	L43	G43400	...
33	$\frac{1}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Forgings	SA-372	L	K24055	...
34	$\frac{1}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	4340	G43400	...
35	$\frac{1}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-574	4340	G43400	...
36	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	5
37	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	5
38	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	4
39	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	3
40	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	2
41	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo	Bolting	SA-540	B23	H43400	1
42	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	5
43	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	5
44	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	4
45	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	105	70	...
2	...	85	55	...
3	...	90	65	...
4	...	60	30	...
5	...	90	60	...
6	...	105	85	...
7	...	115	95	...
8	...	80	50	...
9	...	90	65	...
10	$2\frac{1}{2} < t \leq 4$	105	90	...
11	$\leq 2\frac{1}{2}$	115	100	...
12	$\leq 2\frac{1}{2}$	115	100	...
13	...	60	37	...
14	...	80	50	...
15	...	80	50	...
16	...	90	65	...
17	...	90	65	...
18	...	80	50	...
19	...	90	65	...
20	...	...	...	...
21	...	...	...	...
22	...	...	...	...
23	$2 < t \leq 4$	75	65	...
24	≤ 2	85	75	...
25	...	...	...	...
26	...	70	40	...
27	...	70	40	...
28	$2\frac{1}{2} < t \leq 4$	105	90	...
29	$\leq 2\frac{1}{2}$	115	100	...
30	...	60	30	...
31	...	70	37.5	...
32	≤ 4	125	105	...
33	...	155	135	...
34	$\geq \frac{5}{8}$	170	135	...
35	$\leq \frac{1}{2}$	180	140	...
36	$6 < t \leq 9\frac{1}{2}$	115	100	...
37	≤ 6	120	105	...
38	$\leq 9\frac{1}{2}$	135	120	...
39	$\leq 9\frac{1}{2}$	145	130	...
40	$\leq 9\frac{1}{2}$	155	140	...
41	≤ 8	165	150	...
42	$6 < t \leq 9\frac{1}{2}$	115	100	...
43	≤ 6	120	105	...
44	$\leq 9\frac{1}{2}$	135	120	...
45	$\leq 9\frac{1}{2}$	145	130	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	70.0	64.9	63.7	63.1	62.4	...	59.8	...	56.0
2	55.0	...	...	...	...	...	...	...	...
3	65.0	...	...	...	...	...	...	...	...
4	30.0	28.8	28.2	27.7	27.3	...	26.5	...	25.9
5	60.0	58.7	57.0	55.5	54.4	...	53.3	...	51.9
6	85.0	83.1	80.7	78.6	77.1	...	75.5	...	73.6
7	95.0	92.9	90.2	87.9	86.2	...	84.4	...	82.2
8	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
9	65.0	63.0	61.9	60.9	60.2	...	58.9	...	58.0
10	90.0	87.5	86.0	84.5	83.2	...	80.9	...	78.9
11	100.0	97.2	95.5	93.9	92.4	...	89.9	...	87.6
12	100.0	97.2	95.5	93.9	92.4	...	89.9	...	87.6
13	37.0	...	...	...	...	...	...	...	...
14	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
15	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
16	65.0	62.5	61.2	60.1	59.1	...	57.5	...	56.1
17	65.0	62.5	61.2	60.1	59.1	...	57.5	...	56.1
18	50.0	48.1	47.0	46.2	45.5	...	44.2	...	43.2
19	65.0	62.5	61.2	60.1	59.1	...	57.5	...	56.1
20	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...
23	65.0	...	61.1	...	58.6	...	56.8	...	54.9
24	75.0	...	70.6	...	67.6	...	65.6	...	63.4
25	...	...	...	...	...	...	...	...	...
26	40.0	38.4	37.6	37.0	36.4	...	35.4	...	34.5
27	40.0	38.4	37.6	37.0	36.4	...	35.4	...	34.5
28	90.0	87.5	86.0	84.5	83.2	...	80.9	...	78.9
29	100.0	97.2	95.5	93.9	92.4	...	89.9	...	87.6
30	30.0	...	...	...	...	...	...	...	...
31	37.5	...	...	...	...	...	...	...	...
32	105.0	...	99.0	...	95.7	...	91.8	...	88.5
33	135.0	132.1	129.7	127.7	126.2	125.0	124.0	123.2	122.4
34	135.0	...	129.6	...	126.3	...	124.1	...	122.4
35	140.0	...	134.4	...	131.0	...	128.7	...	126.9
36	100.0	...	96.0	...	93.5	...	91.9	...	90.6
37	105.0	...	100.8	...	98.2	...	96.5	...	95.2
38	120.0	...	115.2	...	112.2	...	110.3	...	108.8
39	130.0	...	124.8	...	121.6	...	119.5	...	117.8
40	140.0	...	134.4	...	131.0	...	128.7	...	126.9
41	150.0	...	144.0	...	140.3	...	137.9	...	136.0
42	100.0	...	96.0	...	93.5	...	91.9	...	90.6
43	105.0	...	100.8	...	98.2	...	96.5	...	95.2
44	120.0	...	115.2	...	112.2	...	110.3	...	108.8
45	130.0	...	124.8	...	121.6	...	119.5	...	117.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	52.4	51.0	49.9	48.7	46.7	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	25.2	24.9	24.4	23.9	23.2	22.2	21.0	19.3	17.0
5	...	48.6	46.5	44.8	...	...	...	...	...	...
6	...	68.9	65.8	63.4	...	...	...	...	...	...
7	...	77.0	73.6	70.9	...	...	...	...	...	...
8	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
9	...	57.1	56.6	56.0	55.3	54.4	53.4	52.1	50.5	48.6
10	...	76.9	75.9	74.7	73.3	71.5	69.4	66.8	63.5	59.5
11	...	85.5	84.3	83.0	81.4	79.5	77.1	74.2	70.5	66.1
12	...	85.5	84.3	83.0	81.4	79.5	77.1	74.2	70.5	66.1
13	...	...	...	...	...	...	...	...	...	...
14	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
15	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
16	...	54.7	53.9	52.9	51.8	50.2	48.2	45.4	41.7	36.9
17	...	54.7	53.9	52.9	51.8	50.2	48.2	45.4	41.7	36.9
18	...	42.1	41.5	40.7	39.8	38.6	37.0	34.9	32.1	28.4
19	...	54.7	53.9	52.9	51.8	50.2	48.2	45.4	41.7	36.9
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	53.2	52.1	...	...	...	...	...	...	...
24	...	61.4	60.2	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	33.7	33.2	32.6	31.8	30.9	29.6	27.9	25.7	22.7
27	...	33.7	33.2	32.6	31.8	30.9	29.6	27.9	25.7	22.7
28	...	76.9	75.9	74.7	73.3	71.5	69.4	66.8	63.5	59.5
29	...	85.5	84.3	83.0	81.4	79.5	77.1	74.2	70.5	66.1
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	84.3	82.1	79.2	...	...	...	...	...	...
33	121.4	120.0	118.3	116.1	113.3	110.1	106.4	102.5	98.7	95.2
34	...	120.0	118.3	116.1	113.4	110.1	106.4	102.5	98.6	95.2
35	...	124.5	122.7	120.4	117.6	114.2	110.4	106.3	102.3	98.7
36	...	88.9	87.6	86.0	84.0	81.6	78.8	75.9	73.1	70.5
37	...	93.4	92.0	90.3	88.2	85.6	82.8	79.7	76.7	74.0
38	...	106.7	105.2	103.2	100.8	97.9	94.6	91.1	87.7	84.6
39	...	115.6	113.9	111.8	109.2	106.0	102.5	98.7	95.0	91.6
40	...	124.5	122.7	120.4	117.6	114.2	110.4	106.3	102.3	98.7
41	...	133.4	131.4	129.0	126.0	122.3	118.3	113.9	109.6	105.7
42	...	88.9	87.6	86.0	84.0	81.6	78.8	75.9	73.1	70.5
43	...	93.4	92.0	90.3	88.2	85.6	82.8	79.7	76.7	74.0
44	...	106.7	105.2	103.2	100.8	97.9	94.6	91.1	87.7	84.6
45	...	115.6	113.9	111.8	109.2	106.0	102.5	98.7	95.0	91.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	(23)
21	...	...	...	...	...	...	...	...	...	...	...	...	(23)
22	...	...	...	...	...	...	...	...	...	...	...	...	(23)
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	(23)
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	2
2	2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo	Bolting	SA-540	B24	K24064	1
3	2Ni-1Cu	Forgings	SA-182	FR	K22035	...
4	2Ni-1Cu	Fittings	SA-234	WPR	K22035	...
5	2Ni-1Cu	Smls. & wld. pipe	SA-333	9	K22035	...
6	2Ni-1Cu	Tube	SA-334	9	K22035	...
7	2Ni-1Cu	Forgings	SA-350	LF9	K22036	...
8	2Ni-1Cu	Smls. & wld. fittings	SA-420	WPL9	K22035	...
9	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	1
10	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	2
11	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	2a
12	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	3
13	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	4
14	2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V	Forgings	SA-723	1	K23550	5
15	2 $\frac{1}{2}$ Ni	Pipe	SA-333	7	K21903	...
16	2 $\frac{1}{2}$ Ni	Tube	SA-334	7	K21903	...
17	2 $\frac{1}{2}$ Ni	Plate	SA-203	A	K21703	...
18	2 $\frac{1}{2}$ Ni	Plate	SA-203	B	K22103	...
19	2 $\frac{1}{2}$ Ni	Castings	SA-352	LC2	J22500	...
20	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	...	3
21	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	...	1
22	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	C	...	2
23	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	1
24	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	2
25	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	2a
26	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	3
27	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	4
28	2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-723	2	K34035	5
29	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	3
30	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	M	K42365	85
31	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	1
32	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-508	5	K42365	2
33	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Plate	SA-543	B	K42339	2
34	3Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo	Forgings	SA-372	M	K42365	100
35	3 $\frac{1}{2}$ Ni	Pipe	SA-333	3	K31918	...
36	3 $\frac{1}{2}$ Ni	Tube	SA-334	3	K31918	...
37	3 $\frac{1}{2}$ Ni	Fittings	SA-420	WPL3	...	...
38	3 $\frac{1}{2}$ Ni	Plate	SA-203	D	K31718	...
39	3 $\frac{1}{2}$ Ni	Forgings	SA-350	LF3	K32025	...
40	3 $\frac{1}{2}$ Ni	Forgings	SA-765	III	K32026	...
41	3 $\frac{1}{2}$ Ni	Plate	SA-203	E	K32018	...
42	3 $\frac{1}{2}$ Ni	Castings	SA-352	LC3	J31550	...
43	3 $\frac{1}{2}$ Ni	Plate	SA-203	F	...	...
44	3 $\frac{1}{2}$ Ni	Plate	SA-203	F	...	...
45	3 $\frac{1}{2}$ Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-V	Forgings	SA-508	4N	K22375	3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	$\leq 9^{1/2}$	155	140	...
2	≤ 8	165	150	...
3	...	63	46	...
4	...	63	46	...
5	...	63	46	...
6	...	63	46	...
7	...	63	46	...
8	...	63	46	...
9	...	115	100	...
10	...	135	120	...
11	...	145	130	...
12	...	155	140	...
13	...	175	160	...
14	...	190	180	...
15	...	65	35	...
16	...	65	35	...
17	...	65	37	...
18	...	70	40	...
19	...	70	40	...
20	...	90	70	...
21	...	105	85	...
22	...	115	100	...
23	...	115	100	...
24	...	135	120	...
25	...	145	130	...
26	...	155	140	...
27	...	175	160	...
28	...	190	180	...
29	...	90	70	...
30	...	105	85	...
31	...	105	85	...
32	...	115	100	...
33	...	115	100	...
34	...	120	100	...
35	...	65	35	...
36	...	65	35	...
37	...	65	35	...
38	...	65	37	...
39	...	70	37.5	...
40	...	70	37.5	...
41	...	70	40	...
42	...	70	40	...
43	> 2	75	50	...
44	≤ 2	80	55	...
45	...	90	70	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	140.0	...	134.4	...	131.0	...	128.7	...	126.9
2	150.0	...	144.0	...	140.3	...	137.9	...	136.0
3	46.0	...	...	...	...	...	...	...	...
4	46.0	...	...	...	...	...	...	...	...
5	46.0	...	...	...	...	...	...	...	...
6	46.0	...	...	...	...	...	...	...	...
7	46.0	...	...	...	...	...	...	...	...
8	46.0	...	...	...	...	...	...	...	...
9	100.0	97.5	96.0	94.6	93.5	...	91.9	...	90.6
10	120.0	117.0	115.2	113.6	112.2	...	110.3	...	108.8
11	130.0	...	125.0	...	122.0	...	120.0	...	118.0
12	140.0	136.5	134.4	132.5	131.0	...	128.7	...	126.9
13	160.0	156.0	153.6	151.4	149.7	...	147.1	...	145.0
14	180.0	175.5	172.8	170.4	168.4	...	165.5	...	163.2
15	35.0	32.9	32.1	31.4	30.9	...	29.9	...	28.4
16	35.0	32.9	32.1	31.4	30.9	...	29.9	...	28.4
17	37.0	34.8	33.9	33.2	32.7	...	31.6	...	30.0
18	40.0	37.6	36.6	35.9	35.4	...	34.2	...	32.5
19	40.0	37.6	36.6	35.9	35.4	...	34.2	...	32.5
20	70.0	67.3	65.9	64.8	63.9	...	62.5	...	61.4
21	85.0	81.8	80.1	78.7	77.5	...	75.8	...	74.5
22	100.0	96.2	94.2	92.5	91.2	...	89.2	...	87.7
23	100.0	97.5	96.0	94.6	93.5	...	91.9	...	90.6
24	120.0	117.0	115.2	113.6	112.2	...	110.3	...	108.8
25	130.0	...	125.0	...	122.0	...	120.0	...	118.0
26	140.0	136.5	134.4	132.5	131.0	...	128.7	...	126.9
27	160.0	156.0	153.6	151.4	149.7	...	147.1	...	145.0
28	180.0	175.5	172.8	170.4	168.4	...	165.5	...	163.2
29	70.0	67.3	65.9	64.8	63.9	...	62.5	...	61.4
30	85.0	81.8	80.1	78.7	77.5	76.6	75.8	75.2	74.5
31	85.0	81.8	80.1	78.7	77.5	...	75.8	...	74.5
32	100.0	96.2	94.2	92.6	91.2	90.1	89.2	88.5	87.6
33	100.0	96.2	94.2	92.5	91.2	...	89.2	...	87.7
34	100.0	96.2	94.2	92.5	91.2	90.1	89.2	88.4	87.7
35	35.0	32.9	32.1	31.4	30.9	...	29.9	...	28.4
36	35.0	32.9	32.1	31.4	30.9	...	29.9	...	28.4
37	35.0	32.9	32.1	31.4	30.9	...	29.9	...	28.4
38	37.0	34.8	33.9	33.2	32.7	...	31.6	...	30.0
39	37.5	35.3	34.3	33.7	33.2	...	32.0	...	30.4
40	37.5	35.3	34.3	33.7	33.2	...	32.0	...	30.4
41	40.0	37.6	36.6	35.9	35.4	...	34.2	...	32.5
42	40.0	37.6	36.6	35.9	35.4	...	34.2	...	32.5
43	50.0	47.0	45.8	44.9	44.2	...	42.7	...	40.6
44	55.0	51.7	50.4	49.4	48.6	...	47.0	...	44.6
45	70.0	67.3	65.9	64.8	63.9	...	62.5	...	61.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	124.5	122.7	120.4	117.6	114.2	110.4	106.3	102.3	98.7
2	...	133.4	131.4	129.0	126.0	122.3	118.3	113.9	109.6	105.7
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	88.9	87.6	86.0	84.0	81.6	80.9	79.4	77.8	...
10	...	106.7	105.2	103.2	100.8	97.9	97.1	95.2	93.4	...
11	...	116.0	114.0	112.0	109.0	106.0	...	...	...	...
12	...	124.5	122.7	120.4	117.6	114.2	113.3	111.1	108.9	...
13	...	142.2	140.2	137.6	134.3	130.5	129.5	127.0	124.5	...
14	...	160.0	157.7	154.8	151.1	146.8	145.6	142.8	140.0	...
15	...	26.3	25.0	23.6	22.1	20.5	19.0	17.5	16.0	14.6
16	...	26.3	25.0	23.6	22.1	20.5	19.0	17.5	16.0	14.6
17	...	27.8	26.4	24.9	23.4	21.7	20.1	18.4	16.9	15.4
18	...	30.0	28.6	27.0	25.3	23.5	21.7	19.9	18.3	16.7
19	...	30.0	28.6	27.0	25.3	23.5	21.7	19.9	18.3	16.7
20	...	60.2	59.5	58.7	57.6	56.2	54.6	52.6	50.2	47.3
21	...	73.1	72.3	71.2	69.9	68.3	66.3	63.9	60.9	57.5
22	...	86.0	85.0	83.8	82.2	80.3	78.0	75.1	71.7	67.6
23	...	88.9	87.6	86.0	84.0	81.6	80.9	79.4	77.8	...
24	...	106.7	105.2	103.2	100.8	97.9	97.1	95.2	93.4	...
25	...	116.0	114.0	112.0	109.0	106.0	...	...	...	...
26	...	124.5	122.7	120.4	117.6	114.2	113.3	111.1	108.9	...
27	...	142.2	140.2	137.6	134.3	130.5	129.5	127.0	124.5	...
28	...	160.0	157.7	154.8	151.1	146.8	145.6	142.8	140.0	...
29	...	60.2	59.5	58.7	57.6	56.2	54.6	52.6	50.2	47.3
30	73.9	73.1	72.3	71.2	69.9	68.3	66.3	63.9	60.9	57.5
31	...	73.1	72.3	71.2	69.9	68.3	66.3	63.9	60.9	57.5
32	86.9	86.0	85.0	83.8	82.2	80.4	78.0	75.2	71.6	67.6
33	...	86.0	85.0	83.8	82.2	80.3	78.0	75.1	71.7	67.6
34	86.9	86.0	85.0	83.8	82.2	80.3	78.0	75.1	71.7	67.6
35	...	26.3	25.0	23.6	22.1	20.5	19.0	17.5	16.0	14.6
36	...	26.3	25.0	23.6	22.1	20.5	19.0	17.5	16.0	14.6
37	...	26.3	25.0	23.6	22.1	20.5	19.0	17.5	16.0	14.6
38	...	27.8	26.4	24.9	23.4	21.7	20.1	18.4	16.9	15.4
39	...	28.2	26.8	25.3	23.7	22.0	20.3	18.7	17.1	15.6
40	...	28.2	26.8	25.3	23.7	22.0	20.3	18.7	17.1	15.6
41	...	30.0	28.6	27.0	25.3	23.5	21.7	19.9	18.3	16.7
42	...	30.0	28.6	27.0	25.3	23.5	21.7	19.9	18.3	16.7
43	...	37.5	35.7	33.7	31.6	29.4	27.1	24.9	22.8	20.8
44	...	41.3	39.3	37.1	34.7	32.3	29.8	27.4	25.1	22.9
45	...	60.2	59.5	58.7	57.6	56.2	54.6	52.6	50.2	47.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-541	4N	K42343	3
2	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-508	4N	K22375	1
3	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-541	5	K42348	1
4	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-508	4N	K22375	2
5	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-541	4N	K42343	2
6	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-541	5	K42348	2
7	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	3	K44045	1
8	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	3	K44045	2
9	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	3	K44045	2a
10	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	3	K44045	3
11	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	3	K44045	4
12	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	Forgings	SA-723	3	K44045	5
13	$5\text{Ni}-\frac{1}{4}\text{Mo}$	Plate	SA-645	A	K41583	...
14	7Ni	Plate	SA-553	III	K61365	...
15	8Ni	Forgings	SA-522	II	K71340	...
16	8Ni	Plate	SA-553	II	K71340	...
17	9Ni	Plate	SA/EN 10028-4	X8Ni9	...	NNT640
18	9Ni	Plate	SA/EN 10028-4	X8Ni9	...	QT640
19	9Ni	Plate	SA/EN 10028-4	X7Ni9	...	QT
20	9Ni	Plate	SA/EN 10028-4	X8Ni9	...	QT680
21	9Ni	Smls. & wld. pipe	SA-333	8	K81340	...
22	9Ni	Smls. & wld. tube	SA-333	8	K81340	...
23	9Ni	Plate	SA-353	...	K81340	...
24	9Ni	Smls. & wld. fittings	SA-420	WPL8	K81340	...
25	9Ni	Forgings	SA-522	I	K81340	...
26	9Ni	Plate	SA-553	I	K81340	...
27	25Ni-15Cr-2Ti	Bolting	SA-453	660	S66286	A
28	25Ni-15Cr-2Ti	Bolting	SA-453	660	S66286	B
29	25Ni-15Cr-2Ti	Forgings, bar	SA-638	660	S66286	1
30	25Ni-15Cr-2Ti	Forgings, bar	SA-638	660	S66286	2
31	27Ni-22Cr-7Mo-Mn-Cu-N	Forgings	SA-182	...	S31277	...
32	27Ni-22Cr-7Mo-Mn-Cu-N	Smls. tube	SA-213	...	S31277	...
33	27Ni-22Cr-7Mo-Mn-Cu-N	Plate	SA-240	...	S31277	...
34	27Ni-22Cr-7Mo-Mn-Cu-N	Wld. tube	SA-249	...	S31277	...
35	29Ni-20Cr-3Cu-2Mo	Castings	SA-351	CN7M	J95150	...
36	14Cr-16Ni-6Si-Cu-Mo	Smls. tube	SA-213	...	S38815	...
37	14Cr-16Ni-6Si-Cu-Mo	Plate	SA-240	...	S38815	...
38	14Cr-16Ni-6Si-Cu-Mo	Wld. tube	SA-249	...	S38815	...
39	14Cr-16Ni-6Si-Cu-Mo	Wld. pipe	SA-312	...	S38815	...
40	14Cr-16Ni-6Si-Cu-Mo	Smls. & wld. fittings	SA-403	...	S38815	...
41	14Cr-16Ni-6Si-Cu-Mo	Bar	SA-479	...	S38815	...
42	16Cr-4Ni-6Mn	Plate	SA-240	201LN	S20153	...
43	16Cr-9Mn-2Ni-N	Plate	SA-240	204	S20400	...
44	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...
45	16Cr-12Ni-2Mo	Forgings	SA-965	F316L	S31603	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	90	70	...
2	...	105	85	...
3	...	105	85	...
4	...	115	100	...
5	...	115	100	...
6	...	115	100	...
7	...	115	100	...
8	...	135	120	...
9	...	145	130	...
10	...	155	140	...
11	...	175	160	...
12	...	190	180	...
13	...	95	65	...
14	≤2	100	85	...
15	...	100	75	...
16	...	100	85	...
17	≤2	93	69.5	...
18	≤2	93	69.5	...
19	≤2	98.5	83.5	...
20	≤2	98.5	83.5	...
21	...	100	75	...
22	...	100	75	...
23	...	100	75	...
24	...	100	75	...
25	...	100	75	...
26	...	100	85	...
27	...	130	85	...
28	...	130	85	...
29	...	130	85	...
30	...	130	85	...
31	...	112	52	...
32	...	112	52	...
33	...	112	52	...
34	...	112	52	...
35	...	62	25	...
36	...	78	37	...
37	...	78	37	...
38	...	78	37	...
39	...	78	37	...
40	...	78	37	...
41	...	78	37	...
42	...	95	45	...
43	...	95	48	...
44	>5	65	25	...
45	...	65	25	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	70.0	...	65.9	...	63.9	...	62.5	...	61.4
2	85.0	81.8	80.1	78.7	77.5	...	75.8	...	74.5
3	85.0	...	80.1	...	77.5	...	75.8	...	74.5
4	100.0	96.2	94.2	92.5	91.2	...	89.2	...	87.7
5	100.0	...	94.2	...	91.2	...	89.2	...	87.7
6	100.0	...	94.2	...	91.2	...	89.2	...	87.7
7	100.0	97.5	96.0	94.6	93.5	...	91.9	...	90.6
8	120.0	117.0	115.2	113.6	112.2	...	110.3	...	108.8
9	130.0	...	125.0	...	122.0	...	120.0	...	118.0
10	140.0	136.5	134.4	132.5	131.0	...	128.7	...	126.9
11	160.0	156.0	153.6	151.4	149.7	...	147.4	...	145.0
12	180.0	175.5	172.8	170.4	168.4	...	165.5	...	163.2
13	65.0	...	...	...	...	...	...	...	...
14	85.0	80.9	...	...	...	...	...	...	...
15	75.0	72.8	72.0	70.5	67.0	...	...	...	...
16	85.0	82.5	81.6	79.9	75.9	...	...	...	...
17	69.6	67.6	66.9	65.4	62.1	...	...	...	...
18	69.6	67.6	66.9	65.4	62.1	...	...	...	...
19	83.4	81.0	80.1	78.4	74.4	...	...	...	...
20	83.4	81.0	80.1	78.4	74.4	...	...	...	...
21	75.0	72.8	72.0	70.5	67.0	...	...	...	...
22	75.0	72.8	72.0	70.5	67.0	...	...	...	...
23	75.0	72.8	72.0	70.5	67.0	...	...	...	...
24	75.0	72.8	72.0	70.5	67.0	...	...	...	...
25	75.0	72.8	72.0	70.5	67.0	...	...	...	...
26	85.0	82.5	81.6	79.9	75.9	...	...	...	...
27	85.0	...	83.3	...	82.0	...	80.8	...	79.3
28	85.0	...	83.3	...	82.0	...	80.8	...	79.3
29	85.0	...	83.3	...	82.0	...	80.7	...	79.4
30	85.0	...	83.3	...	82.0	...	80.7	...	79.4
31	52.0	50.5	48.2	45.6	43.2	41.2	39.7	38.8	38.3
32	52.0	50.5	48.2	45.6	43.2	41.2	39.7	38.8	38.3
33	52.0	50.5	48.2	45.6	43.2	41.2	39.7	38.8	38.3
34	52.0	50.5	48.2	45.6	43.2	41.2	39.7	38.8	38.3
35	25.0	...	21.6	...	19.4	...	17.6	...	16.2
36	37.0	...	31.2	...	27.8	...	25.6	...	24.4
37	37.0	...	31.2	...	27.8	...	25.6	...	24.4
38	37.0	...	31.2	...	27.8	...	25.6	...	24.4
39	37.0	...	31.2	...	27.8	...	25.6	...	24.4
40	37.0	...	31.2	...	27.8	...	25.6	...	24.4
41	37.0	...	31.2	...	27.8	...	25.6	...	24.4
42	45.0	...	36.3	...	32.9	...	31.1	...	30.0
43	48.0	40.3	36.4	33.1	30.5	...	26.8	...	24.8
44	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
45	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	60.2	59.5	58.7	...	...	...	...	...	...
2	...	73.1	72.3	71.2	69.9	68.3	66.3	63.9	60.9	57.5
3	...	73.1	72.3	71.2	...	...	...	...	...	...
4	...	86.0	85.0	83.8	82.2	80.3	78.0	75.1	71.7	67.6
5	...	86.0	85.0	83.9	...	...	...	...	...	...
6	...	86.0	85.0	83.9	...	...	...	...	...	...
7	...	88.9	87.6	86.0	84.0	81.6	80.9	79.4	77.8	...
8	...	106.7	105.2	103.2	100.8	97.9	97.1	95.2	93.4	...
9	...	116.0	114.0	112.0	109.0	106.0	...	...	...	...
10	...	124.5	122.7	120.4	117.6	114.2	113.3	111.1	108.9	...
11	...	142.2	140.2	137.6	134.3	130.5	129.5	127.0	124.5	...
12	...	160.0	157.7	154.8	151.1	146.8	145.6	142.8	140.0	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	77.9	77.2	76.4	75.7	74.9	74.0	73.2	72.3	71.5
28	...	77.9	77.2	76.4	75.7	74.9	74.0	73.2	72.3	71.5
29	...	77.9	77.2	76.4	75.7	74.9	74.0	73.2	...	...
30	...	77.9	77.2	76.4	75.7	74.9	74.0	73.2	...	...
31	38.1	38.1	38.0	37.9	37.7	37.4	...	...	...	...
32	38.1	38.1	38.0	37.9	37.7	37.4	...	...	...	...
33	38.1	38.1	38.0	37.9	37.7	37.4	...	...	...	...
34	38.1	38.1	38.0	37.9	37.7	37.4	...	...	...	...
35	...	15.0	14.5	14.0	...	...	...	...	...	...
36	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
37	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
38	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
39	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
40	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
41	...	24.0	24.0	24.0	24.0	24.0	...	...	...	...
42	...	28.7	27.9	27.0	26.0	25.1	24.2	23.6	23.6	23.6
43	...	23.8	23.5	23.2	23.0	22.7	22.2	21.5	20.5	19.1
44	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
45	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
45	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	16Cr-12Ni-2Mo	Forgings	SA-182	F316L	S31603	...
2	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316L	S31603	...
3	16Cr-12Ni-2Mo	Plate	SA-240	316L	S31603	...
4	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316L	S31603	...
5	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316L	S31603	...
6	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	1
7	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	3
8	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316L	S31603	4
9	16Cr-12Ni-2Mo	Smls. & wld. fittings	SA-403	316L	S31603	...
10	16Cr-12Ni-2Mo	Wld. pipe	SA-409	TP316L	S31603	...
11	16Cr-12Ni-2Mo	Bar	SA-479	316L	S31603	Annealed
12	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316L	S31603	...
13	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316L	S31603	...
14	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316L	S31603	...
15	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316L	...	...
16	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...
17	16Cr-12Ni-2Mo	Forgings	SA-965	F316	S31600	...
18	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...
19	16Cr-12Ni-2Mo	Forgings	SA-965	F316H	S31609	...
20	16Cr-12Ni-2Mo	Forgings	SA-182	F316	S31600	...
21	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	1
22	16Cr-12Ni-2Mo	Bolting	SA-193	B8MA	S31600	1A
23	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316	S31600	...
24	16Cr-12Ni-2Mo	Plate	SA-240	316	S31600	...
25	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316	S31600	...
26	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316	S31600	...
27	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	1
28	16Cr-12Ni-2Mo	Bolting	SA-320	B8MA	S31600	1A
29	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	1
30	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	3
31	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316	S31600	4
32	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316	S31600	...
33	16Cr-12Ni-2Mo	Smls. & wld. fittings	SA-403	316	S31600	...
34	16Cr-12Ni-2Mo	Wld. pipe	SA-409	TP316	S31600	...
35	16Cr-12Ni-2Mo	Bar	SA-479	316	S31600	Annealed
36	16Cr-12Ni-2Mo	Wld. tube	SA-688	TP316	S31600	...
37	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316	S31600	...
38	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316	S31600	...
39	16Cr-12Ni-2Mo	Bar	SA/JIS G4303	SUS316	...	...
40	16Cr-12Ni-2Mo	Forgings	SA-182	F316H	S31609	...
41	16Cr-12Ni-2Mo	Smls. tube	SA-213	TP316H	S31609	...
42	16Cr-12Ni-2Mo	Plate	SA-240	316H	S31609	...
43	16Cr-12Ni-2Mo	Wld. tube	SA-249	TP316H	S31609	...
44	16Cr-12Ni-2Mo	Smls. & wld. pipe	SA-312	TP316H	S31609	...
45	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	≤5	70	25	...
2	...	70	25	...
3	...	70	25	...
4	...	70	25	...
5	...	70	25	...
6	...	70	25	...
7	...	70	25	...
8	...	70	25	...
9	...	70	25	...
10	...	70	25	...
11	...	70	25	...
12	...	70	25	...
13	...	70	25	...
14	...	70	25	...
15	...	70	25	...
16	>5	70	30	...
17	...	70	30	...
18	>5	70	30	...
19	...	70	30	...
20	≤5	75	30	...
21	...	75	30	...
22	...	75	30	...
23	...	75	30	...
24	...	75	30	...
25	...	75	30	...
26	...	75	30	...
27	...	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	75	30	...
32	...	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	≤5	75	30	...
41	...	75	30	...
42	...	75	30	...
43	...	75	30	...
44	...	75	30	...
45	...	75	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
2	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
3	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
4	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
5	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
6	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
7	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
8	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
9	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
10	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
11	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
12	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
13	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
14	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
15	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
16	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
17	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
18	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
19	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
20	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
21	30.0	...	25.9	...	23.4	...	21.4	...	20.0
22	30.0	...	25.9	...	23.4	...	21.4	...	20.0
23	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
24	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
25	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
26	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
27	30.0	...	25.9	...	23.4	...	21.4	...	20.0
28	30.0	...	25.9	...	23.4	...	21.4	...	20.0
29	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
30	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
31	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
32	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
33	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
34	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
35	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
36	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
37	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
38	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
39	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
40	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
41	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
42	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
43	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
44	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
45	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
2	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
3	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
4	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
5	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
6	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
7	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
8	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
9	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
10	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
11	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
12	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
13	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
14	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
15	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
16	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
17	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
18	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
19	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
20	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
21	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
22	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
23	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
24	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
25	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
26	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
27	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
28	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
29	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
30	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
31	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
32	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
33	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
34	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
35	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
36	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
37	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
38	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
39	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
40	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
41	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
42	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
43	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
44	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
45	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
2	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
3	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
4	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
5	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
6	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
7	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
8	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
9	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
10	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
11	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
12	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
13	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
14	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
17	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
21	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
22	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
23	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
24	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
25	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
26	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
27	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
28	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
29	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
30	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
31	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
32	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
33	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
34	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
35	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
36	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
37	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
38	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	3
2	16Cr-12Ni-2Mo	Wld. pipe	SA-358	316H	S31609	4
3	16Cr-12Ni-2Mo	Smls. pipe	SA-376	TP316H	S31609	...
4	16Cr-12Ni-2Mo	Smls. & wld. fittings	SA-403	316H	S31609	...
5	16Cr-12Ni-2Mo	Bar	SA-479	316H	S31609	...
6	16Cr-12Ni-2Mo	Wld. pipe	SA-813	TP316H	S31609	...
7	16Cr-12Ni-2Mo	Wld. pipe	SA-814	TP316H	S31609	...
8	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X2CrNiMo17-12-2	...	...
9	16Cr-12Ni-2Mo	Plate	SA/EN 10028-7	X5CrNiMo17-12-2	...	...
(23) 10	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B
11	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	S
12	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2
13	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2
(23) 14	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B
15	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	S
16	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B
17	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2
18	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2
(23) 19	16Cr-12Ni-2Mo	Bolting	SA-193	B8M2	S31600	2B
20	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	S
21	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B
22	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2
23	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2
24	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B
25	16Cr-12Ni-2Mo	Bolting	SA-193	B8M	S31600	2
26	16Cr-12Ni-2Mo	Bolting	SA-320	B8M	S31600	2
27	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B
28	16Cr-12Ni-2Mo	Bar	SA-276	316	S31600	B
29	16Cr-12Ni-2Mo-Cb	Plate	SA-240	316Cb	S31640	...
30	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...
31	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316LN	S31653	...
32	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316LN	S31653	...
33	16Cr-12Ni-2Mo-N	Bolting	SA-193	B8MNA	S31651	1A
34	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316LN	S31653	...
35	16Cr-12Ni-2Mo-N	Plate	SA-240	316LN	S31653	...
36	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316LN	S31653	...
37	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316LN	S31653	...
38	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	1
39	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	3
40	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316LN	S31653	4
41	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316LN	S31653	...
42	16Cr-12Ni-2Mo-N	Fittings	SA-403	316LN	S31653	...
43	16Cr-12Ni-2Mo-N	Bar	SA-479	316LN	S31653	...
44	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316LN	S31653	...
45	16Cr-12Ni-2Mo-N	Forgings	SA-182	F316N	S31651	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	75	30	...
2	...	75	30	...
3	...	75	30	...
4	...	75	30	...
5	...	75	30	...
6	...	75	30	...
7	...	75	30	...
8	≤ 3	75	32	...
9	≤ 3	75	32	...
10	$2\frac{1}{2} < t \leq 3$	80	55	...
11	$2\frac{1}{2} < t \leq 3$	80	55	...
12	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	90	50	...
13	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	90	50	...
14	$2 < t \leq 2\frac{1}{2}$	90	65	...
15	$2 < t \leq 2\frac{1}{2}$	90	65	...
16	$1\frac{1}{2} < t \leq 1\frac{3}{4}$	95	45	...
17	$1 < t \leq 1\frac{1}{4}$	95	65	...
18	$1 < t \leq 1\frac{1}{4}$	95	65	...
19	≤ 2	95	75	...
20	≤ 2	95	75	...
21	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
22	$\frac{3}{4} < t \leq 1$	100	80	...
23	$\frac{3}{4} < t \leq 1$	100	80	...
24	$1 < t \leq 1\frac{1}{4}$	105	65	...
25	$\leq \frac{3}{4}$	110	95	...
26	$\leq \frac{3}{4}$	110	95	...
27	$\frac{3}{4} < t \leq 1$	115	80	...
28	$\leq \frac{3}{4}$	125	100	...
29	...	75	30	...
30	> 5	70	30	...
31	...	70	30	...
32	≤ 5	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	...	75	30	...
41	...	75	30	...
42	...	75	30	...
43	...	75	30	...
44	...	75	30	...
45	...	80	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
2	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
3	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
4	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
5	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
6	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
7	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
8	31.9	28.9	27.2	25.7	24.4	...	22.3	...	20.9
9	31.9	29.1	27.6	26.2	24.9	...	22.8	...	21.2
10	55.0	...	51.7	...	48.8	...	46.5	...	45.3
11	55.0	...	51.7	...	48.8	...	46.5	...	45.3
12	50.0	...	47.0	...	44.4	...	42.3	...	41.2
13	50.0	...	47.0	...	44.4	...	42.3	...	41.2
14	65.0	...	61.1	...	57.7	...	54.9	...	53.5
15	65.0	...	61.1	...	57.7	...	54.9	...	53.5
16	45.0	...	42.3	...	39.9	...	38.0	...	37.0
17	65.0	...	61.1	...	57.7	...	54.9	...	53.5
18	65.0	...	61.1	...	57.7	...	54.9	...	53.5
19	75.0	...	70.5	...	66.5	...	63.4	...	61.7
20	75.0	...	70.5	...	66.5	...	63.4	...	61.7
21	50.0	...	47.0	...	44.4	...	42.3	...	41.2
22	80.0	...	69.1	...	65.5	...	59.6	...	55.0
23	80.0	...	69.1	...	65.5	...	59.6	...	55.0
24	65.0	...	61.1	...	57.7	...	54.9	...	53.5
25	95.0	...	79.2	...	71.1	...	65.5	...	61.5
26	95.0	...	79.2	...	71.1	...	65.5	...	61.5
27	80.0	...	75.2	...	71.0	...	67.6	...	65.8
28	100.0	...	94.0	...	88.7	...	84.5	...	82.3
29	30.0	28.0	26.5	25.1	23.8	...	21.5	...	19.8
30	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
31	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
32	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
33	30.0	27.9	26.6	25.5	24.4	...	22.6	...	21.2
34	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
35	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
36	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
37	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
38	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
39	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
40	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
41	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
42	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
43	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
44	30.0	27.1	25.5	24.1	22.9	...	21.0	...	19.5
45	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
2	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
3	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
4	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
5	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
6	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
7	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
8	...	19.9	19.5	19.2	18.8	18.4	18.0	17.6	17.2	16.9
9	...	20.1	19.7	19.3	19.1	18.8	18.6	18.4	18.2	18.1
10	...	44.4	43.9	43.2	42.7	42.1	41.5	40.9	40.3	39.6
11	...	44.4	...	...	...	...	...	...	...	...
12	...	40.4	39.9	39.3	38.8	38.3	37.7	37.2	36.7	36.0
13	...	40.4	39.9	39.3	38.8	38.3	37.7	37.2	36.7	36.0
14	...	52.5	51.8	51.0	50.4	49.7	49.0	48.4	47.6	46.8
15	...	52.5	...	...	...	...	...	...	...	...
16	...	36.3	...	...	...	...	...	...	...	...
17	...	52.5	51.8	51.0	50.4	49.7	49.0	48.4	47.6	46.8
18	...	52.5	51.8	51.0	50.4	49.7	49.0	48.4	47.6	46.8
19	...	60.5	59.8	58.9	58.1	57.4	56.6	55.8	55.0	54.0
20	...	60.5	...	...	...	...	...	...	...	...
21	...	40.4	...	...	...	...	...	...	...	...
22	...	51.7	49.3	48.4	47.7	47.1	46.6	46.1	45.7	45.3
23	...	51.7	49.3	48.4	47.7	47.1	46.6	46.1	45.7	45.3
24	...	52.5	...	...	...	...	...	...	...	...
25	...	58.3	57.0	55.7	54.5	53.4	52.3	51.3	50.2	49.2
26	...	58.3	57.0	55.7	54.5	53.4	52.3	51.3	50.2	49.2
27	...	64.6	...	...	...	...	...	...	...	...
28	...	80.7	...	...	...	...	...	...	...	...
29	...	18.7	18.3	18.0	17.8	17.6	17.5	17.4	17.3	17.1
30	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
31	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
32	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
33	...	20.1	19.5	19.1	18.7	18.3	17.9	17.6	17.2	17.0
34	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
35	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
36	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
37	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
38	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
39	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
40	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
41	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
42	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
43	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
44	...	18.3	17.8	17.3	16.9	16.5	16.1	15.8	15.5	15.3
45	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	(23)
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	(23)
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	16Cr-12Ni-2Mo-N	Smls. tube	SA-213	TP316N	S31651	...
2	16Cr-12Ni-2Mo-N	Plate	SA-240	316N	S31651	...
3	16Cr-12Ni-2Mo-N	Wld. tube	SA-249	TP316N	S31651	...
4	16Cr-12Ni-2Mo-N	Smls. & wld. pipe	SA-312	TP316N	S31651	...
5	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	1
6	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	3
7	16Cr-12Ni-2Mo-N	Wld. pipe	SA-358	316N	S31651	4
8	16Cr-12Ni-2Mo-N	Smls. pipe	SA-376	TP316N	S31651	...
9	16Cr-12Ni-2Mo-N	Smls. & wld. fittings	SA-403	316N	S31651	...
10	16Cr-12Ni-2Mo-N	Bar	SA-479	316N	S31651	...
11	16Cr-12Ni-2Mo-N	Wld. tube	SA-688	TP316N	S31651	...
12	16Cr-12Ni-2Mo-N	Wld. pipe	SA-813	TP316N	S31651	...
13	16Cr-12Ni-2Mo-N	Wld. pipe	SA-814	TP316N	S31651	...
14	16Cr-12Ni-2Mo-N	Forgings	SA-965	F316N	S31651	...
15	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-11-2	...	...
16	16Cr-12Ni-2Mo-N	Plate	SA/EN 10028-7	X2CrNiMoN17-13-3	...	...
(23) 17	16Cr-12Ni-2Mo-Ti	Smls. tube	SA-214	TP316Ti	S31635	...
(23) 18	16Cr-12Ni-2Mo-Ti	Plate	SA-240	316Ti	S31635	...
(23) 19	16Cr-12Ni-2Mo-Ti	Smls. & wld. pipe	SA-312	TP316Ti	S31635	...
20	17Cr-4Ni-6Mn	Plate	SA-240	201-1	S20100	...
21	17Cr-4Ni-6Mn	Plate	SA-666	201-1	S20100	...
22	17Cr-4Ni-6Mn	Plate	SA-240	201-2	S20100	...
23	17Cr-4Ni-6Mn	Plate	SA-666	201-2	S20100	...
24	17Cr-7Ni	Plate, sheet, strip	SA-240	301	S30100	...
25	17.5Cr-17.5Ni-5.3Si	Plate	SA-240	...	S30601	Solution ann.
26	18Cr-3Ni-12Mn	Plate	SA-240	XM-29	S24000	...
27	18Cr-3Ni-12Mn	Wld. tube	SA-249	XM-29	S24000	...
28	18Cr-3Ni-12Mn	Wld. pipe	SA-312	XM-29	S24000	...
29	18Cr-3Ni-12Mn	Bar	SA-479	XM-29	S24000	...
30	18Cr-3Ni-12Mn	Wld. tube	SA-688	TPXM-29	S24000	...
31	18Cr-5Ni-3Mo	Smls. & wld. tube	SA-789	...	S31500	...
32	18Cr-5Ni-3Mo	Smls. & wld. pipe	SA-790	...	S31500	...
33	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...
34	18Cr-8Ni	Forgings	SA-965	F304L	S30403	...
35	18Cr-8Ni	Forgings	SA-182	F304L	S30403	...
36	18Cr-8Ni	Smls. tube	SA-213	TP304L	S30403	...
37	18Cr-8Ni	Plate	SA-240	304L	S30403	...
38	18Cr-8Ni	Wld. tube	SA-249	TP304L	S30403	...
39	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304L	S30403	...
40	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	1
41	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	3
42	18Cr-8Ni	Wld. pipe	SA-358	304L	S30403	4
43	18Cr-8Ni	Smls. & wld. fittings	SA-403	304L	S30403	...
44	18Cr-8Ni	Wld. pipe	SA-409	TP304L	S30403	...
45	18Cr-8Ni	Bar	SA-479	304L	S30403	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	80	35	...
2	...	80	35	...
3	...	80	35	...
4	...	80	35	...
5	...	80	35	...
6	...	80	35	...
7	...	80	35	...
8	...	80	35	...
9	...	80	35	...
10	...	80	35	...
11	...	80	35	...
12	...	80	35	...
13	...	80	35	...
14	...	80	35	...
15	≤3	84	41	...
16	≤3	84	41	...
17	...	70	30	...
18	...	75	30	...
19	...	70	30	...
20	...	75	38	...
21	...	75	38	...
22	...	95	45	...
23	...	95	45	...
24	...	75	30	...
25	...	78	37	...
26	...	100	55	...
27	...	100	55	...
28	...	100	55	...
29	...	100	55	...
30	...	100	55	...
31	...	92	64	...
32	...	92	64	...
33	>5	65	25	...
34	...	65	25	...
35	≤5	70	25	...
36	...	70	25	...
37	...	70	25	...
38	...	70	25	...
39	...	70	25	...
40	...	70	25	...
41	...	70	25	...
42	...	70	25	...
43	...	70	25	...
44	...	70	25	...
45	...	70	25	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
2	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
3	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
4	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
5	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
6	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
7	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
8	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
9	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
10	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
11	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
12	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
13	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
14	35.0	32.5	31.0	29.7	28.5	...	26.4	...	24.7
15	40.6	37.6	34.5	32.8	31.0	...	28.4	...	26.4
16	40.6	37.6	34.5	32.8	31.0	...	28.4	...	26.4
17	30.0	28.0	26.5	25.1	23.8	22.7	21.5	20.7	19.8
18	30.0	28.0	26.5	25.1	23.8	22.7	21.5	20.7	19.8
19	30.0	28.0	26.5	25.1	23.8	22.7	21.5	20.7	19.8
20	38.0	31.8	28.9	26.6	25.0	...	22.7	...	...
21	38.0	31.8	28.9	26.6	25.0	...	22.7	...	...
22	45.0	37.7	34.2	31.5	29.6	...	26.9	...	...
23	45.0	37.7	34.2	31.5	29.6	...	26.9	...	...
24	30.0	...	24.2	...	21.6	...	20.2	...	19.5
25	37.0	...	30.4	...	27.1	...	24.7	...	22.7
26	55.0	48.3	44.2	40.6	37.5	...	32.9	...	30.2
27	55.0	48.3	44.2	40.6	37.5	...	32.9	...	30.2
28	55.0	48.3	44.2	40.6	37.5	...	32.9	...	30.2
29	55.0	48.3	44.2	40.6	37.5	...	32.9	...	30.2
30	55.0	48.3	44.2	40.6	37.5	...	32.9	...	30.2
31	64.0	55.6	52.3	50.2	49.0	...	47.7	...	46.6
32	64.0	55.6	52.3	50.2	49.0	...	47.7	...	46.6
33	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
34	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
35	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
36	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
37	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
38	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
39	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
40	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
41	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
42	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
43	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
44	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
45	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
2	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
3	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
4	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
5	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
6	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
7	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
8	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
9	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
10	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
11	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
12	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
13	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
14	...	23.4	22.8	22.3	21.8	21.3	20.9	20.5	20.1	19.8
15	...	24.8	24.1	23.5	22.9	22.3	...	...	...	...
16	...	24.8	24.1	23.5	22.9	22.3	...	...	...	...
17	...	18.7	18.3	18.0	17.8	17.6	17.5	17.4	17.3	17.1
18	...	18.7	18.3	18.0	17.8	17.6	17.5	17.4	17.3	17.1
19	...	18.7	18.3	18.0	17.8	17.6	17.5	17.4	17.3	17.1
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	18.8	18.3	17.8	17.3	16.7	16.2	15.8	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	28.7	28.2	27.8	27.3	26.6	25.9	25.1	24.2	23.4
27	...	28.7	28.2	27.8	27.3	26.6	25.9	25.1	24.2	23.4
28	...	28.7	28.2	27.8	27.3	26.6	25.9	25.1	24.2	23.4
29	...	28.7	28.2	27.8	27.3	26.6	25.9	25.1	24.2	23.4
30	...	28.7	28.2	27.8	27.3	26.6	25.9	25.1	24.2	23.4
31	...	45.2	44.4	43.6	42.8	42.3	...	...	...	...
32	...	45.2	44.4	43.6	42.8	42.3	...	...	...	...
33	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
34	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
35	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
36	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
37	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
38	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
39	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
40	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
41	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
42	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
43	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
44	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
45	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
18	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
19	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
34	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
35	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
36	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
37	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
38	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
39	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
40	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
41	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
42	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
43	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
44	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
45	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	18Cr-8Ni	Wld. tube	SA-688	TP304L	S30403	...
2	18Cr-8Ni	Wld. pipe	SA-813	TP304L	S30403	...
3	18Cr-8Ni	Wld. pipe	SA-814	TP304L	S30403	...
4	18Cr-8Ni	Bar	SA/JIS G4303	SUS304L	...	...
5	18Cr-8Ni	Forgings	SA-182	F304	S30400	...
6	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...
7	18Cr-8Ni	Castings	SA-351	CF3	J92500	...
8	18Cr-8Ni	Castings	SA-351	CF8	J92600	...
9	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...
10	18Cr-8Ni	Cast pipe	SA-451	CPF3	J92500	...
11	18Cr-8Ni	Cast pipe	SA-451	CPF8	J92600	...
12	18Cr-8Ni	Forgings	SA-965	F304	S30400	...
13	18Cr-8Ni	Forgings	SA-965	F304H	S30409	...
14	18Cr-8Ni	Plate	SA/EN 10028-7	X2CrNi18-9	...	...
15	18Cr-8Ni	Forgings	SA-182	F304	S30400	...
16	18Cr-8Ni	Forgings	SA-182	F304H	S30409	...
17	18Cr-8Ni	Bolting	SA-193	B8	S30400	1
18	18Cr-8Ni	Bolting	SA-193	B8A	S30400	1A
19	18Cr-8Ni	Smls. tube	SA-213	TP304	S30400	...
20	18Cr-8Ni	Smls. tube	SA-213	TP304H	S30409	...
21	18Cr-8Ni	Plate	SA-240	302	S30200	...
22	18Cr-8Ni	Plate	SA-240	304	S30400	...
23	18Cr-8Ni	Plate	SA-240	304H	S30409	...
24	18Cr-8Ni	Wld. tube	SA-249	TP304	S30400	...
25	18Cr-8Ni	Wld. tube	SA-249	TP304H	S30409	...
26	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304	S30400	...
27	18Cr-8Ni	Smls. & wld. pipe	SA-312	TP304H	S30409	...
28	18Cr-8Ni	Bolting	SA-320	B8	S30400	1
29	18Cr-8Ni	Bolting	SA-320	B8A	S30400	1A
30	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	1
31	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	3
32	18Cr-8Ni	Wld. pipe	SA-358	304	S30400	4
33	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	1
34	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	3
35	18Cr-8Ni	Wld. pipe	SA-358	304H	S30409	4
36	18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	1
37	18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	3
38	18Cr-8Ni	Wld. pipe	SA-358	304LN	S30453	4
39	18Cr-8Ni	Smls. pipe	SA-376	TP304	S30400	...
40	18Cr-8Ni	Smls. pipe	SA-376	TP304H	S30409	...
41	18Cr-8Ni	Smls. & wld. fittings	SA-403	304	S30400	...
42	18Cr-8Ni	Smls. & wld. fittings	SA-403	304H	S30409	...
43	18Cr-8Ni	Wld. pipe	SA-409	TP304	S30400	...
44	18Cr-8Ni	Bar	SA-479	302	S30200	...
45	18Cr-8Ni	Bar	SA-479	304	S30400	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	70	25	...
2	...	70	25	...
3	...	70	25	...
4	...	70	25	...
5	>5	70	30	...
6	>5	70	30	...
7	...	70	30	...
8	...	70	30	...
9	≥8	70	30	...
10	...	70	30	...
11	...	70	30	...
12	...	70	30	...
13	...	70	30	...
14	≤3	72.5	29	...
15	≤5	75	30	...
16	≤5	75	30	...
17	...	75	30	...
18	...	75	30	...
19	...	75	30	...
20	...	75	30	...
21	...	75	30	...
22	...	75	30	...
23	...	75	30	...
24	...	75	30	...
25	...	75	30	...
26	...	75	30	...
27	...	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	75	30	...
32	...	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	<8	75	30	...
40	...	75	30	...
41	...	75	30	...
42	...	75	30	...
43	...	75	30	...
44	...	75	30	...
45	...	75	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
2	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
3	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
4	25.0	22.7	21.4	20.2	19.2	...	17.5	...	16.4
5	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
6	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
7	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
8	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
9	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
10	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
11	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
12	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
13	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
14	29.0	...	24.8	...	22.3	...	20.3	...	19.0
15	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
16	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
17	30.0	...	25.0	...	22.4	...	20.7	...	19.4
18	30.0	...	25.0	...	22.4	...	20.7	...	19.4
19	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
20	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
21	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
22	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
23	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
24	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
25	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
26	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
27	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
28	30.0	...	25.0	...	22.4	...	20.7	...	19.4
29	30.0	...	25.0	...	22.4	...	20.7	...	19.4
30	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
31	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
32	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
33	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
34	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
35	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
36	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
37	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
38	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
39	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
40	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
41	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
42	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
43	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
44	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
45	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
2	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
3	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
4	...	15.5	15.2	15.0	14.7	14.5	14.3	14.0	13.7	13.3
5	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
6	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
7	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
8	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
9	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
10	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
11	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
12	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
13	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
14	...	18.0	17.7	17.4	17.1	16.8	16.6	16.3	15.9	15.4
15	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
16	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
17	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
18	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
19	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
20	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
21	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
22	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
23	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
24	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
25	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
26	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
27	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
28	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
29	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
30	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
31	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
32	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
33	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
34	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
35	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
36	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
37	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
38	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
39	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
40	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
41	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
42	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
43	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
44	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
45	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
2	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
3	13.2	12.3	12.0	11.6	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
18	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
19	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
29	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
30	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
31	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
32	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	18Cr-8Ni	Bar	SA-479	304H	S30409	...
2	18Cr-8Ni	Wld. tube	SA-688	TP304	S30400	...
3	18Cr-8Ni	Wld. pipe	SA-813	TP304	S30400	...
4	18Cr-8Ni	Wld. pipe	SA-813	TP304H	S30409	...
5	18Cr-8Ni	Wld. pipe	SA-814	TP304	S30400	...
6	18Cr-8Ni	Wld. pipe	SA-814	TP304H	S30409	...
7	18Cr-8Ni	Bar	SA/JIS G4303	SUS302	...	...
8	18Cr-8Ni	Bar	SA/JIS G4303	SUS304	...	...
9	18Cr-8Ni	Plate	SA/EN 10028-7	X5CrNi18-10	...	...
10	18Cr-8Ni	Castings	SA-351	CF3A	J92500	...
11	18Cr-8Ni	Castings	SA-351	CF8A	J92600	...
12	18Cr-8Ni	Cast pipe	SA-451	CPF3A	J92500	...
13	18Cr-8Ni	Cast pipe	SA-451	CPF8A	J92600	...
14	18Cr-8Ni	Bolting	SA-193	B8	S30400	2
15	18Cr-8Ni	Bolting	SA-320	B8	S30400	2
16	18Cr-8Ni	Bolting	SA-193	B8	S30400	2
17	18Cr-8Ni	Bolting	SA-320	B8	S30400	2
18	18Cr-8Ni	Bolting	SA-193	B8	S30400	2
19	18Cr-8Ni	Bolting	SA-320	B8	S30400	2
20	18Cr-8Ni	Bolting	SA-193	B8	S30400	2
21	18Cr-8Ni	Bolting	SA-320	B8	S30400	2
22	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...
23	18Cr-8Ni-N	Forgings	SA-965	F304LN	S30453	...
24	18Cr-8Ni-N	Forgings	SA-182	F304LN	S30453	...
25	18Cr-8Ni-N	Bolting	SA-193	B8NA	S30451	1A
26	18Cr-8Ni-N	Smls. tube	SA-213	TP304LN	S30453	...
27	18Cr-8Ni-N	Plate	SA-240	304LN	S30453	...
28	18Cr-8Ni-N	Wld. tube	SA-249	TP304LN	S30453	...
29	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304LN	S30453	...
30	18Cr-8Ni-N	Smls. pipe	SA-376	TP304LN	S30453	...
31	18Cr-8Ni-N	Smls. & wld. fittings	SA-403	304LN	S30453	WP
32	18Cr-8Ni-N	Bar	SA-479	304LN	S30453	...
33	18Cr-8Ni-N	Wld. tube	SA-688	TP304LN	S30453	...
34	18Cr-8Ni-N	Wld. pipe	SA-813	TP304LN	S30453	...
35	18Cr-8Ni-N	Wld. pipe	SA-814	TP304LN	S30453	...
36	18Cr-8Ni-N	Forgings	SA-182	F304N	S30451	...
37	18Cr-8Ni-N	Smls. tube	SA-213	TP304N	S30451	...
38	18Cr-8Ni-N	Plate	SA-240	304N	S30451	...
39	18Cr-8Ni-N	Wld. tube	SA-249	TP304N	S30451	...
40	18Cr-8Ni-N	Smls. & wld. pipe	SA-312	TP304N	S30451	...
41	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	1
42	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	3
43	18Cr-8Ni-N	Wld. pipe	SA-358	304N	S30451	4
44	18Cr-8Ni-N	Smls. pipe	SA-376	TP304N	S30451	...
45	18Cr-8Ni-N	Smls. & wld. fittings	SA-403	304N	S30451	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	75	30	...
2	...	75	30	...
3	...	75	30	...
4	...	75	30	...
5	...	75	30	...
6	...	75	30	...
7	...	75	30	...
8	...	75	30	...
9	≤ 3	75	31	...
10	...	77	35	...
11	...	77	35	...
12	...	77	35	...
13	...	77	35	...
14	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
15	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
16	$1 < t \leq 1\frac{1}{4}$	105	65	...
17	$1 < t \leq 1\frac{1}{4}$	105	65	...
18	$\frac{3}{4} < t \leq 1$	115	80	...
19	$\frac{3}{4} < t \leq 1$	115	80	...
20	$\leq \frac{3}{4}$	125	100	...
21	$\leq \frac{3}{4}$	125	100	...
22	> 5	70	30	...
23	...	70	30	...
24	≤ 5	75	30	...
25	...	75	30	...
26	...	75	30	...
27	...	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	75	30	...
32	...	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	80	35	...
37	...	80	35	...
38	...	80	35	...
39	...	80	35	...
40	...	80	35	...
41	...	80	35	...
42	...	80	35	...
43	...	80	35	...
44	...	80	35	...
45	...	80	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
2	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
3	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
4	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
5	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
6	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
7	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
8	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
9	30.5	...	25.4	...	22.8	...	21.0	...	19.7
10	35.0	31.2	29.2	27.5	26.2	...	24.1	...	22.6
11	35.0	31.2	29.2	27.5	26.2	...	24.1	...	22.6
12	35.0	31.2	29.2	27.5	26.2	...	24.1	...	22.6
13	35.0	31.2	29.2	27.5	26.2	...	24.1	...	22.6
14	50.0	44.5	41.7	39.3	37.3	...	34.5	...	32.3
15	50.0	44.5	41.7	39.3	37.3	...	34.5	...	32.3
16	65.0	57.9	54.2	51.1	48.5	...	44.9	...	42.0
17	65.0	57.9	54.2	51.1	48.5	...	44.9	...	42.0
18	80.0	71.2	66.7	62.9	59.7	...	55.2	...	51.7
19	80.0	71.2	66.7	62.9	59.7	...	55.2	...	51.7
20	100.0	89.0	83.3	78.7	74.7	...	69.0	...	64.7
21	100.0	89.0	83.3	78.7	74.7	...	69.0	...	64.7
22	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
23	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
24	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
25	30.0	...	25.0	...	22.4	...	20.7	...	19.4
26	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
27	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
28	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
29	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
30	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
31	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
32	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
33	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
34	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
35	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
36	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
37	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
38	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
39	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
40	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
41	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
42	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
43	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
44	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
45	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
2	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
3	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
4	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
5	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
6	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
7	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
8	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
9	...	18.7	18.3	17.9	17.5	17.1	16.8	16.4	16.1	15.8
10	...	21.5	21.0	20.5	20.1	19.7	19.3	18.9	18.5	18.1
11	...	21.5	21.0	20.5	20.1	19.7	19.3	18.9	18.5	18.1
12	...	21.5	21.0	20.5	20.1	19.7	19.3	18.9	18.5	18.1
13	...	21.5	21.0	20.5	20.1	19.7	19.3	18.9	18.5	18.1
14	...	30.7	30.0	29.3	28.7	28.2	27.5	27.0	26.5	25.8
15	...	30.7	30.0	29.3	28.7	28.2	27.5	27.0	26.5	25.8
16	...	39.9	39.0	38.1	37.3	36.6	35.8	35.1	34.5	33.6
17	...	39.9	39.0	38.1	37.3	36.6	35.8	35.1	34.5	33.6
18	...	49.1	48.0	46.9	45.9	45.1	44.0	43.2	42.4	41.3
19	...	49.1	48.0	46.9	45.9	45.1	44.0	43.2	42.4	41.3
20	...	61.3	60.0	58.7	57.3	56.3	55.0	54.0	53.0	51.7
21	...	61.3	60.0	58.7	57.3	56.3	55.0	54.0	53.0	51.7
22	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
23	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
24	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
25	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
26	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
27	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
28	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
29	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
30	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
31	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
32	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
33	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
34	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
35	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
36	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
37	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
38	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
39	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
40	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
41	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
42	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
43	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
44	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
45	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
3	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	15.2	14.9	14.5	14.0	13.5	12.9	12.3	11.5	10.7	9.7	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	18Cr-8Ni-N	Bar	SA-479	304N	S30451	...
2	18Cr-8Ni-N	Wld. tube	SA-688	TP304N	S30451	...
3	18Cr-8Ni-N	Wld. pipe	SA-813	TP304N	S30451	...
4	18Cr-8Ni-N	Wld. pipe	SA-814	TP304N	S30451	...
5	18Cr-8Ni-N	Forgings	SA-965	F304N	S30451	...
6	18Cr-8Ni-N	Plate	SA/EN 10028-7	X2CrNiN18-10	...	...
7	18Cr-8Ni-N	Plate	SA/EN 10028-7	X5CrNiN19-9	...	...
8	18Cr-8Ni-Se	Bolting	SA-320	B8F	S30323	1
9	18Cr-8Ni-Se	Bolting	SA-320	B8FA	S30323	1A
10	18Cr-8Ni-4Si-N	Bolting	SA-193	B8S	S21800	...
11	18Cr-8Ni-4Si-N	Bolting	SA-193	B8SA	S21800	...
12	18Cr-8Ni-4Si-N	Bar	SA-479	...	S21800	...
13	18Cr-9Ni-3Cu-Cb-N	Smls. tube	SA-213	...	S30432	...
14	18Cr-10Ni-Cb	Forgings	SA-965	F348H	S34809	...
15	18Cr-10Ni-Cb	Castings	SA-351	CF8C	J92710	...
16	18Cr-10Ni-Cb	Cast pipe	SA-451	CPF8C	J92710	...
17	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...
18	18Cr-10Ni-Cb	Forgings	SA-965	F347	S34700	...
19	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...
20	18Cr-10Ni-Cb	Forgings	SA-965	F347H	S34709	...
21	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...
22	18Cr-10Ni-Cb	Forgings	SA-965	F348	S34800	...
23	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...
24	18Cr-10Ni-Cb	Forgings	SA-182	F347	S34700	...
25	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	1
26	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347	S34700	...
27	18Cr-10Ni-Cb	Plate	SA-240	347	S34700	...
28	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347	S34700	...
29	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347	S34700	...
30	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	1
31	18Cr-10Ni-Cb	Bolting	SA-320	B8CA	S34700	1A
32	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	1
33	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	3
34	18Cr-10Ni-Cb	Wld. pipe	SA-358	347	S34700	4
35	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347	S34700	...
36	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	347	S34700	...
37	18Cr-10Ni-Cb	Wld. pipe	SA-409	TP347	S34700	...
38	18Cr-10Ni-Cb	Bar	SA-479	347	S34700	...
39	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347	S34700	...
40	18Cr-10Ni-Cb	Bar	SA/JIS G4303	SUS347	...	...
41	18Cr-10Ni-Cb	Forgings	SA-182	F347H	S34709	...
42	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347H	S34709	...
43	18Cr-10Ni-Cb	Plate	SA-240	347H	S34709	...
44	18Cr-10Ni-Cb	Wld. tube	SA-249	TP347H	S34709	...
45	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP347H	S34709	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	80	35	...
2	...	80	35	...
3	...	80	35	...
4	...	80	35	...
5	...	80	35	...
6	≤3	80	39	...
7	≤3	80	39	...
8	...	75	30	...
9	...	75	30	...
10	...	95	50	...
11	...	95	50	...
12	...	95	50	...
13	...	86	34	...
14	...	65	25	...
15	...	70	30	...
16	...	70	30	...
17	>5	70	30	...
18	...	70	30	...
19	>5	70	30	...
20	...	70	30	...
21	>5	70	30	...
22	...	70	30	...
23	>5	70	30	...
24	≤5	75	30	...
25	...	75	30	...
26	...	75	30	...
27	...	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	75	30	...
32	...	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	...	75	30	...
41	≤5	75	30	...
42	...	75	30	...
43	...	75	30	...
44	...	75	30	...
45	...	75	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
2	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
3	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
4	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
5	35.0	30.9	28.6	26.7	25.0	...	22.6	...	21.0
6	39.2	35.9	32.6	31.0	29.3	...	27.0	...	25.3
7	39.2	34.5	32.0	29.9	28.0	...	25.3	...	23.4
8	30.0	...	25.0	...	22.4	...	20.7	...	19.4
9	30.0	...	25.0	...	22.4	...	20.7	...	19.4
10	50.0	42.6	38.8	35.7	33.2	...	29.7	...	27.6
11	50.0	42.6	38.8	35.7	33.2	...	29.7	...	27.6
12	50.0	42.6	38.8	35.7	33.2	...	29.7	...	27.6
13	34.0	...	29.7	...	27.4	...	25.7	...	24.4
14	25.0	23.8	23.0	22.2	21.4	...	20.0	...	18.8
15	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
16	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
17	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
18	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
19	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
20	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
21	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
22	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
23	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
24	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
25	30.0	...	27.6	...	25.7	...	24.0	...	22.5
26	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
27	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
28	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
29	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
30	30.0	...	27.6	...	25.7	...	24.0	...	22.5
31	30.0	...	27.6	...	25.7	...	24.0	...	22.5
32	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
33	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
34	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
35	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
36	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
37	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
38	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
39	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
40	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
41	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
42	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
43	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
44	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
45	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
2	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
3	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
4	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
5	...	19.9	19.5	19.1	18.8	18.5	18.1	17.7	17.3	16.9
6	...	24.0	23.5	23.0	22.5	22.0	...	...	...	...
7	...	22.3	21.8	21.4	21.0	20.7	20.2	19.8	19.4	18.9
8	...	18.4	18.0	17.6	17.2	16.9	...	...	...	...
9	...	18.4	18.0	17.6	17.2	16.9	...	...	...	...
10	...	26.4	25.9	25.6	25.4	25.2	25.0	24.9	24.9	24.9
11	...	26.4	25.9	25.6	25.4	25.2	25.0	24.9	24.9	24.9
12	...	26.4	25.9	25.6	25.4	25.2	25.0	24.9	24.9	24.9
13	...	23.4	23.0	22.6	22.3	21.9	21.6	21.3	21.0	20.7
14	...	17.9	17.6	17.3	17.1	17.0	16.9	16.8	16.8	16.7
15	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
16	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
17	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
18	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
19	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
20	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
21	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
22	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
23	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
24	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
25	...	21.5	21.1	20.7	20.5	20.4	20.3	20.2	20.1	20.1
26	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
27	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
28	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
29	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
30	...	21.5	21.1	20.7	20.5	20.4	20.3	20.2	20.1	20.1
31	...	21.5	21.1	20.7	20.5	20.4	20.3	20.2	20.1	20.1
32	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
33	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
34	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
35	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
36	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
37	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
38	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
39	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
40	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
41	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
42	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
43	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
44	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
45	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
18	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
22	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
25	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
26	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
27	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
28	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
29	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
30	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
31	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
32	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
33	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
34	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
35	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
36	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
37	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
38	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
39	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP347H	S34709	...
2	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	347H	S34709	...
3	18Cr-10Ni-Cb	Bar	SA-479	347H	S34709	...
4	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP347H	S34709	...
5	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP347H	S34709	...
6	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347LN	S34751	...
7	18Cr-10Ni-Cb	Smls. pipe	SA-312	TP347LN	S34751	...
8	18Cr-10Ni-Cb	Forgings	SA-182	F348	S34800	...
9	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348	S34800	...
10	18Cr-10Ni-Cb	Plate	SA-240	348	S34800	...
11	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348	S34800	...
12	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP348	S34800	...
13	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	1
14	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	3
15	18Cr-10Ni-Cb	Wld. pipe	SA-358	348	S34800	4
16	18Cr-10Ni-Cb	Smls. pipe	SA-376	TP348	S34800	...
17	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	348	S34800	...
18	18Cr-10Ni-Cb	Wld. pipe	SA-409	TP348	S34800	...
19	18Cr-10Ni-Cb	Bar	SA-479	348	S34800	...
20	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348	S34800	...
21	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348	S34800	...
22	18Cr-10Ni-Cb	Forgings	SA-182	F348H	S34809	...
23	18Cr-10Ni-Cb	Smls. tube	SA-213	TP348H	S34809	...
24	18Cr-10Ni-Cb	Plate	SA-240	348H	S34809	...
25	18Cr-10Ni-Cb	Wld. tube	SA-249	TP348H	S34809	...
26	18Cr-10Ni-Cb	Smls. & wld. pipe	SA-312	TP348H	S34809	...
27	18Cr-10Ni-Cb	Smls. & wld. fittings	SA-403	348H	S34809	...
28	18Cr-10Ni-Cb	Bar	SA-479	348H	S34809	...
29	18Cr-10Ni-Cb	Wld. pipe	SA-813	TP348H	S34809	...
30	18Cr-10Ni-Cb	Wld. pipe	SA-814	TP348H	S34809	...
31	18Cr-10Ni-Cb	Smls. tube	SA-213	TP347HFG	S34710	...
32	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2
33	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2
34	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2
35	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2
36	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2
37	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2
38	18Cr-10Ni-Cb	Bolting	SA-193	B8C	S34700	2
39	18Cr-10Ni-Cb	Bolting	SA-320	B8C	S34700	2
40	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321	S32100	...
41	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...
42	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321H	S32109	...
43	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...
44	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...
45	18Cr-10Ni-Ti	Forgings	SA-965	F321	S32100	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	75	30	...
2	...	75	30	...
3	...	75	30	...
4	...	75	30	...
5	...	75	30	...
6	...	75	30	...
7	...	75	30	...
8	≤ 5	75	30	...
9	...	75	30	...
10	...	75	30	...
11	...	75	30	...
12	...	75	30	...
13	...	75	30	...
14	...	75	30	...
15	...	75	30	...
16	...	75	30	...
17	...	75	30	...
18	...	75	30	...
19	...	75	30	...
20	...	75	30	...
21	...	75	30	...
22	≤ 5	75	30	...
23	...	75	30	...
24	...	75	30	...
25	...	75	30	...
26	...	75	30	...
27	...	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	80	30	...
32	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
33	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
34	$1 < t \leq 1\frac{1}{4}$	105	65	...
35	$1 < t \leq 1\frac{1}{4}$	105	65	...
36	$\frac{3}{4} < t \leq 1$	115	80	...
37	$\frac{3}{4} < t \leq 1$	115	80	...
38	$\leq \frac{3}{4}$	125	100	...
39	$\leq \frac{3}{4}$	125	100	...
40	$> \frac{3}{8}$	70	25	...
41	$> \frac{3}{8}$	70	25	...
42	$> \frac{3}{16}$	70	25	...
43	$> \frac{3}{8}$	70	25	...
44	> 5	70	30	...
45	...	70	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
2	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
3	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
4	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
5	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
6	30.0	...	26.5	...	24.0	...	21.9	...	20.4
7	30.0	...	26.5	...	24.0	...	21.9	...	20.4
8	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
9	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
10	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
11	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
12	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
13	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
14	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
15	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
16	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
17	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
18	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
19	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
20	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
21	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
22	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
23	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
24	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
25	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
26	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
27	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
28	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
29	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
30	30.0	28.6	27.6	26.6	25.7	...	24.0	...	22.6
31	30.0	...	27.1	...	25.3	...	23.9	...	22.8
32	50.0	...	46.0	...	42.8	...	40.0	...	37.7
33	50.0	...	46.0	...	42.8	...	40.0	...	37.7
34	65.0	...	59.8	...	55.7	...	52.0	...	49.0
35	65.0	...	59.8	...	55.7	...	52.0	...	49.0
36	80.0	...	73.6	...	68.5	...	64.0	...	60.3
37	80.0	...	73.6	...	68.5	...	64.0	...	60.3
38	100.0	...	92.0	...	85.7	...	80.0	...	75.3
39	100.0	...	92.0	...	85.7	...	80.0	...	75.3
40	25.0	23.4	22.5	21.5	20.7	...	19.2	...	17.9
41	25.0	23.4	22.5	21.5	20.7	...	19.2	...	17.9
42	25.0	23.4	22.5	21.5	20.7	...	19.2	...	17.9
43	25.0	23.4	22.5	21.5	20.7	...	19.2	...	17.9
44	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
45	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
2	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
3	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
4	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
5	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
6	...	19.4	19.1	18.9	18.7	18.7	18.6	18.6	18.6	18.6
7	...	19.4	19.1	18.9	18.7	18.7	18.6	18.6	18.6	18.6
8	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
9	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
10	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
11	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
12	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
13	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
14	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
15	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
16	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
17	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
18	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
19	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
20	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
21	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
22	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
23	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
24	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
25	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
26	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
27	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
28	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
29	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
30	...	21.5	21.1	20.7	20.5	20.3	20.2	20.2	20.1	20.1
31	...	21.9	21.5	21.2	20.9	20.6	20.4	20.2	19.9	19.7
32	...	35.8	35.2	34.5	34.2	33.8	33.7	33.7	33.5	33.5
33	...	35.8	35.2	34.5	34.2	33.8	33.7	33.7	33.5	33.5
34	...	46.6	45.7	44.9	44.4	44.0	43.8	43.8	43.6	43.6
35	...	46.6	45.7	44.9	44.4	44.0	43.8	43.8	43.6	43.6
36	...	57.3	56.3	55.2	54.7	54.1	53.9	53.9	53.6	53.6
37	...	57.3	56.3	55.2	54.7	54.1	53.9	53.9	53.6	53.6
38	...	71.7	70.3	69.0	68.3	67.7	67.3	67.3	67.0	67.0
39	...	71.7	70.3	69.0	68.3	67.7	67.3	67.3	67.0	67.0
40	...	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.2	15.0
41	...	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.2	15.0
42	...	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.2	15.0
43	...	16.9	16.5	16.2	15.9	15.7	15.5	15.3	15.2	15.0
44	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
45	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
9	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
10	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
11	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
12	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
13	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
14	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
15	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
16	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
17	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
18	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
19	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
20	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
21	19.7	19.4	19.0	18.5	17.8	17.0	15.9	14.7	13.3	11.7	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	14.8	14.6	14.2	13.9	13.5	13.0	12.5	11.9	11.2	10.4	...	...	...
41	14.8	14.6	14.2	13.9	13.5	13.0	12.5	11.9	11.2	10.4	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
45	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...
2	18Cr-10Ni-Ti	Forgings	SA-965	F321H	S32109	...
3	18Cr-10Ni-Ti	Plate	SA/EN 10028-7	X6CrNiTi18-10	...	...
4	18Cr-10Ni-Ti	Forgings	SA-182	F321	S32100	...
5	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	1
6	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321	S32100	...
7	18Cr-10Ni-Ti	Plate	SA-240	321	S32100	...
8	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321	S32100	...
9	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321	S32100	...
10	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	1
11	18Cr-10Ni-Ti	Bolting	SA-320	B8TA	S32100	1A
12	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	1
13	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	3
14	18Cr-10Ni-Ti	Wld. pipe	SA-358	321	S32100	4
15	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321	S32100	...
16	18Cr-10Ni-Ti	Smls. & wld. fittings	SA-403	321	S32100	...
17	18Cr-10Ni-Ti	Wld. pipe	SA-409	TP321	S32100	...
18	18Cr-10Ni-Ti	Bar	SA-479	321	S32100	...
19	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321	S32100	...
20	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321	S32100	...
21	18Cr-10Ni-Ti	Bar	SA/JIS G4303	SUS321	...	...
22	18Cr-10Ni-Ti	Forgings	SA-182	F321H	S32109	...
23	18Cr-10Ni-Ti	Smls. tube	SA-213	TP321H	S32109	...
24	18Cr-10Ni-Ti	Plate	SA-240	321H	S32109	...
25	18Cr-10Ni-Ti	Wld. tube	SA-249	TP321H	S32109	...
26	18Cr-10Ni-Ti	Smls. & wld. pipe	SA-312	TP321H	S32109	...
27	18Cr-10Ni-Ti	Smls. pipe	SA-376	TP321H	S32109	...
28	18Cr-10Ni-Ti	Smls. & wld. fittings	SA-403	321H	S32109	...
29	18Cr-10Ni-Ti	Bar	SA-479	321H	S32109	...
30	18Cr-10Ni-Ti	Wld. pipe	SA-813	TP321H	S32109	...
31	18Cr-10Ni-Ti	Wld. pipe	SA-814	TP321H	S32109	...
32	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2
33	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2
34	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2
35	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2
36	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2
37	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2
38	18Cr-10Ni-Ti	Bolting	SA-193	B8T	S32100	2
39	18Cr-10Ni-Ti	Bolting	SA-320	B8T	S32100	2
40	18Cr-11Ni	Bolting	SA-193	B8P	S30500	1
41	18Cr-11Ni	Plate	SA-240	305	S30500	...
42	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2
43	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2
44	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2
45	18Cr-11Ni	Bolting	SA-193	B8P	S30500	2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	>5	70	30	...
2	...	70	30	...
3	≤ 3	73	29	...
4	≤ 5	75	30	...
5	...	75	30	...
6	...	75	30	...
7	...	75	30	...
8	...	75	30	...
9	$\leq \frac{3}{8}$	75	30	...
10	...	75	30	...
11	...	75	30	...
12	...	75	30	...
13	...	75	30	...
14	...	75	30	...
15	$\leq \frac{3}{8}$	75	30	...
16	...	75	30	...
17	...	75	30	...
18	...	75	30	...
19	...	75	30	...
20	...	75	30	...
21	...	75	30	...
22	≤ 5	75	30	...
23	...	75	30	...
24	...	75	30	...
25	...	75	30	...
26	$\leq \frac{3}{16}$	75	30	...
27	$\leq \frac{3}{8}$	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	75	30	...
32	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
33	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
34	$1 < t \leq 1\frac{1}{4}$	105	65	...
35	$1 < t \leq 1\frac{1}{4}$	105	65	...
36	$\frac{3}{4} < t \leq 1$	115	80	...
37	$\frac{3}{4} < t \leq 1$	115	80	...
38	$\leq \frac{3}{4}$	125	100	...
39	$\leq \frac{3}{4}$	125	100	...
40	...	75	30	...
41	...	75	30	...
42	$1\frac{1}{4} < t \leq 1\frac{1}{2}$	100	50	...
43	$1 < t \leq 1\frac{1}{4}$	105	65	...
44	$\frac{3}{4} < t \leq 1$	115	80	...
45	$\leq \frac{3}{4}$	125	100	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
2	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
3	29.0	27.2	26.1	25.0	24.0	...	22.2	...	20.8
4	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
5	30.0	...	27.0	...	24.8	...	23.0	...	21.5
6	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
7	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
8	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
9	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
10	30.0	...	27.0	...	24.8	...	23.0	...	21.5
11	30.0	...	27.0	...	24.8	...	23.0	...	21.5
12	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
13	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
14	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
15	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
16	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
17	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
18	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
19	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
20	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
21	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
22	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
23	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
24	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
25	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
26	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
27	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
28	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
29	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
30	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
31	30.0	28.1	27.0	25.8	24.8	...	23.0	...	21.5
32	50.0	...	45.0	...	41.3	...	38.3	...	35.8
33	50.0	...	45.0	...	41.3	...	38.3	...	35.8
34	65.0	...	58.5	...	53.7	...	49.8	...	46.6
35	65.0	...	58.5	...	53.7	...	49.8	...	46.6
36	80.0	...	72.0	...	66.1	...	61.3	...	57.3
37	80.0	...	72.0	...	66.1	...	61.3	...	57.3
38	100.0	...	90.0	...	82.7	...	76.7	...	71.7
39	100.0	...	90.0	...	82.7	...	76.7	...	71.7
40	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
41	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
42	50.0	44.5	41.7	39.3	37.3	...	34.5	...	32.3
43	65.0	57.9	54.2	51.1	48.5	...	44.9	...	42.0
44	80.0	71.2	66.7	62.9	59.7	...	55.2	...	51.7
45	100.0	89.0	83.3	78.7	74.7	...	69.0	...	64.7

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
									Ferrous Materials (Cont'd)	
1	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
2	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
3	...	19.6	19.2	18.8	18.5	18.2	18.0	17.8	17.6	17.4
4	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
5	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
6	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
7	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
8	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
9	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
10	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
11	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
12	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
13	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
14	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
15	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
16	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
17	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
18	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
19	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
20	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
21	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
22	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
23	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
24	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
25	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
26	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
27	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
28	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
29	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
30	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
31	...	20.3	19.8	19.4	19.1	18.8	18.6	18.4	18.2	18.0
32	...	33.8	33.0	32.3	31.8	31.3	31.0	30.7	30.3	30.0
33	...	33.8	33.0	32.3	31.8	31.3	31.0	30.7	30.3	30.0
34	...	44.0	42.9	42.0	41.4	40.7	40.3	39.9	39.4	39.0
35	...	44.0	42.9	42.0	41.4	40.7	40.3	39.9	39.4	39.0
36	...	54.1	52.8	51.7	50.9	50.1	49.6	49.1	48.5	48.0
37	...	54.1	52.8	51.7	50.9	50.1	49.6	49.1	48.5	48.0
38	...	67.7	66.0	64.7	63.7	62.7	62.0	61.3	60.7	60.0
39	...	67.7	66.0	64.7	63.7	62.7	62.0	61.3	60.7	60.0
40	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
41	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
42	...	30.7	30.0	29.3	28.7	28.2	27.5	27.0	26.5	25.8
43	...	39.9	39.0	38.1	37.3	36.6	35.8	35.1	34.5	33.6
44	...	49.1	48.0	46.9	45.9	45.1	44.0	43.2	42.4	41.3
45	...	61.3	60.0	58.7	57.3	56.3	55.0	54.0	53.0	51.7

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
5	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
6	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
7	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
8	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
9	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
10	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
11	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
12	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
13	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
14	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
15	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
16	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
17	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
18	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
19	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
20	17.8	17.5	17.1	16.7	16.2	15.6	15.0	14.3	13.4	12.5	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
(23) 1	18Cr-12Ni-2Mo	Castings	SA-351	CF3M	J92800	...
(23) 2	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF3M	J92800	...
(23) 3	18Cr-12Ni-2Mo	Castings	SA-351	CF8M	J92900	...
(23) 4	18Cr-12Ni-2Mo	Cast pipe	SA-451	CPF8M	J92900	...
5	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...
6	18Cr-13Ni-3Mo	Forgings	SA-182	F317L	S31703	...
7	18Cr-13Ni-3Mo	Forgings	SA-182	F317	S31700	...
8	18Cr-13Ni-3Mo	Plate	SA-240	317	S31700	...
9	18Cr-13Ni-3Mo	Plate	SA-240	317L	S31703	...
10	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317	S31700	...
11	18Cr-13Ni-3Mo	Wld. tube	SA-249	TP317L	S31703	...
12	18Cr-13Ni-3Mo	Smls. & wld. pipe	SA-312	TP317	S31700	...
13	18Cr-13Ni-3Mo	Smls. & wld. pipe	SA-312	TP317L	S31703	...
14	18Cr-13Ni-3Mo	Smls. & wld. fittings	SA-403	317	S31700	...
15	18Cr-13Ni-3Mo	Fittings	SA-403	317L	S31703	...
16	18Cr-15Ni-4Si	Forgings	SA-182	...	S30600	Solution ann.
17	18Cr-15Ni-4Si	Plate	SA-240	...	S30600	Solution ann.
18	18Cr-15Ni-4Si	Smls. & wld. pipe	SA-312	...	S30600	Solution ann.
19	18Cr-15Ni-4Si	Bar	SA-479	...	S30600	Solution ann.
20	18Cr-18Ni-2Si	Smls. tube	SA-213	XM-15	S38100	...
21	18Cr-18Ni-2Si	Plate	SA-240	XM-15	S38100	...
22	18Cr-18Ni-2Si	Wld. tube	SA-249	TPXM-15	S38100	...
23	18Cr-18Ni-2Si	Wld. pipe	SA-312	TPXM-15	S38100	...
24	18Cr-20Ni-5.5Si	Smls. tube	SA-213	...	S32615	Solution ann.
25	18Cr-20Ni-5.5Si	Plate	SA-240	...	S32615	Solution ann.
26	18Cr-20Ni-5.5Si	Smls. & wld. pipe	SA-312	...	S32615	Solution ann.
27	18Cr-20Ni-5.5Si	Bar	SA-479	...	S32615	Solution ann.
28	19Cr-9Ni- $\frac{1}{2}$ Mo	Castings	SA-351	CF10	J92590	...
29	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B
30	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	B
31	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A
32	19Cr-9Ni-Mo-W	Bolting	SA-453	651	S63198	A
33	19Cr-9Ni-2Mo	Castings	SA-351	CF10M	...	...
34	19Cr-10Ni-3Mo	Castings	SA-351	CG8M	J93000	...
35	19Cr-15Ni-4Mo	Smls. tube	SA-213	...	S31725	...
36	19Cr-15Ni-4Mo	Plate	SA-240	...	S31725	...
37	19Cr-15Ni-4Mo	Wld. tube	SA-249	...	S31725	...
38	19Cr-15Ni-4Mo	Smls. & wld. pipe	SA-312	...	S31725	...
39	19Cr-15Ni-4Mo	Wld. pipe	SA-358	...	S31725	...
40	19Cr-15Ni-4Mo	Smls. pipe	SA-376	...	S31725	...
41	19Cr-15Ni-4Mo	Wld. pipe	SA-409	...	S31725	...
42	19Cr-15Ni-4Mo	Bar	SA-479	...	S31725	...
43	20Cr-3Ni-1.5Mo-N	Plate	SA-240	...	S32003	...
44	20Cr-3Ni-1.5Mo-N	Wld. pipe	SA-790	...	S32003	...
45	20Cr-3Ni-1.5Mo-N	Sheet	SA-240	...	S32003	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	70	30	...
2	...	70	30	...
3	...	70	30	...
4	...	70	30	...
5	>5	65	25	...
6	≤5	70	25	...
7	≤5	75	30	...
8	...	75	30	...
9	...	75	30	...
10	...	75	30	...
11	...	75	30	...
12	...	75	30	...
13	...	75	30	...
14	...	75	30	...
15	...	75	30	...
16	...	78	35	...
17	≤2	78	35	...
18	...	78	35	...
19	≤4	78	35	...
20	...	75	30	...
21	...	75	30	...
22	...	75	30	...
23	...	75	30	...
24	...	80	32	...
25	...	80	32	...
26	...	80	32	...
27	...	80	32	...
28	...	70	30	...
29	>3	95	50	...
30	≤3	95	60	...
31	>3	100	60	...
32	≤3	100	70	...
33	...	70	30	...
34	...	75	35	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	...	75	30	...
41	...	75	30	...
42	...	75	30	...
43	> ³ / ₁₆	95	65	...
44	...	95	65	...
45	≤ ³ / ₁₆	100	70	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	27.3	25.8	24.5	23.3	...	21.4	...	19.9
2	30.0	27.3	25.8	24.5	23.3	...	21.4	...	19.9
3	30.0	27.3	25.8	24.5	23.3	...	21.4	...	19.9
4	30.0	27.3	25.8	24.5	23.3	...	21.4	...	19.9
5	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
6	25.0	22.7	21.3	20.1	19.0	...	17.5	...	16.4
7	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
8	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
9	30.0	27.3	25.5	24.1	22.8	...	21.0	...	19.7
10	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
11	30.0	27.3	25.5	24.1	22.8	...	21.0	...	19.7
12	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
13	30.0	27.3	25.5	24.1	22.8	...	21.0	...	19.7
14	30.0	27.4	25.9	24.6	23.4	...	21.4	...	20.0
15	30.0	27.3	25.5	24.1	22.8	...	21.0	...	19.7
16	35.0	...	26.9	...	24.2	...	...	...	...
17	35.0	...	26.9	...	24.2	...	...	...	...
18	35.0	...	26.9	...	24.2	...	...	...	...
19	35.0	...	26.9	...	24.2	...	...	...	...
20	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
21	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
22	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
23	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
24	32.0	...	26.4	...	24.8	...	23.1	...	...
25	32.0	...	26.4	...	24.8	...	23.1	...	...
26	32.0	...	26.4	...	24.8	...	23.1	...	...
27	32.0	...	26.4	...	24.8	...	23.1	...	...
28	30.0	26.7	25.0	23.6	22.4	...	20.6	...	19.3
29	50.0	...	46.4	...	44.3	...	42.5	...	41.1
30	60.0	...	55.7	...	53.1	...	51.1	...	49.4
31	60.0	...	55.7	...	53.1	...	51.1	...	49.4
32	70.0	...	65.0	...	62.0	...	59.6	...	57.6
33	30.0	27.7	26.2	24.8	23.5	...	21.4	...	19.9
34	35.0	30.5	28.1	26.2	24.5	...	22.1	...	20.5
35	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
36	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
37	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
38	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
39	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
40	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
41	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
42	30.0	27.0	25.3	24.0	22.8	...	21.0	...	19.7
43	65.0	...	55.8	...	50.6	...	47.6	...	46.0
44	65.0	...	55.8	...	50.6	...	47.6	...	46.0
45	70.0	...	60.1	...	54.5	...	51.3	...	49.5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	18.8	18.4	18.1	17.8	17.6	17.4	17.3	17.1	17.0
2	...	18.8	18.4	18.1	17.8	17.6	17.4	17.3	17.1	17.0
3	...	18.8	18.4	18.1	17.8	17.6	17.4	17.3	17.1	17.0
4	...	18.8	18.4	18.1	17.8	17.6	17.4	17.3	17.1	17.0
5	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
6	...	15.6	15.3	15.0	14.7	14.4	14.1	13.8	13.5	13.2
7	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
8	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
9	...	18.7	18.3	18.0	17.6	17.2	16.9	16.5	16.1	15.8
10	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
11	...	18.7	18.3	18.0	17.6	17.2	16.9	16.5	16.1	15.8
12	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
13	...	18.7	18.3	18.0	17.6	17.2	16.9	16.5	16.1	15.8
14	...	18.9	18.5	18.2	17.9	17.7	17.5	17.3	17.1	17.0
15	...	18.7	18.3	18.0	17.6	17.2	16.9	16.5	16.1	15.8
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
21	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
22	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
23	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	18.4	17.9	17.6	17.2	16.9	16.6	16.3	15.9	15.6
29	...	39.9	39.4	38.9	38.3	37.8	37.3	36.7	36.0	35.4
30	...	47.9	47.3	46.6	46.0	45.4	44.7	44.0	43.3	42.4
31	...	47.9	47.3	46.6	46.0	45.4	44.7	44.0	43.3	42.4
32	...	55.9	55.1	54.4	53.7	52.9	52.2	51.3	50.5	49.5
33	...	18.8	18.5	18.1	17.9	17.6	17.4	17.2	17.0	16.9
34	...	19.4	19.0	18.7	18.4	18.2	18.0	17.7	17.4	17.0
35	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
36	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
37	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
38	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
39	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
40	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
41	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
42	...	18.7	18.3	18.0	17.6	17.3	16.9	16.6	16.2	15.9
43	...	44.6	43.6	42.6	41.6	40.9	40.9	...	...	...
44	...	44.6	43.6	42.6	41.6	40.9	40.9	...	...	...
45	...	48.0	47.0	45.9	44.8	44.0	44.0	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
6	13.1	13.0	12.8	12.5	...	...	...	...	...	...	...	...	...
7	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
8	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
9	15.7	15.6	15.3	15.1	...	...	...	...	...	...	...	...	...
10	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
11	15.7	15.6	15.3	15.1	...	...	...	...	...	...	...	...	...
12	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
13	15.7	15.6	15.3	15.1	...	...	...	...	...	...	...	...	...
14	16.5	16.3	16.1	15.9	15.7	15.5	15.3	15.0	14.6	14.3	...	...	...
15	15.7	15.6	15.3	15.1	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	20Cr-3Ni-1.5Mo-N	Smls. & wld. tube	SA-789	...	S32003	...
2	20Cr-10Ni	Bar	SA-479	ER308	S30880	...
3	20Cr-18Ni-6Mo	Castings	SA-351	CK3MCuN	J93254	...
4	20Cr-18Ni-6Mo	Forgings	SA-182	F44	S31254	...
5	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...
6	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...
7	20Cr-18Ni-6Mo	Smls. & wld. pipe	SA-312	...	S31254	...
8	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...
9	20Cr-18Ni-6Mo	Smls. tube	SA-213	...	S31254	...
10	20Cr-18Ni-6Mo	Wld. tube	SA-249	...	S31254	...
11	20Cr-18Ni-6Mo	Smls. & wld. pipe	SA-312	...	S31254	...
12	20Cr-18Ni-6Mo	Plate	SA-240	...	S31254	...
13	20Cr-18Ni-6Mo	Wld. pipe	SA-358	...	S31254	...
(23) 14	20.5Cr-8.8Ni-Mo-N	Plate	SA-240	...	S31655	...
15	21Cr-5Mn-1.5Ni-Cu-N	Plate	SA-240	...	S32101	...
16	21Cr-5Mn-1.5Ni-Cu-N	Bar	SA-479	...	S32101	...
17	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. tube	SA-789	...	S32101	...
18	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. pipe	SA-790	...	S32101	...
19	21Cr-5Mn-1.5Ni-Cu-N	Fittings	SA-815	...	S32101	...
20	21Cr-5Mn-1.5Ni-Cu-N	Sheet, strip	SA-240	...	S32101	...
21	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. tube	SA-789	...	S32101	...
22	21Cr-5Mn-1.5Ni-Cu-N	Smls. & wld. pipe	SA-790	...	S32101	...
23	21Cr-6Ni-9Mn	Forgings	SA-182	FXM-11	S21904	...
24	21Cr-6Ni-9Mn	Smls. & wld. pipe	SA-312	TPXM-11	S21904	...
25	21Cr-6Ni-9Mn	Plate	SA-666	XM-11	S21904	...
26	21Cr-6Ni-9Mn	Forgings	SA-965	FXM-11	S21904	...
27	21Cr-11Ni-N	Forgings	SA-182	F45	S30815	...
28	21Cr-11Ni-N	Smls. tube	SA-213	...	S30815	...
29	21Cr-11Ni-N	Plate	SA-240	...	S30815	...
30	21Cr-11Ni-N	Wld. tube	SA-249	...	S30815	...
31	21Cr-11Ni-N	Smls. & wld. pipe	SA-312	...	S30815	...
32	21Cr-11Ni-N	Bar	SA-479	...	S30815	...
33	22Cr-2Ni-Mo-N	Forgings	SA-182	F66	S32202	...
34	22Cr-2Ni-Mo-N	Plate	SA-240	...	S32202	...
35	22Cr-2Ni-Mo-N	Bar	SA-479	...	S32202	...
36	22Cr-2Ni-Mo-N	Smls. & wld. tube	SA-789	...	S32202	...
37	22Cr-2Ni-Mo-N	Smls. & wld. pipe	SA-790	...	S32202	...
38	22Cr-2Ni-Mo-N	Smls. & wld. fittings	SA-815	...	S32202	...
39	22Cr-5Ni-3Mo-N	Castings	SA-995	4A	J92205	...
40	22Cr-5Ni-3Mo-N	Forgings	SA-182	F51	S31803	...
41	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S31803	...
42	22Cr-5Ni-3Mo-N	Bar	SA-479	...	S31803	...
43	22Cr-5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S31803	...
44	22Cr-5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S31803	...
45	22Cr-5Ni-3Mo-N	Smls. & wld. fittings	SA-815	...	S31803	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	100	70	...
2	...	75	30	...
3	...	80	38	...
4	...	94	44	...
5	$t > 0.187$	95	45	...
6	$t > 0.187$	95	45	...
7	$t > 0.187$	95	45	...
8	$t \geq 0.187$	95	45	...
9	$t \leq 0.187$	98	45	...
10	$t \leq 0.187$	98	45	...
11	$t \leq 0.187$	98	45	...
12	$t \leq 0.187$	100	45	...
13	$t < 0.187$	100	45	...
14	...	92	45	...
15	$> \frac{3}{16}$	94	65	...
16	...	94	65	...
17	$> \frac{3}{16}$	94	65	...
18	$> \frac{3}{16}$	94	65	...
19	...	94	65	...
20	$\leq \frac{3}{16}$	101	77	...
21	$\leq \frac{3}{16}$	101	77	...
22	$\leq \frac{3}{16}$	101	77	...
23	...	90	50	...
24	...	90	50	...
25	...	90	50	...
26	...	90	50	...
27	...	87	45	...
28	...	87	45	...
29	...	87	45	...
30	...	87	45	...
31	...	87	45	...
32	...	87	45	...
33	...	94	65	...
34	...	94	65	...
35	...	94	65	...
36	...	94	65	...
37	...	94	65	...
38	...	94	65	...
39	...	90	60	...
40	...	90	65	...
41	...	90	65	...
42	...	90	65	...
43	...	90	65	...
44	...	90	65	...
45	...	90	65	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	70.0	...	60.1	...	54.5	...	51.3	...	49.5
2	30.0	26.7	25.0	23.6	22.4	...	20.7	...	19.4
3	38.0	33.3	31.0	29.2	27.8	...	25.6	...	24.2
4	44.0	38.5	35.9	33.8	32.1	...	29.7	...	28.0
5	45.0	39.4	36.7	34.6	32.8	...	30.4	...	28.6
6	45.0	39.4	36.7	34.6	32.8	...	30.4	...	28.6
7	45.0	39.4	36.7	34.6	32.8	...	30.4	...	28.6
8	45.0	39.4	36.7	34.6	32.9	...	30.4	...	28.6
9	45.0	39.4	36.7	34.6	32.8	...	30.4	...	28.6
10	45.0	39.4	36.7	34.6	32.8	...	30.4	...	28.6
11	45.0	39.4	36.7	34.6	32.8	...	30.4	...	28.6
12	45.0	39.4	36.7	34.6	32.9	...	30.4	...	28.6
13	45.0	39.4	36.7	34.6	32.9	...	30.4	...	28.6
14	45.0	...	35.9	...	31.7	...	29.0	...	27.3
15	65.0	...	57.6	...	51.4	...	49.4	...	48.4
16	65.0	...	57.6	...	51.4	...	49.4	...	48.4
17	65.0	...	57.6	...	51.4	...	49.4	...	48.4
18	65.0	...	57.6	...	51.4	...	49.4	...	48.4
19	65.0	...	57.6	...	51.4	...	49.4	...	48.4
20	77.0	...	68.2	...	60.9	...	58.5	...	57.3
21	77.0	...	68.2	...	60.9	...	58.5	...	57.3
22	77.0	...	68.2	...	60.9	...	58.5	...	57.3
23	50.0	42.5	38.6	35.5	33.0	...	29.4	...	27.1
24	50.0	42.5	38.6	35.5	33.0	...	29.4	...	27.1
25	50.0	42.5	38.6	35.5	33.0	...	29.4	...	27.1
26	50.0	42.5	38.6	35.5	33.0	...	29.4	...	27.1
27	45.0	40.2	37.5	35.1	33.0	...	29.9	...	27.8
28	45.0	40.2	37.5	35.1	33.0	...	29.9	...	27.8
29	45.0	40.2	37.5	35.1	33.0	...	29.9	...	27.8
30	45.0	40.2	37.5	35.1	33.0	...	29.9	...	27.8
31	45.0	40.2	37.5	35.1	33.0	...	29.9	...	27.8
32	45.0	40.2	37.5	35.1	33.0	...	29.9	...	27.8
33	65.0	59.6	55.5	52.0	49.3	47.5	46.5	45.9	45.5
34	65.0	59.6	55.5	52.0	49.3	47.5	46.5	45.9	45.5
35	65.0	59.6	55.5	52.0	49.3	47.5	46.5	45.9	45.5
36	65.0	59.6	55.5	52.0	49.3	47.5	46.5	45.9	45.5
37	65.0	59.6	55.5	52.0	49.3	47.5	46.5	45.9	45.5
38	65.0	59.6	55.5	52.0	49.3	47.5	46.5	45.9	45.5
39	60.0	60.0	53.9	...	47.9	...	44.5	...	42.3
40	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
41	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
42	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
43	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
44	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
45	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	48.0	47.0	45.9	44.8	44.0	44.0	...	...	...
2	...	18.4	18.0	17.6	17.2	16.9	16.5	16.2	15.9	15.5
3	...	23.2	22.8	22.6	22.4	22.3	22.1	...	...	...
4	...	26.8	26.4	26.2	26.0	25.8	25.6	...	...	...
5	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
6	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
7	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
8	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
9	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
10	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
11	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
12	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
13	...	27.4	27.0	26.8	26.6	26.4	26.2	...	...	...
14	...	26.1	25.6	25.1	24.6	24.1	23.6	...	...	...
15	...	46.0	45.5	...	...	...	...	...	...	...
16	...	46.0	45.5	...	...	...	...	...	...	...
17	...	46.0	45.5	...	...	...	...	...	...	...
18	...	46.0	45.5	...	...	...	...	...	...	...
19	...	46.0	45.5	...	...	...	...	...	...	...
20	...	54.5	53.9	...	...	...	...	...	...	...
21	...	54.5	53.9	...	...	...	...	...	...	...
22	...	54.5	53.9	...	...	...	...	...	...	...
23	...	25.7	25.3	25.0	24.8	24.6	24.4	24.1	23.5	22.6
24	...	25.7	25.3	25.0	24.8	24.6	24.4	24.1	23.5	22.6
25	...	25.7	25.3	25.0	24.8	24.6	24.4	24.1	23.5	22.6
26	...	25.7	25.3	25.0	24.8	24.6	24.4	24.1	23.5	22.6
27	...	26.5	26.1	25.8	25.5	25.2	25.0	24.7	24.3	23.9
28	...	26.5	26.1	25.8	25.5	25.2	25.0	24.7	24.3	23.9
29	...	26.5	26.1	25.8	25.5	25.2	25.0	24.7	24.3	23.9
30	...	26.5	26.1	25.8	25.5	25.2	25.0	24.7	24.3	23.9
31	...	26.5	26.1	25.8	25.5	25.2	25.0	24.7	24.3	23.9
32	...	26.5	26.1	25.8	25.5	25.2	25.0	24.7	24.3	23.9
33	44.9	43.9	42.5	...	...	...	...	...	...	...
34	44.9	43.9	42.5	...	...	...	...	...	...	...
35	44.9	43.9	42.5	...	...	...	...	...	...	...
36	44.9	43.9	42.5	...	...	...	...	...	...	...
37	44.9	43.9	42.5	...	...	...	...	...	...	...
38	44.9	43.9	42.5	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	47.9	46.9	...	...	...	...	...	...	...
41	...	47.9	46.9	...	...	...	...	...	...	...
42	...	47.9	46.9	...	...	...	...	...	...	...
43	...	47.9	46.9	...	...	...	...	...	...	...
44	...	47.9	46.9	...	...	...	...	...	...	...
45	...	47.9	46.9	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	22Cr-5Ni-3Mo-N	Plate	SA-240	...	S32205	...
2	22Cr-5Ni-3Mo-N	Bar	SA-479	...	S32205	...
3	22Cr-5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S32205	...
4	22Cr-5Ni-3Mo-N	Smls. & wld. fittings	SA-815	...	S32205	...
5	22Cr-5Ni-3Mo-N	Forgings	SA-182	F60	S32205	...
6	22Cr-5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S32205	...
7	22Cr-13Ni-5Mn	Castings	SA-351	CG6MMN	J93790	...
8	22Cr-13Ni-5Mn	Forgings	SA-182	FXM-19	S20910	...
9	22Cr-13Ni-5Mn	Bolting	SA-193	B8R	S20910	Annealed
10	22Cr-13Ni-5Mn	Bolting	SA-193	B8RA	S20910	Annealed
11	22Cr-13Ni-5Mn	Smls. tube	SA-213	XM-19	S20910	...
12	22Cr-13Ni-5Mn	Plate	SA-240	XM-19	S20910	...
13	22Cr-13Ni-5Mn	Wld. tube	SA-249	TPXM-19	S20910	...
14	22Cr-13Ni-5Mn	Smls. & wld. pipe	SA-312	TPXM-19	S20910	...
15	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	1
16	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	3
17	22Cr-13Ni-5Mn	Wld. pipe	SA-358	XM-19	S20910	4
18	22Cr-13Ni-5Mn	Smls. & wld. fittings	SA-403	XM-19	S20910	...
19	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Annealed
20	22Cr-13Ni-5Mn	Wld. pipe	SA-813	TPXM-19	S20910	...
21	22Cr-13Ni-5Mn	Wld. pipe	SA-814	TPXM-19	S20910	...
22	22Cr-13Ni-5Mn	Forgings	SA-965	FXM-19	S20910	...
23	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Hot rolled
24	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Hot rolled
25	22Cr-13Ni-5Mn	Bar	SA-479	XM-19	S20910	Hot rolled
26	23Cr-4Ni-Mo-Cu-N	Plate	SA-240	...	S32304	...
27	23Cr-4Ni-Mo-Cu-N	Smls. & wld. tube	SA-789	...	S32304	...
28	23Cr-4Ni-Mo-Cu-N	Smls. & wld. pipe	SA-790	...	S32304	...
29	23Cr-4Ni-Mo-Cu-N	Smls. & wld. tube	SA-789	...	S32304	...
30	23Cr-12Ni	Smls. & wld. fittings	SA-403	309	S30900	...
31	23Cr-12Ni	Smls. tube	SA-213	TP309S	S30908	...
32	23Cr-12Ni	Plate	SA-240	309S	S30908	...
33	23Cr-12Ni	Wld. tube	SA-249	TP309S	S30908	...
34	23Cr-12Ni	Smls. & wld. pipe	SA-312	TP309S	S30908	...
35	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	1
36	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	3
37	23Cr-12Ni	Wld. pipe	SA-358	309S	S30908	4
38	23Cr-12Ni	Bar	SA-479	309S	S30908	...
39	23Cr-12Ni	Wld. pipe	SA-813	TP309S	S30908	...
40	23Cr-12Ni	Wld. pipe	SA-814	TP309S	S30908	...
41	23Cr-12Ni	Bar	SA/JIS G4303	SUS309S	...	...
42	23Cr-12Ni	Smls. tube	SA-213	TP309H	S30909	...
43	23Cr-12Ni	Plate	SA-240	309H	S30909	...
44	23Cr-12Ni	Wld. tube	SA-249	TP309H	S30909	...
45	23Cr-12Ni	Smls. & wld. pipe	SA-312	TP309H	S30909	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	95	65	...
2	...	95	65	...
3	...	95	65	...
4	...	95	65	...
5	...	95	70	...
6	...	95	70	...
7	...	85	42.5	...
8	...	100	55	...
9	...	100	55	...
10	...	100	55	...
11	...	100	55	...
12	...	100	55	...
13	...	100	55	...
14	...	100	55	...
15	...	100	55	...
16	...	100	55	...
17	...	100	55	...
18	...	100	55	...
19	...	100	55	...
20	...	100	55	...
21	...	100	55	...
22	...	100	55	...
23	$3 < t \leq 8$	100	60	...
24	$2 < t \leq 3$	115	75	...
25	≤ 2	135	105	...
26	...	87	58	...
27	>1	87	58	...
28	...	87	58	...
29	≤ 1	100	65	...
30	...	75	30	...
31	...	75	30	...
32	...	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	...	75	30	...
41	...	75	30	...
42	...	75	30	...
43	...	75	30	...
44	...	75	30	...
45	...	75	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
2	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
3	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
4	65.0	60.5	57.8	55.5	53.7	...	51.2	...	49.6
5	70.0	65.1	62.2	59.8	57.9	...	55.2	...	53.4
6	70.0	65.1	62.2	59.8	57.9	...	55.2	...	53.4
7	42.5	38.4	36.4	34.8	33.4	...	31.5	...	30.0
8	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
9	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
10	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
11	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
12	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
13	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
14	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
15	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
16	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
17	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
18	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
19	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
20	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
21	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
22	55.0	49.8	47.1	45.0	43.3	...	40.7	...	38.8
23	60.0	...	51.4	...	47.2	...	44.4	...	42.4
24	75.0	...	64.2	...	59.0	...	55.5	...	53.0
25	105.0	...	89.9	...	82.6	...	77.8	...	74.2
26	58.0	52.6	49.8	47.8	46.3	...	44.5	...	43.4
27	58.0	52.6	49.8	47.8	46.3	...	44.5	...	43.4
28	58.0	52.6	49.8	47.8	46.3	...	44.5	...	43.4
29	65.0	58.9	55.9	53.6	51.9	...	49.6	...	48.6
30	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
31	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
32	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
33	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
34	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
35	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
36	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
37	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
38	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
39	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
40	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
41	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
42	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
43	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
44	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
45	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	47.9	46.9	...	...	...	...	...	...	...
2	...	47.9	46.9	...	...	...	...	...	...	...
3	...	47.9	46.9	...	...	...	...	...	...	...
4	...	47.9	46.9	...	...	...	...	...	...	...
5	...	51.6	50.5	...	...	...	...	...	...	...
6	...	51.6	50.5	...	...	...	...	...	...	...
7	...	28.9	28.4	28.0	27.6	27.3	27.0	26.7	26.4	26.0
8	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
9	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
10	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
11	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
12	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
13	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
14	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
15	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
16	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
17	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
18	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
19	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
20	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
21	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
22	...	37.4	36.8	36.3	35.8	35.3	34.9	34.5	34.1	33.7
23	...	40.8	40.1	39.5	39.0	38.5	38.1	37.7	37.2	36.7
24	...	51.0	50.2	49.4	48.8	48.2	47.6	47.1	46.6	45.9
25	...	71.4	70.3	69.2	68.3	67.5	66.7	66.0	65.2	64.2
26	...	42.1	41.3	40.4	39.4	38.6	...	...	...	...
27	...	42.1	41.3	40.4	39.4	38.6	...	...	...	...
28	...	42.1	41.3	40.4	39.4	38.6	...	...	...	...
29	...	47.2	46.3	45.3	...	...	...	...	...	...
30	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
31	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
32	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
33	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
34	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
35	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
36	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
37	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
38	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
39	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
40	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
41	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
42	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
43	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
44	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
45	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
9	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
10	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
11	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
12	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
13	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
14	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
15	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
16	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
17	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
18	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
19	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
20	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
21	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
22	32.9	32.4	31.7	30.9	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
32	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
33	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
34	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
35	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
36	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
37	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
38	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
39	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
40	17.6	17.2	16.7	16.2	15.6	15.0	14.3	13.5	12.5	11.5	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	23Cr-12Ni	Bar	SA-479	309H	S30909	...
2	23Cr-12Ni-Cb	Smls. tube	SA-213	TP309Cb	S30940	...
3	23Cr-12Ni-Cb	Plate	SA-240	309Cb	S30940	...
4	23Cr-12Ni-Cb	Wld. tube	SA-249	TP309Cb	S30940	...
5	23Cr-12Ni-Cb	Smls. & wld. pipe	SA-312	TP309Cb	S30940	...
6	23Cr-12Ni-Cb	Bar	SA-479	309Cb	S30940	...
7	23Cr-12Ni-Cb	Wld. pipe	SA-813	TP309Cb	S30940	...
8	23Cr-12Ni-Cb	Wld. pipe	SA-814	TP309Cb	S30940	...
9	23Cr-25Ni-5.5Mo-N	Forgings	SA-182	...	S32053	...
10	23Cr-25Ni-5.5Mo-N	Bolting	SA-193	...	S32053	...
11	23Cr-25Ni-5.5Mo-N	Plate	SA-240	...	S32053	...
12	23Cr-25Ni-5.5Mo-N	Wld. tube	SA-249	...	S32053	...
13	23Cr-25Ni-5.5Mo-N	Smls. & wld. pipe	SA-312	...	S32053	...
14	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-358	...	S32053	...
15	23Cr-25Ni-5.5Mo-N	Fittings	SA-403	...	S32053	...
16	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-409	...	S32053	...
17	23Cr-25Ni-5.5Mo-N	Bar	SA-479	...	S32053	...
18	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-813	...	S32053	...
19	23Cr-25Ni-5.5Mo-N	Wld. pipe	SA-814	...	S32053	...
20	24Cr-10Ni-4Mo-N	Castings	SA-995	2A	J93345	...
21	24Cr-22Ni-6Mo-2W-Cu-N	Forgings	SA-182	F58	S31266	...
22	24Cr-22Ni-6Mo-2W-Cu-N	Smls. tube	SA-213	...	S31266	...
23	24Cr-22Ni-6Mo-2W-Cu-N	Plate	SA-240	...	S31266	...
24	24Cr-22Ni-6Mo-2W-Cu-N	Wld. tube	SA-249	...	S31266	...
25	24Cr-22Ni-6Mo-2W-Cu-N	Smls. & wld. pipe	SA-312	...	S31266	...
26	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-358	...	S31266	...
27	24Cr-22Ni-6Mo-2W-Cu-N	Smls. & wld. fittings	SA-403	...	S31266	...
28	24Cr-22Ni-6Mo-2W-Cu-N	Bar, shapes	SA-479	...	S31266	...
29	24Cr-22Ni-6Mo-2W-Cu-N	Wld. pipe	SA-813	...	S31266	...
30	25Cr-4Ni-4Mo-Ti	Plate	SA-240	...	S44635	...
31	25Cr-4Ni-4Mo-Ti	Wld. tube	SA-268	...	S44635	...
32	25Cr-5Ni-3Mo-2Cu	Castings	SA-995	1B	J93372	...
33	25Cr-5Ni-3Mo-2Cu	Plate	SA-240	...	S32550	...
34	25Cr-5Ni-3Mo-2Cu	Bar	SA-479	...	S32550	...
35	25Cr-5Ni-3Mo-2Cu	Smls. & wld. tube	SA-789	...	S32550	...
36	25Cr-5Ni-3Mo-2Cu	Smls. & wld. pipe	SA-790	...	S32550	...
37	25Cr-6Ni-Mo-N	Forgings	SA-182	...	S32506	...
38	25Cr-6Ni-Mo-N	Plate, sheet	SA-240	...	S32506	...
39	25Cr-6Ni-Mo-N	Bar	SA-479	...	S32506	...
40	25Cr-6Ni-Mo-N	Smls. tube	SA-789	...	S32506	...
41	25Cr-6Ni-Mo-N	Wld. tube	SA-789	...	S32506	...
42	25Cr-6Ni-Mo-N	Smls. pipe	SA-790	...	S32506	...
43	25Cr-6Ni-Mo-N	Wld. pipe	SA-790	...	S32506	...
44	25Cr-6Ni-Mo-N	Plate	SA-240	...	S31200	...
45	25Cr-6.5Ni-3Mo-N	Smls. & wld. tube	SA-789	...	S31260	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	75	30	...
2	...	75	30	...
3	...	75	30	...
4	...	75	30	...
5	...	75	30	...
6	...	75	30	...
7	...	75	30	...
8	...	75	30	...
9	...	93	43	...
10	...	93	43	...
11	...	93	43	...
12	...	93	43	...
13	...	93	43	...
14	...	93	43	...
15	...	93	43	...
16	...	93	43	...
17	...	93	43	...
18	...	93	43	...
19	...	93	43	...
20	...	95	65	...
21	...	109	61	...
22	...	109	61	...
23	...	109	61	...
24	...	109	61	...
25	...	109	61	...
26	...	109	61	...
27	...	109	61	...
28	...	109	61	...
29	...	109	61	...
30	...	90	75	...
31	...	90	75	...
32	...	100	70	...
33	...	110	80	...
34	...	110	80	...
35	...	110	80	...
36	...	110	80	...
37	...	90	65	...
38	...	90	65	...
39	...	90	65	...
40	...	90	65	...
41	...	90	65	...
42	...	90	65	...
43	...	90	65	...
44	...	100	65	...
45	...	100	65	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
2	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
3	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
4	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
5	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
6	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
7	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
8	30.0	27.6	26.3	25.1	24.2	...	22.7	...	21.6
9	43.0	...	36.3	...	32.8	...	30.5	...	29.0
10	43.0	...	36.3	...	32.8	...	30.5	...	29.0
11	43.0	...	36.3	...	32.8	...	30.5	...	29.0
12	43.0	...	36.3	...	32.8	...	30.5	...	29.0
13	43.0	...	36.3	...	32.8	...	30.5	...	29.0
14	43.0	...	36.3	...	32.8	...	30.5	...	29.0
15	43.0	...	36.3	...	32.8	...	30.5	...	29.0
16	43.0	...	36.3	...	32.8	...	30.5	...	29.0
17	43.0	...	36.3	...	32.8	...	30.5	...	29.0
18	43.0	...	36.3	...	32.8	...	30.5	...	29.0
19	43.0	...	36.3	...	32.8	...	30.5	...	29.0
20	65.0	56.6	52.4	49.2	46.8	...	43.9	...	42.5
21	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
22	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
23	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
24	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
25	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
26	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
27	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
28	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
29	61.0	56.2	53.7	51.7	50.0	48.7	47.6	46.8	46.1
30	75.0	66.1	62.0	58.7	55.8	...	51.0	...	47.5
31	75.0	66.1	62.0	58.7	55.8	...	51.0	...	47.5
32	70.0	...	...	...	...	...	...	...	...
33	80.0	73.8	70.2	67.0	64.3	...	60.5	...	58.7
34	80.0	73.8	70.2	67.0	64.3	...	60.5	...	58.7
35	80.0	73.8	70.2	67.0	64.3	...	60.5	...	58.7
36	80.0	73.8	70.2	67.0	64.3	...	60.5	...	58.7
37	65.0	...	57.4	...	52.8	...	50.1	...	49.0
38	65.0	...	57.4	...	52.8	...	50.1	...	49.0
39	65.0	...	57.4	...	52.8	...	50.1	...	49.0
40	65.0	...	57.4	...	52.8	...	50.1	...	49.0
41	65.0	...	57.4	...	52.8	...	50.1	...	49.0
42	65.0	...	57.4	...	52.8	...	50.1	...	49.0
43	65.0	...	57.4	...	52.8	...	50.1	...	49.0
44	65.0	58.6	55.3	52.6	50.4	...	47.5	...	45.5
45	65.0	59.5	56.6	54.2	52.3	...	49.5	...	47.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Ferrous Materials (Cont'd)									
1	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
2	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
3	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
4	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
5	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
6	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
7	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
8	...	20.8	20.5	20.2	20.0	19.7	19.4	19.1	18.8	18.4
9	...	27.8	27.3	26.9	...	...	...	...	...	...
10	...	27.8	27.3	26.9	...	...	...	...	...	...
11	...	27.8	27.3	26.9	...	...	...	...	...	...
12	...	27.8	27.3	26.9	...	...	...	...	...	...
13	...	27.8	27.3	26.9	...	...	...	...	...	...
14	...	27.8	27.3	26.9	...	...	...	...	...	...
15	...	27.8	27.3	26.9	...	...	...	...	...	...
16	...	27.8	27.3	26.9	...	...	...	...	...	...
17	...	27.8	27.3	26.9	...	...	...	...	...	...
18	...	27.8	27.3	26.9	...	...	...	...	...	...
19	...	27.8	27.3	26.9	...	...	...	...	...	...
20	...	41.4	40.6	39.3	...	...	...	...	...	...
21	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
22	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
23	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
24	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
25	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
26	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
27	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
28	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
29	45.7	45.3	45.1	44.9	44.7	44.5	...	...	...	...
30	...	45.0	43.5	...	...	...	...	...	...	...
31	...	45.0	43.5	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	58.4	58.2	57.4	55.4	51.5	...	...	...	...
34	...	58.4	58.2	57.4	55.4	51.5	...	...	...	...
35	...	58.4	58.2	57.4	55.4	51.5	...	...	...	...
36	...	58.4	58.2	57.4	55.4	51.5	...	...	...	...
37	...	48.4	...	...	...	...	...	...	...	...
38	...	48.4	...	...	...	...	...	...	...	...
39	...	48.4	...	...	...	...	...	...	...	...
40	...	48.4	...	...	...	...	...	...	...	...
41	...	48.4	...	...	...	...	...	...	...	...
42	...	48.4	...	...	...	...	...	...	...	...
43	...	48.4	...	...	...	...	...	...	...	...
44	...	43.6	42.2	...	...	...	...	...	...	...
45	...	46.8	46.3	45.8	45.2	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	25Cr-6.5Ni-3Mo-N	Smls. & wld. pipe	SA-790	...	S31260	...
2	25Cr-6.5Ni-3Mo-N	Plate	SA-240	...	S31260	...
3	25Cr-7Ni-3Mo-W-Cu-N	Forgings	SA-182	F54	S39274	...
4	25Cr-7Ni-3Mo-W-Cu-N	Smls. & wld. tube	SA-789	...	S39274	...
5	25Cr-7Ni-3Mo-W-Cu-N	Smls. & wld. pipe	SA-790	...	S39274	...
6	25Cr-7Ni-4Mo-N	Forgings	SA-182	F53	S32750	...
7	25Cr-7Ni-4Mo-N	Plate	SA-240	...	S32750	...
8	25Cr-7Ni-4Mo-N	Smls. & wld. tube	SA-789	...	S32750	...
9	25Cr-7Ni-4Mo-N	Smls. & wld. pipe	SA-790	...	S32750	...
10	25Cr-7.5Ni-3.5Mo-N-Cu-W	Castings	SA-995	CD3MWCuN	J93380	...
11	25Cr-7.5Ni-3.5Mo-N-Cu-W	Forgings	SA-182	F55	S32760	...
12	25Cr-7.5Ni-3.5Mo-N-Cu-W	Plate	SA-240	...	S32760	...
13	25Cr-7.5Ni-3.5Mo-N-Cu-W	Bar	SA-479	...	S32760	Annealed
14	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. tube	SA-789	...	S32760	...
15	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. pipe	SA-790	...	S32760	...
16	25Cr-7.5Ni-3.5Mo-N-Cu-W	Smls. & wld. fittings	SA-815	...	S32760	...
17	25Cr-12Ni	Castings	SA-351	CH8	J93400	...
18	25Cr-12Ni	Cast pipe	SA-451	CPH8	J93400	...
19	25Cr-12Ni	Castings	SA-351	CH20	J93402	...
20	25Cr-12Ni	Cast pipe	SA-451	CPH20	J93402	...
21	25Cr-20Ni	Castings	SA-351	CK20	J94202	...
22	25Cr-20Ni	Cast pipe	SA-451	CPK20	J94202	...
23	25Cr-20Ni	Forgings	SA-182	F310	S31000	...
24	25Cr-20Ni	Forgings	SA-965	F310	S31000	...
(23) 25	25Cr-20Ni	Smls. tube	SA-213	...	S31002	...
(23) 26	25Cr-20Ni	Smls. pipe	SA-312	...	S31002	...
27	25Cr-20Ni	Smls. tube	SA-213	TP310S	S31008	...
28	25Cr-20Ni	Plate	SA-240	310S	S31008	...
29	25Cr-20Ni	Wld. tube	SA-249	TP310S	S31008	...
30	25Cr-20Ni	Smls. & wld. pipe	SA-312	TP310S	S31008	...
31	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	1
32	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	3
33	25Cr-20Ni	Wld. pipe	SA-358	310S	S31008	4
34	25Cr-20Ni	Smls. & wld. fittings	SA-403	310S	S31008	...
35	25Cr-20Ni	Bar	SA-479	310S	S31008	...
36	25Cr-20Ni	Wld. pipe	SA-813	TP310S	S31008	...
37	25Cr-20Ni	Wld. pipe	SA-814	TP310S	S31008	...
38	25Cr-20Ni	Bar	SA/JIS G4303	SUS310S	...	...
39	25Cr-20Ni	Smls. tube	SA-213	TP310H	S31009	...
40	25Cr-20Ni	Plate	SA-240	310H	S31009	...
41	25Cr-20Ni	Wld. tube	SA-249	TP310H	S31009	...
42	25Cr-20Ni	Smls. & wld. pipe	SA-312	TP310H	S31009	...
43	25Cr-20Ni	Bar	SA-479	310H	S31009	...
44	25Cr-20Ni-Cb	Smls. tube	SA-213	TP310Cb	S31040	...
45	25Cr-20Ni-Cb	Plate	SA-240	310Cb	S31040	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	100	65	...
2	...	100	70	...
3	...	116	80	...
4	...	116	80	...
5	...	116	80	...
6	...	116	80	...
7	...	116	80	...
8	...	116	80	...
9	...	116	80	...
10	...	100	65	...
11	...	109	80	...
12	...	109	80	...
13	...	109	80	...
14	...	109	80	...
15	...	109	80	...
16	...	109	80	...
17	...	65	28	...
18	...	65	28	...
19	...	70	30	...
20	...	70	30	...
21	...	65	28	...
22	...	65	28	...
23	≤5	75	30	...
24	...	75	30	...
25	...	73	30	...
26	...	73	30	...
27	...	75	30	...
28	...	75	30	...
29	...	75	30	...
30	...	75	30	...
31	...	75	30	...
32	...	75	30	...
33	...	75	30	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	...	75	30	...
41	...	75	30	...
42	...	75	30	...
43	...	75	30	...
44	...	75	30	...
45	...	75	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	65.0	59.5	56.6	54.2	52.3	...	49.5	...	47.9
2	70.0	64.1	61.0	58.4	56.3	...	53.3	...	51.5
3	80.0	70.6	66.9	64.2	62.1	...	59.3	...	58.2
4	80.0	70.6	66.9	64.2	62.1	...	59.3	...	58.2
5	80.0	70.6	66.9	64.2	62.1	...	59.3	...	58.2
6	80.0	74.0	70.5	67.4	64.7	...	60.7	...	58.3
7	80.0	74.0	70.5	67.4	64.7	...	60.7	...	58.3
8	80.0	74.0	70.5	67.4	64.7	...	60.7	...	58.3
9	80.0	74.0	70.5	67.4	64.7	...	60.7	...	58.3
10	65.0	57.9	54.1	52.2	50.2	49.4	48.5	48.1	47.7
11	80.0	...	64.6	...	59.9	...	58.7	...	58.2
12	80.0	...	64.6	...	59.9	...	58.7	...	58.2
13	80.0	...	64.6	...	59.9	...	58.7	...	58.2
14	80.0	...	64.6	...	59.9	...	58.7	...	58.2
15	80.0	...	64.6	...	59.9	...	58.7	...	58.2
16	80.0	...	64.6	...	59.9	...	58.7	...	58.2
17	28.0	24.4	22.9	21.8	21.1	...	20.2	...	19.6
18	28.0	24.4	22.9	21.8	21.1	...	20.2	...	19.6
19	30.0	26.1	24.5	23.4	22.6	...	21.7	...	21.0
20	30.0	26.1	24.5	23.4	22.6	...	21.7	...	21.0
21	28.0	24.4	22.9	21.8	21.1	...	20.2	...	19.6
22	28.0	24.4	22.9	21.8	21.1	...	20.2	...	19.6
23	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
24	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
25	30.0	27.9	26.8	25.9	25.0	24.3	23.6	23.0	22.3
26	30.0	27.9	26.8	25.9	25.0	24.3	23.6	23.0	22.3
27	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
28	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
29	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
30	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
31	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
32	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
33	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
34	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
35	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
36	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
37	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
38	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
39	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
40	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
41	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
42	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
43	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
44	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
45	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Ferrous Materials (Cont'd)										
1	...	46.8	46.3	45.8	45.2	...	...	...	...	...
2	...	50.4	49.9	49.4	48.7	...	...	...	...	...
3	...	58.2	58.2	58.2	58.2	...	...	...	...	...
4	...	58.2	58.2	58.2	58.2	...	...	...	...	...
5	...	58.2	58.2	58.2	58.2	...	...	...	...	...
6	...	57.2	57.0	57.0	57.0	...	...	...	...	...
7	...	57.2	57.0	57.0	57.0	...	...	...	...	...
8	...	57.2	57.0	57.0	57.0	...	...	...	...	...
9	...	57.2	57.0	57.0	57.0	...	...	...	...	...
10	47.3	47.0	...	...	...	...	...	...	...	...
11	...	56.0	...	...	...	...	...	...	...	...
12	...	56.0	...	...	...	...	...	...	...	...
13	...	56.0	...	...	...	...	...	...	...	...
14	...	56.0	...	...	...	...	...	...	...	...
15	...	56.0	...	...	...	...	...	...	...	...
16	...	56.0	...	...	...	...	...	...	...	...
17	...	19.0	18.6	18.1	17.6	17.1	16.6	16.0	15.4	14.8
18	...	19.0	18.6	18.1	17.6	17.1	16.6	16.0	15.4	14.8
19	...	20.3	19.9	19.4	18.9	18.3	17.7	17.1	16.5	15.9
20	...	20.3	19.9	19.4	18.9	18.3	17.7	17.1	16.5	15.9
21	...	19.0	18.6	18.1	17.6	17.1	16.6	16.0	15.4	14.8
22	...	19.0	18.6	18.1	17.6	17.1	16.6	16.0	15.4	14.8
23	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
24	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
25	21.7	21.1	20.5	19.9	19.3	18.8	18.5	18.3	...	...
26	21.7	21.1	20.5	19.9	19.3	18.8	18.5	18.3	...	...
27	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
28	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
29	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
30	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
31	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
32	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
33	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
34	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
35	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
36	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
37	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
38	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
39	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
40	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
41	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
42	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
43	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
44	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2
45	...	20.6	20.2	19.9	19.6	19.4	19.1	18.8	18.5	18.2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Ferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
28	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
29	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
30	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
31	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
32	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
33	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
34	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
35	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
36	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
37	17.6	17.0	16.3	15.4	14.5	13.4	12.1	10.7	9.2	7.4	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Ferrous Materials (Cont'd)						
1	25Cr-20Ni-Cb	Wld. tube	SA-249	TP310Cb	S31040	...
2	25Cr-20Ni-Cb	Smls. & wld. pipe	SA-312	TP310Cb	S31040	...
3	25Cr-20Ni-Cb	Bar	SA-479	310Cb	S31040	...
4	25Cr-20Ni-Cb	Wld. pipe	SA-813	TP310Cb	S31040	...
5	25Cr-20Ni-Cb	Wld. pipe	SA-814	TP310Cb	S31040	...
6	25Cr-20Ni-Cb-N	Smls. tube	SA-213	TP310HCbN	S31042	...
7	25Cr-22Ni-2Mo-N	Forgings	SA-182	F310MoLN	S31050	...
8	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...
9	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...
10	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...
11	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...
12	25Cr-22Ni-2Mo-N	Smls. tube	SA-213	TP310MoLN	S31050	...
13	25Cr-22Ni-2Mo-N	Plate	SA-240	310MoLN	S31050	...
14	25Cr-22Ni-2Mo-N	Wld. tube	SA-249	TP310MoLN	S31050	...
15	25Cr-22Ni-2Mo-N	Wld. pipe	SA-312	TP310MoLN	S31050	...
16	26Cr-4Ni-Mo	Plate	SA-240	329	S32900	...
17	26Cr-4Ni-Mo	Smls. & wld. tube	SA-789	...	S32900	...
18	26Cr-4Ni-Mo	Smls. & wld. pipe	SA-790	...	S32900	...
19	26Cr-4Ni-Mo-N	Plate	SA-240	...	S32950	...
20	26Cr-4Ni-Mo-N	Smls. & wld. tube	SA-789	...	S32950	...
21	26Cr-4Ni-Mo-N	Smls. & wld. pipe	SA-790	...	S32950	...
(23) 22	27Cr-7.5Ni-4.5Mo-Co-N	Smls. tube	SA-789	...	S32707	...
(23) 23	27Cr-7.5Ni-4.5Mo-Co-N	Smls. pipe	SA-790	...	S32707	...
24	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...
25	29Cr-6.5Ni-2Mo-N	Bar	SA-479	...	S32906	...
26	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...
27	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...
28	29Cr-6.5Ni-2Mo-N	Plate, sheet, strip	SA-240	...	S32906	...
29	29Cr-6.5Ni-2Mo-N	Smls. tube	SA-789	...	S32906	...
30	29Cr-6.5Ni-2Mo-N	Smls. pipe	SA-790	...	S32906	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Ferrous Materials (Cont'd)				
1	...	75	30	...
2	...	75	30	...
3	...	75	30	...
4	...	75	30	...
5	...	75	30	...
6	...	95	43	...
7	...	78	37	...
8	$0.250 < t \leq 1.250$	78	37	...
9	$t > 0.250$	78	37	...
10	$0.250 < t \leq 1.250$	78	37	...
11	$0.250 < t \leq 1.250$	78	37	...
12	≤ 0.250 , wall	84	39	...
13	$t \leq 0.250$	84	39	...
14	≤ 0.250 , wall	84	39	...
15	≤ 0.250 , wall	84	39	...
16	...	90	70	...
17	...	90	70	...
18	...	90	70	...
19	...	100	70	...
20	...	100	70	...
21	...	100	70	...
22	...	133	101	...
23	...	133	101	...
24	≥ 0.40	109	80	...
25	...	109	80	...
26	≥ 0.40	109	80	...
27	≥ 0.40	109	80	...
28	< 0.40	116	94	...
29	< 0.40	116	94	...
30	< 0.40	116	94	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Ferrous Materials (Cont'd)									
1	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
2	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
3	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
4	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
5	30.0	27.9	26.5	25.3	24.2	...	22.6	...	21.4
6	43.0	...	36.0	...	32.5	...	30.2	...	28.8
7	37.0	33.4	31.5	29.9	28.6	...	26.7	...	25.2
8	37.0	33.4	31.5	29.9	28.6	...	26.7	...	25.2
9	37.0	33.4	31.5	29.9	28.6	...	26.7	...	25.2
10	37.0	33.4	31.5	29.9	28.6	...	26.7	...	25.2
11	37.0	33.4	31.5	29.9	28.6	...	26.7	...	25.2
12	39.0	35.2	33.2	31.5	30.2	...	28.1	...	26.5
13	39.0	35.2	33.2	31.5	30.2	...	28.1	...	26.5
14	39.0	35.2	33.2	31.5	30.2	...	28.1	...	26.5
15	39.0	35.2	33.2	31.5	30.2	...	28.1	...	26.5
16	70.0	65.3	62.4	59.8	57.6	...	53.9	...	51.3
17	70.0	65.3	62.4	59.8	57.6	...	53.9	...	51.3
18	70.0	65.3	62.4	59.8	57.6	...	53.9	...	51.3
19	70.0	64.9	62.0	59.5	57.3	...	53.8	...	51.3
20	70.0	64.9	62.0	59.5	57.3	...	53.8	...	51.3
21	70.0	64.9	62.0	59.5	57.3	...	53.8	...	51.3
22	101.0	93.7	87.1	82.5	80.1	79.2	78.3	76.7	74.6
23	101.0	93.7	87.1	82.5	80.1	79.2	78.3	76.7	74.6
24	80.0	...	68.9	...	63.2	...	59.4	...	57.1
25	80.0	...	68.9	...	63.2	...	59.4	...	57.1
26	80.0	...	68.9	...	63.2	...	59.4	...	57.1
27	80.0	...	68.9	...	63.2	...	59.4	...	57.1
28	94.0	...	81.0	...	74.3	...	69.8	...	67.1
29	94.0	...	81.0	...	74.3	...	69.8	...	67.1
30	94.0	...	81.0	...	74.3	...	69.8	...	67.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Ferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)
(23)

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials						
1	...	Plate, sheet	SB-209	...	Alclad 3003	O
2	...	Plate, sheet	SB-209	...	Alclad 3003	O
3	...	Plate, sheet	SB-209	...	Alclad 3003	H112
4	...	Plate, sheet	SB-209	...	Alclad 3003	H112
5	...	Plate, sheet	SB-209	...	Alclad 3003	H112
6	...	Plate, sheet	SB-209	...	Alclad 3003	H12
7	...	Plate, sheet	SB-209	...	Alclad 3003	H12
8	...	Plate, sheet	SB-209	...	Alclad 3003	H14
9	...	Plate, sheet	SB-209	...	Alclad 3003	H14
10	...	Drawn smls. tube	SB-210	...	Alclad 3003	O
11	...	Drawn smls. tube	SB-210	...	Alclad 3003	H113
12	...	Drawn smls. tube	SB-210	...	Alclad 3003	H14
13	...	Drawn smls. tube	SB-210	...	Alclad 3003	H18
14	...	Cond. & heat exch. tubes	SB-234	...	Alclad 3003	H14
15	...	Cond. & heat exch. tubes	SB-234	...	Alclad 3003	H25
16	...	Smls. extr. tube	SB-241	...	Alclad 3003	O
17	...	Smls. extr. tube	SB-241	...	Alclad 3003	H112
18	...	Plate, sheet	SB-209	...	Alclad 3004	O
19	...	Plate, sheet	SB-209	...	Alclad 3004	O
20	...	Plate, sheet	SB-209	...	Alclad 3004	H112
21	...	Plate, sheet	SB-209	...	Alclad 3004	H112
22	...	Plate, sheet	SB-209	...	Alclad 3004	H32
23	...	Plate, sheet	SB-209	...	Alclad 3004	H32
24	...	Plate, sheet	SB-209	...	Alclad 3004	H34
25	...	Plate, sheet	SB-209	...	Alclad 3004	H34
26	...	Plate, sheet	SB-209	...	Alclad 6061	T4
27	...	Plate, sheet	SB-209	...	Alclad 6061	T451
28	...	Plate, sheet	SB-209	...	Alclad 6061	T451
29	...	Plate, sheet	SB-209	...	Alclad 6061	T6
30	...	Plate, sheet	SB-209	...	Alclad 6061	T651
31	...	Plate, sheet	SB-209	...	Alclad 6061	T651
32	...	Plate, sheet	SB-209	...	Alclad 6061	T651
33	...	Castings	SB/EN 1706	...	AC-42000-S	T6
34	...	Plate, sheet	SB-209	...	A91060	O
35	...	Plate, sheet	SB-209	...	A91060	H112
36	...	Plate, sheet	SB-209	...	A91060	H112
37	...	Plate, sheet	SB-209	...	A91060	H112
38	...	Plate, sheet	SB-209	...	A91060	H12
39	...	Plate, sheet	SB-209	...	A91060	H14
40	...	Drawn smls. tube	SB-210	...	A91060	O
41	...	Drawn smls. tube	SB-210	...	A91060	H14
42	...	Drawn smls. tube	SB-210	...	A91060	H113
43	...	Bar, rod, shapes	SB-221	...	A91060	O
44	...	Bar, rod, shapes	SB-221	...	A91060	H112
45	...	Cond. & heat exch. tubes	SB-234	...	A91060	H14

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials				
1	0.006–0.499	13	4.5	...
2	0.500–3.000	14	5	...
3	0.250–0.499	16	9	...
4	0.500–2.000	15	6	...
5	2.001–3.000	14.5	6	...
6	0.017–0.499	16	11	...
7	0.500–2.000	17	12	...
8	0.009–0.499	19	16	...
9	0.500–1.000	20	17	...
10	0.010–0.500	13	4.5	...
11	0.050–0.500	13	4.5	...
12	0.010–0.500	19	16	...
13	0.010–0.500	26	23	...
14	0.010–0.200	19	16	...
15	0.010–0.200	21	18	...
16	...	13	4.5	...
17	...	13	4.5	...
18	0.006–0.499	21	8	...
19	0.500–3.000	22	8.5	...
20	0.250–0.499	22	8.5	...
21	0.500–3.000	23	9	...
22	0.017–0.499	27	20	...
23	0.500–2.000	28	21	...
24	0.009–0.499	31	24	...
25	0.500–1.000	32	25	...
26	0.010–0.249	27	14	...
27	0.250–0.499	27	14	...
28	0.500–3.000	30	16	...
29	0.010–0.249	38	32	...
30	0.250–0.499	38	32	...
31	0.500–4.000	42	35	...
32	4.001–5.000	40	35	...
33	...	32	26	...
34	0.006–3.000	8	2.5	...
35	0.250–0.499	11	7	...
36	0.500–1.000	10	5	...
37	1.001–3.000	9	4	...
38	0.017–2.000	11	9	...
39	0.009–1.000	12	10	...
40	0.018–0.500	8.5	2.5	...
41	0.018–0.500	12	10	...
42	0.018–0.500	8.5	2.5	...
43	...	8.5	2.5	...
44	...	8.5	2.5	...
45	0.010–0.200	12	10	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
	Nonferrous Materials								
1	4.5	4.3	4.2	4.0	3.8	3.5	3.2	...	...
2	5.0	4.8	4.7	4.5	4.2	3.9	3.6	...	...
3	9.0	8.7	8.4	8.0	7.5	7.0	6.5	...	...
4	6.0	5.8	5.6	5.4	5.0	4.7	4.3	...	...
5	6.0	5.8	5.6	5.4	5.0	4.7	4.3	...	...
6	11.0	10.9	10.3	9.1	7.9	6.8	5.4	...	...
7	12.0	11.9	11.2	9.9	8.6	7.4	5.9	...	...
8	16.0	15.4	14.5	13.1	11.3	9.2	7.2	...	...
9	17.0	16.4	15.4	13.9	12.0	9.8	7.6	...	...
10	4.5	4.3	4.2	4.0	3.8	3.5	3.2	...	...
11	4.5	4.3	4.2	4.0	3.8	3.5	3.2	...	...
12	16.0	15.4	14.5	13.1	11.3	9.2	7.2	...	...
13	23.0	20.6	18.3	16.0	13.4	10.4	7.5	...	...
14	16.0	15.4	14.5	13.1	11.3	9.2	7.2	...	...
15	18.0	17.0	15.6	13.9	11.9	9.6	7.3	...	...
16	4.5	4.3	4.2	4.0	3.8	3.5	3.2	...	...
17	4.5	4.3	4.2	4.0	3.8	3.5	3.2	...	...
18	8.0	8.0	8.0	8.0	8.0	8.0	7.6	...	...
19	8.5	8.5	8.5	8.5	8.5	8.5	8.1	...	...
20	8.5	8.5	8.5	8.5	8.5	8.5	8.1	...	...
21	9.0	9.0	9.0	9.0	9.0	8.9	8.5	...	...
22	20.0	20.0	20.0	19.7	18.5	16.1	12.2	...	...
23	21.0	21.0	21.0	20.7	19.4	16.9	12.8	...	...
24	24.0	24.0	24.0	23.5	21.1	16.6	12.3	...	...
25	25.0	25.0	25.0	24.5	22.0	17.3	12.8	...	...
26	14.0	13.7	13.6	13.3	13.3	13.3	10.2	...	...
27	14.0	13.7	13.6	13.3	13.3	13.3	10.2	...	...
28	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
29	32.0	31.5	31.3	29.8	25.3	18.2	12.2	...	...
30	32.0	31.5	31.3	29.8	25.3	18.2	12.2	...	...
31	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
32	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
33	26.2	25.8	24.4	24.4	...	...	...	...	...
34	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
35	7.0	7.0	6.8	6.0	5.3	4.9	4.6	...	...
36	5.0	5.0	4.8	4.4	3.8	3.5	3.2	...	...
37	4.0	4.0	3.8	3.5	3.0	2.8	2.6	...	...
38	9.0	8.3	7.7	7.0	6.2	5.4	4.3	...	...
39	10.0	9.6	9.3	8.6	7.5	6.2	4.5	...	...
40	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
41	10.0	9.6	9.3	8.6	7.5	6.2	4.5	...	...
42	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
43	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
44	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
45	10.0	9.6	9.3	8.6	7.5	6.2	4.5	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Nonferrous Materials												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Smls. extr. tube	SB-241	...	A91060	O
2	...	Smls. extr. tube	SB-241	...	A91060	H112
3	...	Plate, sheet	SB-209	...	A91100	O
4	...	Plate, sheet	SB-209	...	A91100	H112
5	...	Plate, sheet	SB-209	...	A91100	H112
6	...	Plate, sheet	SB-209	...	A91100	H112
7	...	Plate, sheet	SB-209	...	A91100	H12
8	...	Plate, sheet	SB-209	...	A91100	H14
9	...	Bar, rod, shapes	SB-221	...	A91100	O
10	...	Bar, rod, shapes	SB-221	...	A91100	H112
11	...	Smls. extr. tube	SB-241	...	A91100	O
12	...	Smls. extr. tube	SB-241	...	A91100	H112
13	...	Plate, sheet	SB-209	...	A93003	O
14	...	Plate, sheet	SB-209	...	A93003	H112
15	...	Plate, sheet	SB-209	...	A93003	H112
16	...	Plate, sheet	SB-209	...	A93003	H112
17	...	Plate, sheet	SB-209	...	A93003	H12
18	...	Plate, sheet	SB-209	...	A93003	H14
19	...	Drawn smls. tube	SB-210	...	A93003	O
20	...	Drawn smls. tube	SB-210	...	A93003	H113
21	...	Drawn smls. tube	SB-210	...	A93003	H12
22	...	Drawn smls. tube	SB-210	...	A93003	H14
23	...	Drawn smls. tube	SB-210	...	A93003	H18
24	...	Bar, rod, shapes	SB-221	...	A93003	O
25	...	Bar, rod, shapes	SB-221	...	A93003	H112
26	...	Cond. & heat exch. tubes	SB-234	...	A93003	H14
27	...	Cond. & heat exch. tubes	SB-234	...	A93003	H25
28	...	Smls. extr. tube	SB-241	...	A93003	O
29	...	Smls. extr. tube	SB-241	...	A93003	H112
30	...	Smls. pipe	SB-241	...	A93003	H112
31	...	Smls. pipe	SB-241	...	A93003	H18
32	...	Die forgings	SB-247	...	A93003	H112
33	...	Plate, sheet	SB-209	...	A93004	O
34	...	Plate, sheet	SB-209	...	A93004	H112
35	...	Plate, sheet	SB-209	...	A93004	H32
36	...	Plate, sheet	SB-209	...	A93004	H34
37	...	Plate, sheet	SB-209	...	A95052	O
38	...	Plate, sheet	SB-209	...	A95052	H112
39	...	Plate, sheet	SB-209	...	A95052	H112
40	...	Plate, sheet	SB-209	...	A95052	H32
41	...	Plate, sheet	SB-209	...	A95052	H34
42	...	Drawn smls. tube	SB-210	...	A95052	O
43	...	Drawn smls. tube	SB-210	...	A95052	H32
44	...	Drawn smls. tube	SB-210	...	A95052	H34
45	...	Cond. & heat exch. tubes	SB-234	...	A95052	H32

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	8.5	2.5	...
2	...	8.5	2.5	...
3	0.006-3.000	11	3.5	...
4	0.250-0.499	13	7	...
5	0.500-2.000	12	5	...
6	2.001-3.000	11.5	4	...
7	0.017-2.000	14	11	...
8	0.009-1.000	16	14	...
9	...	11	3	...
10	...	11	3	...
11	...	11	3	...
12	...	11	3	...
13	0.006-3.000	14	5	...
14	0.250-0.499	17	10	...
15	0.500-2.000	15	6	...
16	2.001-3.000	14.5	6	...
17	0.017-2.000	17	12	...
18	0.009-1.000	20	17	...
19	0.010-0.500	14	5	...
20	0.010-0.500	14	5	...
21	0.010-0.500	17	12	...
22	0.010-0.500	20	17	...
23	0.010-0.500	27	24	...
24	...	14	5	...
25	...	14	5	...
26	0.010-0.200	20	17	...
27	0.010-0.200	22	19	...
28	...	14	5	...
29	...	14	5	...
30	≥1.000	14	5	...
31	<1.000	27	24	...
32	≤4.000	14	5	...
33	0.006-3.000	22	8.5	...
34	0.250-3.000	23	9	...
35	0.017-2.000	28	21	...
36	0.009-1.000	32	25	...
37	0.006-3.000	25	9.5	...
38	0.250-0.499	28	16	...
39	0.500-3.000	25	9.5	...
40	0.017-2.000	31	23	...
41	0.009-1.000	34	26	...
42	0.010-0.450	25	10	...
43	0.010-0.450	31	23	...
44	0.010-0.450	34	26	...
45	0.010-0.200	31	23	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
	Nonferrous Materials (Cont'd)								
1	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
2	2.5	2.5	2.4	2.2	1.9	1.8	1.6	...	...
3	3.5	3.5	3.5	3.4	3.2	2.8	2.4	...	...
4	7.0	7.0	7.0	6.8	6.3	5.6	4.8	...	...
5	5.0	5.0	5.0	4.9	4.6	4.0	3.4	...	...
6	4.0	4.0	4.0	3.9	3.6	3.2	2.7	...	...
7	11.0	10.7	10.2	9.4	8.2	6.9	5.5	...	...
8	14.0	13.5	12.7	11.4	9.9	8.0	6.1	...	...
9	3.0	3.0	3.0	2.9	2.7	2.4	2.1	...	...
10	3.0	3.0	3.0	2.9	2.7	2.4	2.1	...	...
11	3.0	3.0	3.0	2.9	2.7	2.4	2.1	...	...
12	3.0	3.0	3.0	2.9	2.7	2.4	2.1	...	...
13	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
14	10.0	9.7	9.4	8.9	8.4	7.8	7.2	...	...
15	6.0	5.8	5.6	5.4	5.0	4.7	4.3	...	...
16	6.0	5.8	5.6	5.4	5.0	4.7	4.3	...	...
17	12.0	11.9	11.2	9.9	8.6	7.4	5.9	...	...
18	17.0	16.4	15.4	13.9	12.0	9.8	7.6	...	...
19	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
20	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
21	12.0	11.9	11.2	9.9	8.6	7.4	5.9	...	...
22	17.0	16.4	15.4	13.9	12.0	9.8	7.6	...	...
23	24.0	21.5	19.1	16.6	14.0	10.8	7.8	...	...
24	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
25	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
26	17.0	16.4	15.4	13.9	12.0	9.8	7.6	...	...
27	19.0	17.9	16.5	14.7	12.6	10.1	7.7	...	...
28	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
29	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
30	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
31	24.0	21.5	19.1	16.6	14.0	10.8	7.8	...	...
32	5.0	5.0	5.0	4.9	4.6	4.3	3.7	...	...
33	8.5	8.5	8.5	8.5	8.5	8.5	8.1	...	...
34	9.0	9.0	9.0	9.0	9.0	8.9	8.5	...	...
35	21.0	21.0	21.0	20.7	19.4	16.9	12.8	...	...
36	25.0	25.0	25.0	24.5	22.0	17.3	12.8	...	...
37	9.5	9.5	9.5	9.5	9.5	9.4	8.6	...	...
38	16.0	16.0	16.0	16.0	16.0	15.8	14.5	...	...
39	9.5	9.5	9.5	9.5	9.5	9.4	8.6	...	...
40	23.0	23.0	22.8	22.0	20.0	16.6	12.2	...	...
41	26.0	26.0	25.8	25.1	22.5	17.6	12.2	...	...
42	10.0	10.0	10.0	10.0	10.0	9.9	9.1	...	...
43	23.0	23.0	22.8	22.0	20.0	16.6	12.2	...	...
44	26.0	26.0	25.8	25.1	22.5	17.6	12.2	...	...
45	23.0	23.0	22.8	22.0	20.0	16.6	12.2	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Cond. & heat exch. tubes	SB-234	...	A95052	H34
2	...	Smls. extr. tube	SB-241	...	A95052	O
3	...	Plate, sheet	SB-209	...	A95083	O
4	...	Plate, sheet	SB-209	...	A95083	O
5	...	Plate, sheet	SB-209	...	A95083	O
6	...	Plate, sheet	SB-209	...	A95083	O
7	...	Plate, sheet	SB-209	...	A95083	O
8	...	Plate, sheet	SB-209	...	A95083	H112
9	...	Plate, sheet	SB-209	...	A95083	H112
10	...	Plate, sheet	SB-209	...	A95083	H32
11	...	Plate, sheet	SB-209	...	A95083	H32
12	...	Bar, rod, shapes	SB-221	...	A95083	O
13	...	Bar, rod, shapes	SB-221	...	A95083	H111
14	...	Bar, rod, shapes	SB-221	...	A95083	H112
15	...	Smls. extr. tube	SB-241	...	A95083	O
16	...	Smls. extr. tube	SB-241	...	A95083	H111
17	...	Smls. extr. tube	SB-241	...	A95083	H112
18	...	Die & hand forgings	SB-247	...	A95083	H111
19	...	Die & hand forgings	SB-247	...	A95083	H112
20	...	Plate, sheet	SB-928	...	A95083	H321
21	...	Plate, sheet	SB-928	...	A95083	H321
22	...	Plate, sheet	SB-209	...	A95086	O
23	...	Plate, sheet	SB-209	...	A95086	H112
24	...	Plate, sheet	SB-209	...	A95086	H112
25	...	Plate, sheet	SB-209	...	A95086	H112
26	...	Plate, sheet	SB-209	...	A95086	H112
27	...	Plate, sheet	SB-209	...	A95086	H32
28	...	Plate, sheet	SB-209	...	A95086	H34
29	...	Bar, rod, shapes	SB-221	...	A95086	H112
30	...	Smls. extr. tube	SB-241	...	A95086	O
31	...	Smls. extr. tube	SB-241	...	A95086	H111
32	...	Smls. extr. tube	SB-241	...	A95086	H112
33	...	Plate, sheet	SB-928	...	A95086	H116
34	...	Plate, sheet	SB-209	...	A95154	O
35	...	Plate, sheet	SB-209	...	A95154	H112
36	...	Plate, sheet	SB-209	...	A95154	H112
37	...	Plate, sheet	SB-209	...	A95154	H32
38	...	Plate, sheet	SB-209	...	A95154	H34
39	...	Drawn smls. tube	SB-210	...	A95154	O
40	...	Drawn smls. tube	SB-210	...	A95154	H34
41	...	Bar, rod, shapes	SB-221	...	A95154	O
42	...	Bar, rod, shapes	SB-221	...	A95154	H112
43	...	Plate, sheet	SB-209	...	A95254	O
44	...	Plate, sheet	SB-209	...	A95254	H112
45	...	Plate, sheet	SB-209	...	A95254	H112

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	0.010–0.200	34	26	...
2	...	25	10	...
3	0.051–1.500	40	18	...
4	1.501–3.000	39	17	...
5	3.001–5.000	38	16	...
6	5.001–7.000	37	15	...
7	7.001–8.000	36	14	...
8	0.250–1.500	40	18	...
9	1.501–3.000	39	17	...
10	0.125–1.500	44	31	...
11	1.501–3.000	41	29	...
12	≤5.000	39	16	...
13	≤5.000	40	24	...
14	≤5.000	39	16	...
15	...	39	16	...
16	...	40	24	...
17	...	39	16	...
18	≤4.000	39	20	...
19	≤4.000	39	16	...
20	0.125–1.500	44	31	...
21	1.501–3.000	41	29	...
22	0.020–2.000	35	14	...
23	0.188–0.499	36	18	...
24	0.500–1.000	35	16	...
25	1.001–2.000	35	14	...
26	2.001–3.000	34	14	...
27	0.020–2.000	40	28	...
28	0.009–1.000	44	34	...
29	≤5.000	35	14	...
30	...	35	14	...
31	...	36	21	...
32	...	35	14	...
33	0.063–2.000	40	28	...
34	0.020–3.000	30	11	...
35	0.250–0.499	32	18	...
36	0.500–3.000	30	11	...
37	0.020–2.000	36	26	...
38	0.009–1.000	39	29	...
39	0.010–0.450	30	11	...
40	0.010–0.450	39	29	...
41	...	30	11	...
42	...	30	11	...
43	0.051–3.000	30	11	...
44	0.250–0.499	32	18	...
45	0.500–3.000	30	11	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	100	150	200	250	300	350	400	450	500
	Nonferrous Materials (Cont'd)								
1	26.0	26.0	25.8	25.1	22.5	17.6	12.2	...	...
2	10.0	10.0	10.0	10.0	10.0	9.9	9.1	...	...
3	18.0	18.0	...	...	...	...	...	...	...
4	17.0	17.0	...	...	...	...	...	...	...
5	16.0	16.0	...	...	...	...	...	...	...
6	15.0	15.0	...	...	...	...	...	...	...
7	14.0	14.0	...	...	...	...	...	...	...
8	18.0	18.0	...	...	...	...	...	...	...
9	17.0	17.0	...	...	...	...	...	...	...
10	31.0	31.0	...	...	...	...	...	...	...
11	29.0	29.0	...	...	...	...	...	...	...
12	16.0	16.0	...	...	...	...	...	...	...
13	24.0	24.0	...	...	...	...	...	...	...
14	16.0	16.0	...	...	...	...	...	...	...
15	16.0	16.0	...	...	...	...	...	...	...
16	24.0	24.0	...	...	...	...	...	...	...
17	16.0	16.0	...	...	...	...	...	...	...
18	20.0	20.0	...	...	...	...	...	...	...
19	16.0	16.0	...	...	...	...	...	...	...
20	31.0	31.0	...	...	...	...	...	...	...
21	29.0	29.0	...	...	...	...	...	...	...
22	14.0	14.0	...	...	...	...	...	...	...
23	18.0	18.0	...	...	...	...	...	...	...
24	16.0	16.0	...	...	...	...	...	...	...
25	14.0	14.0	...	...	...	...	...	...	...
26	14.0	14.0	...	...	...	...	...	...	...
27	28.0	28.0	...	...	...	...	...	...	...
28	34.0	34.0	...	...	...	...	...	...	...
29	14.0	14.0	...	...	...	...	...	...	...
30	14.0	14.0	...	...	...	...	...	...	...
31	21.0	21.0	...	...	...	...	...	...	...
32	14.0	14.0	...	...	...	...	...	...	...
33	28.0	28.0	...	...	...	...	...	...	...
34	11.0	11.0	...	...	...	...	...	...	...
35	18.0	18.0	...	...	...	...	...	...	...
36	11.0	11.0	...	...	...	...	...	...	...
37	26.0	26.0	...	...	...	...	...	...	...
38	29.0	29.0	...	...	...	...	...	...	...
39	11.0	11.0	...	...	...	...	...	...	...
40	29.0	29.0	...	...	...	...	...	...	...
41	11.0	11.0	...	...	...	...	...	...	...
42	11.0	11.0	...	...	...	...	...	...	...
43	11.0	11.0	...	...	...	...	...	...	...
44	18.0	18.0	...	...	...	...	...	...	...
45	11.0	11.0	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Plate, sheet	SB-209	...	A95254	H32
2	...	Plate, sheet	SB-209	...	A95254	H34
3	...	Plate, sheet	SB-209	...	A95454	O
4	...	Plate, sheet	SB-209	...	A95454	H112
5	...	Plate, sheet	SB-209	...	A95454	H112
6	...	Plate, sheet	SB-209	...	A95454	H32
7	...	Plate, sheet	SB-209	...	A95454	H34
8	...	Bar, rod, shapes	SB-221	...	A95454	O
9	...	Bar, rod, shapes	SB-221	...	A95454	H111
10	...	Bar, rod, shapes	SB-221	...	A95454	H112
11	...	Cond. & heat exch. tubes	SB-234	...	A95454	H32
12	...	Cond. & heat exch. tubes	SB-234	...	A95454	H34
13	...	Smls. extr. tube	SB-241	...	A95454	O
14	...	Smls. extr. tube	SB-241	...	A95454	H111
15	...	Smls. extr. tube	SB-241	...	A95454	H112
16	...	Plate, sheet	SB-209	...	A95456	O
17	...	Plate, sheet	SB-209	...	A95456	O
18	...	Plate, sheet	SB-209	...	A95456	O
19	...	Plate, sheet	SB-209	...	A95456	O
20	...	Plate, sheet	SB-209	...	A95456	O
21	...	Plate, sheet	SB-209	...	A95456	H112
22	...	Plate, sheet	SB-209	...	A95456	H112
23	...	Plate, sheet	SB-209	...	A95456	H32
24	...	Plate, sheet	SB-209	...	A95456	H32
25	...	Plate, sheet	SB-209	...	A95456	H32
26	...	Bar, rod, shapes	SB-221	...	A95456	O
27	...	Bar, rod, shapes	SB-221	...	A95456	H111
28	...	Bar, rod, shapes	SB-221	...	A95456	H112
29	...	Smls. extr. tube	SB-241	...	A95456	O
30	...	Smls. extr. tube	SB-241	...	A95456	H111
31	...	Smls. extr. tube	SB-241	...	A95456	H112
32	...	Plate, sheet	SB-928	...	A95456	H321
33	...	Plate, sheet	SB-928	...	A95456	H321
34	...	Plate, sheet	SB-928	...	A95456	H321
35	...	Plate, sheet	SB-209	...	A96061	T4
36	...	Plate, sheet	SB-209	...	A96061	T451
37	...	Plate, sheet	SB-209	...	A96061	T6
38	...	Plate, sheet	SB-209	...	A96061	T651
39	...	Plate, sheet	SB-209	...	A96061	T651
40	...	Drawn smls. tube	SB-210	...	A96061	T4
41	...	Drawn smls. tube	SB-210	...	A96061	T6
42	...	Bar, rod, wire	SB-211	...	A96061	T6
43	...	Bar, rod, wire	SB-211	...	A96061	T651
44	...	Bar, rod, shapes	SB-221	...	A96061	T4
45	...	Bar, rod, shapes	SB-221	...	A96061	T6

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	0.051–2.000	36	26	...
2	0.051–1.000	39	29	...
3	0.020–3.000	31	12	...
4	0.250–0.499	32	18	...
5	0.500–3.000	31	12	...
6	0.020–2.000	36	26	...
7	0.020–1.000	39	29	...
8	≤5.000	31	12	...
9	≤5.000	33	19	...
10	≤5.000	31	12	...
11	0.010–0.200	36	26	...
12	0.010–0.200	39	29	...
13	...	31	12	...
14	...	33	19	...
15	...	31	12	...
16	0.051–1.500	42	19	...
17	1.501–3.000	41	18	...
18	3.001–5.000	40	17	...
19	5.001–7.000	39	16	...
20	7.001–8.000	38	15	...
21	0.250–1.500	42	19	...
22	1.501–3.000	41	18	...
23	0.188–0.499	46	33	...
24	0.500–1.500	44	31	...
25	1.501–3.000	41	29	...
26	≤5.000	41	19	...
27	≤5.000	42	26	...
28	≤5.000	41	19	...
29	...	41	19	...
30	...	42	26	...
31	...	41	19	...
32	0.188–0.499	46	33	...
33	0.500–1.500	44	31	...
34	1.501–3.000	41	29	...
35	0.006–0.249	30	16	...
36	0.250–3.000	30	16	...
37	0.006–0.249	42	35	...
38	0.250–4.000	42	35	...
39	4.001–6.000	40	35	...
40	0.025–0.500	30	16	...
41	0.025–0.500	42	35	...
42	$\frac{1}{8} < t \leq 8$	42	35	...
43	$\frac{1}{8} < t \leq 8$	42	35	...
44	...	26	16	...
45	...	38	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	26.0	26.0	...	...	...	...	...	...	...
2	29.0	29.0	...	...	...	...	...	...	...
3	12.0	12.0	12.0	12.0	11.9	11.5	10.6	...	...
4	18.0	18.0	18.0	18.0	17.8	17.2	15.9	...	...
5	12.0	12.0	12.0	12.0	11.9	11.5	10.6	...	...
6	26.0	25.9	25.7	25.0	23.7	21.4	18.1	...	...
7	29.0	28.6	27.5	25.9	23.9	21.4	18.1	...	...
8	12.0	12.0	12.0	12.0	11.9	11.5	10.6	...	...
9	19.0	19.0	19.0	19.0	18.8	18.2	16.8	...	...
10	12.0	12.0	12.0	12.0	11.9	11.5	10.6	...	...
11	26.0	25.9	25.7	25.0	23.7	21.4	18.1	...	...
12	29.0	28.6	27.5	25.9	23.9	21.4	18.1	...	...
13	12.0	12.0	12.0	12.0	11.9	11.5	10.6	...	...
14	19.0	19.0	19.0	19.0	18.8	18.2	16.8	...	...
15	12.0	12.0	12.0	12.0	11.9	11.5	10.6	...	...
16	19.0	19.0	...	...	...	...	...	...	...
17	18.0	18.0	...	...	...	...	...	...	...
18	17.0	17.0	...	...	...	...	...	...	...
19	16.0	16.0	...	...	...	...	...	...	...
20	15.0	15.0	...	...	...	...	...	...	...
21	19.0	19.0	...	...	...	...	...	...	...
22	18.0	18.0	...	...	...	...	...	...	...
23	33.0	33.0	...	...	...	...	...	...	...
24	31.0	31.0	...	...	...	...	...	...	...
25	29.0	29.0	...	...	...	...	...	...	...
26	19.0	19.0	...	...	...	...	...	...	...
27	26.0	26.0	...	...	...	...	...	...	...
28	19.0	19.0	...	...	...	...	...	...	...
29	19.0	19.0	...	...	...	...	...	...	...
30	26.0	26.0	...	...	...	...	...	...	...
31	19.0	19.0	...	...	...	...	...	...	...
32	33.0	33.0	...	...	...	...	...	...	...
33	31.0	31.0	...	...	...	...	...	...	...
34	29.0	29.0	...	...	...	...	...	...	...
35	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
36	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
37	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
38	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
39	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
40	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
41	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
42	35.0	34.6	33.7	32.4	27.4	20.0	13.3	...	...
43	35.0	34.6	33.7	32.4	27.4	20.0	13.3	...	...
44	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
45	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Cond. & heat exch. tubes	SB-234	...	A96061	T4
2	...	Cond. & heat exch. tubes	SB-234	...	A96061	T6
3	...	Smls. extr. tube	SB-241	...	A96061	T4
4	...	Smls. extr. tube	SB-241	...	A96061	T6
5	...	Smls. pipe	SB-241	...	A96061	T6 drawn
6	...	Smls. pipe	SB-241	...	A96061	T6
7	...	Die forgings	SB-247	...	A96061	T6
8	...	Hand forgings	SB-247	...	A96061	T6
9	...	Hand forgings	SB-247	...	A96061	T6
10	...	Shapes	SB-308	...	A96061	T6
11	...	Drawn smls. tube	SB-210	...	A96063	T6
12	...	Bar, rod, shapes	SB-221	...	A96063	T1
13	...	Bar, rod, shapes	SB-221	...	A96063	T1
14	...	Bar, rod, shapes	SB-221	...	A96063	T5
15	...	Bar, rod, shapes	SB-221	...	A96063	T5
16	...	Bar, rod, shapes	SB-221	...	A96063	T6
17	...	Smls. extr. tube	SB-241	...	A96063	O
18	...	Smls. extr. tube	SB-241	...	A96063	T1
19	...	Smls. extr. tube	SB-241	...	A96063	T1
20	...	Smls. extr. tube	SB-241	...	A96063	T5
21	...	Smls. extr. tube	SB-241	...	A96063	T5
22	...	Smls. extr. tube	SB-241	...	A96063	T6
23	...	Smls. pipe	SB-241	...	A96063	O
(23) 24	...	Castings	SB/EN 1706	AlSi7Mg	AC-42000	...
(23) 25	...	Castings	SB/EN 1706	...	AC-44300	F
(23) 26	...	Bar, rod	SB-187	...	C10200	O60
27	...	Smls. pipe	SB-42	...	C10200	O61
28	...	Smls. tube	SB-75	...	C10200	O60
29	...	Plate, sheet, strip	SB-152	...	C10200	H00
30	...	Plate, sheet, strip	SB-152	...	C10200	H01
31	...	Plate, sheet, strip	SB-152	...	C10200	H02
32	...	Plate, sheet, strip	SB-152	...	C10200	H03
33	...	Plate, sheet, strip	SB-152	...	C10200	H04
34	...	Plate, sheet, strip	SB-152	...	C10200	M20, O25
35	...	Smls. pipe	SB-42	...	C10200	H55
36	...	Smls. tube	SB-75	...	C10200	H55
37	...	Smls. cond. tube	SB-111	...	C10200	H55
38	...	Smls. U-bend tube	SB-395	...	C10200	H55
39	...	Smls. pipe	SB-42	...	C10200	H80
40	...	Smls. tube	SB-75	...	C10200	H80
41	...	Smls. cond. tube	SB-111	...	C10200	H80
42	...	Plate, sheet, strip	SB-152	...	C10400	H00
43	...	Plate, sheet, strip	SB-152	...	C10400	H01
44	...	Plate, sheet, strip	SB-152	...	C10400	H02
45	...	Plate, sheet, strip	SB-152	...	C10400	H03

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	0.025–0.200	30	16	...
2	0.025–0.200	42	35	...
3	...	26	16	...
4	...	38	35	...
5	<1.000	42	35	...
6	≥1.000	38	35	...
7	≤4.000	38	35	...
8	≤4.000	37	33	...
9	4.001–8.000	35	32	...
10	...	38	35	...
11	0.025–0.500	33	28	...
12	≤0.500	17	9	...
13	0.501–1.000	16	8	...
14	≤0.500	22	16	...
15	0.501–1.000	21	15	...
16	≤1.000	30	25	...
17	...	16	5	...
18	≤0.500	17	9	...
19	0.501–1.000	16	8	...
20	≤0.500	22	16	...
21	0.501–1.000	21	15	...
22	≤1.000	30	25	...
23	...	16	5	...
24	...	20	12	...
25	...	35	19	...
26	All	28	8	...
27	All	30	9	...
28	All	30	9	...
29	...	30	10	...
30	...	30	10	...
31	...	30	10	...
32	...	30	10	...
33	...	30	10	...
34	...	30	10	...
35	2 < NPS ≤ 12	36	30	...
36	All	36	30	...
37	...	36	30	...
38	...	36	30	...
39	1/8 < NPS ≤ 2	45	40	...
40	<4	45	40	...
41	...	45	40	...
42	...	30	10	...
43	...	30	10	...
44	...	30	10	...
45	...	30	10	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
2	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
3	16.0	15.7	15.5	15.2	15.2	15.2	11.6	...	...
4	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
5	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
6	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
7	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
8	33.0	32.5	32.2	30.6	26.1	18.7	12.6	...	...
9	32.0	31.4	31.1	30.5	30.5	30.5	23.2	...	...
10	35.0	34.4	34.2	32.5	27.7	19.9	13.3	...	...
11	28.0	26.9	26.4	24.2	18.4	9.8	5.7	...	...
12	9.0	9.0	9.0	8.9	8.9	8.9	5.1	...	...
13	8.0	8.0	8.0	7.9	7.9	7.9	5.1	...	...
14	16.0	15.5	15.1	15.0	13.2	8.9	5.1	...	...
15	15.0	14.5	14.2	14.0	12.5	8.9	5.1	...	...
16	25.0	24.1	23.5	21.5	16.3	8.7	5.1	...	...
17	5.0	4.9	4.8	4.5	4.2	3.7	...	...	...
18	9.0	9.0	9.0	8.9	8.9	8.9	...	...	...
19	8.0	8.0	8.0	7.9	7.9	7.9	...	...	...
20	16.0	15.5	15.1	15.0	13.2	8.9	5.1	...	...
21	15.0	14.5	14.2	14.0	12.5	8.9	5.1	...	...
22	25.0	24.0	23.5	21.6	16.4	8.7	5.1	...	...
23	5.0	4.9	4.8	4.5	4.2	3.7	...	...	...
24	11.6	11.6	11.6	11.6	11.6	11.6	...	...	...
25	18.9	15.5	13.2	12.5	12.5	...	...	...	...
26	8.0	7.0	7.0	7.0	7.0	6.8	6.5	6.1	...
27	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
28	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
29	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
30	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
31	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
32	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
33	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
34	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
35	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
36	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
37	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
38	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
39	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
40	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
41	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
42	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
43	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
44	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
45	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Plate, sheet, strip	SB-152	...	C10400	H04
2	...	Plate, sheet, strip	SB-152	...	C10400	M20, O25
3	...	Plate, sheet, strip	SB-152	...	C10500	H00
4	...	Plate, sheet, strip	SB-152	...	C10500	H01
5	...	Plate, sheet, strip	SB-152	...	C10500	H02
6	...	Plate, sheet, strip	SB-152	...	C10500	H03
7	...	Plate, sheet, strip	SB-152	...	C10500	H04
8	...	Plate, sheet, strip	SB-152	...	C10500	M20, O25
9	...	Plate, sheet, strip	SB-152	...	C10700	H00
10	...	Plate, sheet, strip	SB-152	...	C10700	H01
11	...	Plate, sheet, strip	SB-152	...	C10700	H02
12	...	Plate, sheet, strip	SB-152	...	C10700	H03
13	...	Plate, sheet, strip	SB-152	...	C10700	H04
14	...	Plate, sheet, strip	SB-152	...	C10700	M20, O25
(23) 15	...	Bar	SB-187	...	C11000	H04
16	...	Bar, rod	SB-187	...	C11000	O60
17	...	Plate, sheet, strip, bar	SB-152	...	C11000	M20, O25
18	...	Smls. tube	SB-75	...	C12000	O50
19	...	Smls. tube	SB-75	...	C12000	O60
20	...	Smls. pipe	SB-42	...	C12000	O61
21	...	Smls. pipe	SB-42	...	C12000	H55
22	...	Smls. tube	SB-75	...	C12000	H55
23	...	Smls. cond. tube	SB-111	...	C12000	H55
24	...	Smls. U-bend tube	SB-395	...	C12000	H55
25	...	Smls. pipe	SB-42	...	C12000	H80
26	...	Smls. tube	SB-75	...	C12000	H80
27	...	Smls. cond. tube	SB-111	...	C12000	H80
28	...	Finned tube	SB-359	...	C12200	O62
29	...	Smls. tube	SB-75	...	C12200	O50
30	...	Smls. tube	SB-75	...	C12200	O60
31	...	Smls. pipe	SB-42	...	C12200	O61
32	...	Finned tube	SB-359	...	C12200	O61
33	...	Wld. cond. tube	SB-543	...	C12200	W061
34	...	Plate, sheet, strip	SB-152	...	C12200	H00
35	...	Plate, sheet, strip	SB-152	...	C12200	H01
36	...	Plate, sheet, strip	SB-152	...	C12200	H02
37	...	Plate, sheet, strip	SB-152	...	C12200	H03
38	...	Plate, sheet, strip	SB-152	...	C12200	H04
39	...	Plate, sheet, strip	SB-152	...	C12200	M20, O25
40	...	Wld. cond. tube	SB-543	...	C12200	WC55
41	...	Smls. pipe	SB-42	...	C12200	H55
42	...	Smls. tube	SB-75	...	C12200	H55
43	...	Smls. cond. tube	SB-111	...	C12200	H55
44	...	Finned tube	SB-359	...	C12200	H55
45	...	Smls. U-bend tube	SB-395	...	C12200	H55

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	30	10	...
2	...	30	10	...
3	...	30	10	...
4	...	30	10	...
5	...	30	10	...
6	...	30	10	...
7	...	30	10	...
8	...	30	10	...
9	...	30	10	...
10	...	30	10	...
11	...	30	10	...
12	...	30	10	...
13	...	30	10	...
14	...	30	10	...
15	All	28	8	...
16	All	28	8	...
17	...	30	10	...
18	All	30	9	...
19	All	30	9	...
20	All	30	9	...
21	2 < NPS ≤ 12	36	30	...
22	All	36	30	...
23	...	36	30	...
24	...	36	30	...
25	$\frac{1}{8}$ < NPS ≤ 2	45	40	...
26	<4	45	40	...
27	...	45	40	...
28	...	30	6.5	...
29	All	30	9	...
30	All	30	9	...
31	All	30	9	...
32	...	30	9	...
33	...	30	9	...
34	...	30	10	...
35	...	30	10	...
36	...	30	10	...
37	...	30	10	...
38	...	30	10	...
39	...	30	10	...
40	...	32	15	...
41	2 < NPS ≤ 12	36	30	...
42	All	36	30	...
43	...	36	30	...
44	...	36	30	...
45	...	36	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
2	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
3	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
4	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
5	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
6	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
7	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
8	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
9	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
10	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
11	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
12	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
13	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
14	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
15	8.0	6.8	6.5	6.4	6.3	6.1	5.8	5.6	...
16	8.0	7.0	7.0	7.0	7.0	6.8	6.5	6.1	...
17	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
18	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
19	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
20	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
21	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
22	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
23	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
24	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
25	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
26	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
27	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
28	6.5	5.7	5.7	5.7	5.7	5.5	5.3	5.0	...
29	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
30	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
31	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
32	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
33	9.0	7.9	7.9	7.9	7.9	7.6	7.3	6.9	...
34	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
35	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
36	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
37	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
38	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
39	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
40	15.0	14.8	14.5	14.1	13.5	12.9	12.2	11.5	...
41	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
42	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
43	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
44	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
45	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Smls. pipe	SB-42	...	C12200	H80
2	...	Smls. cond. tube	SB-75	...	C12200	H80
3	...	Smls. tube	SB-111	...	C12200	H80
4	...	Plate, sheet, strip, bar	SB-152	...	C12300	H00
5	...	Plate, sheet, strip, bar	SB-152	...	C12300	H01
6	...	Plate, sheet, strip, bar	SB-152	...	C12300	H02
7	...	Plate, sheet, strip, bar	SB-152	...	C12300	H03
8	...	Plate, sheet, strip, bar	SB-152	...	C12300	H04
9	...	Plate, sheet, strip, bar	SB-152	...	C12300	M20, O25
10	...	Plate, sheet, strip	SB-152	...	C14200	M20, O25
11	...	Smls. cond. tube	SB-111	...	C14200	H55
12	...	Smls. U-bend tube	SB-395	...	C14200	H55
13	...	Smls. cond. tube	SB-111	...	C14200	H80
14	...	Smls. cond. tube	SB-111	...	C19200	O61
15	...	Smls. U-bend tube	SB-395	...	C19200	O61
16	...	Wld. cond. tube	SB-543	...	C19400	W061
17	...	Wld. cond. tube	SB-543	...	C19400	WC55
18	...	Smls. pipe	SB-43	...	C23000	O61 and H58
19	...	Smls. cond. tube	SB-111	...	C23000	O61
20	...	Smls. tube	SB-135	...	C23000	O50 and O60
21	...	Smls. U-bend tube	SB-395	...	C23000	O61
22	...	Wld. cond. tube	SB-543	...	C23000	W061 and WC55
23	...	Smls. tube	SB-111	...	C28000	O25
24	...	Plate	SB-171	...	C36500	O25 and M20
25	...	Plate	SB-171	...	C36500	O25 and M20
26	...	Plate	SB-171	...	C36500	O25 and M20
(23) 27	...	Forgings	SB-283	...	C37700	M10, M11, O20
(23) 28	...	Forgings	SB-283	...	C37700	M10, M11, O20
29	...	Plate	SB-171	...	C44300	M10, M20
30	...	Plate	SB-171	...	C44300	O20, O25
31	...	Smls. cond. tube	SB-111	...	C44300	O61
32	...	Finned tube	SB-359	...	C44300	O61
33	...	Smls. U-bend tube	SB-395	...	C44300	O61
34	...	Wld. cond. tube	SB-543	...	C44300	W061
35	...	Plate	SB-171	...	C44400	M10, M20
36	...	Plate	SB-171	...	C44400	O20, O25
37	...	Smls. cond. tube	SB-111	...	C44400	O61
38	...	Finned tube	SB-359	...	C44400	O61
39	...	Smls. U-bend tube	SB-395	...	C44400	O61
40	...	Wld. cond. tube	SB-543	...	C44400	W061
41	...	Plate	SB-171	...	C44500	M10, M20
42	...	Plate	SB-171	...	C44500	O20, O25
43	...	Smls. cond. tube	SB-111	...	C44500	O61
44	...	Finned tube	SB-359	...	C44500	O61
45	...	Smls. U-bend tube	SB-395	...	C44500	O61

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	$\frac{1}{8} < \text{NPS} \leq 3$	45	40	...
2	< 4	45	40	...
3	...	45	40	...
4	...	30	10	...
5	...	30	10	...
6	...	30	10	...
7	...	30	10	...
8	...	30	10	...
9	...	30	10	...
10	...	30	10	...
11	...	36	30	...
12	...	36	30	...
13	...	45	40	...
14	...	38	12	...
15	...	38	12	...
16	...	45	15	...
17	...	45	22	...
18	...	40	12	...
19	...	40	12	...
20	...	40	12	...
21	...	40	12	...
22	...	40	12	...
23	...	50	20	...
24	> 3.5 to ≤ 5	40	12	...
25	> 2 to ≤ 3.5	45	15	...
26	≤ 2	50	20	...
27	$> 1\frac{1}{2}$	46	15	...
28	$\leq 1\frac{1}{2}$	50	18	...
29	≤ 4	45	15	...
30	≤ 4	45	15	...
31	...	45	15	...
32	...	45	15	...
33	...	45	15	...
34	...	45	15	...
35	≤ 4	45	15	...
36	≤ 4	45	15	...
37	...	45	15	...
38	...	45	15	...
39	...	45	15	...
40	...	45	15	...
41	≤ 4	45	15	...
42	≤ 4	45	15	...
43	...	45	15	...
44	...	45	15	...
45	...	45	15	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
2	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
3	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
4	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
5	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
6	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
7	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
8	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
9	10.0	8.8	8.8	8.8	8.8	8.5	8.1	7.7	...
10	10.0	8.5	8.1	8.0	7.8	7.6	7.3	7.0	...
11	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
12	30.0	29.7	29.0	28.1	27.0	25.7	24.4	23.0	...
13	40.0	38.3	37.6	36.9	35.7	33.7	30.5	25.5	...
14	12.0	10.7	10.1	9.6	9.3	9.0	8.8	8.5	...
15	12.0	10.7	10.1	9.6	9.3	9.0	8.8	8.5	...
16	15.0	14.8	14.6	14.3	13.8	13.4	12.8	12.3	...
17	22.0	21.8	21.4	20.9	20.3	19.6	18.8	18.0	...
18	12.0	12.0	12.0	12.0	12.0	12.0	11.9	11.6	11.0
19	12.0	12.0	12.0	12.0	12.0	12.0	11.9	11.6	11.0
20	12.0	12.0	12.0	12.0	12.0	12.0	11.9	11.6	11.0
21	12.0	12.0	12.0	12.0	12.0	12.0	11.9	11.6	11.0
22	12.0	12.0	12.0	12.0	12.0	12.0	11.9	11.6	11.0
23	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	...
24	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.9	...
25	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.8	...
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.8	...
27	15.0	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
28	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
29	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
30	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
31	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
32	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
33	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
34	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
35	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
36	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
37	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
38	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
39	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
40	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
41	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
42	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
43	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
44	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
45	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)
(23)

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Wld. cond. tube	SB-543	...	C44500	W061
2	...	Plate	SB-171	...	C46400	M10, M20
3	...	Plate	SB-171	...	C46400	O20, O25
4	...	Plate	SB-171	...	C46500	M10, M20
5	...	Plate	SB-171	...	C46500	O20, O25
6	...	Smls. cond. tube	SB-111	...	C60800	O61
7	...	Smls. U-bend tube	SB-395	...	C60800	O61
8	...	Plate, sheet	SB-169	...	C61400	O25 or O60
9	...	Plate	SB-171	...	C61400	M10, M20, O20, O25
10	...	Rod	SB-150	...	C61400	HR50
11	...	Plate, sheet	SB-169	...	C61400	O25 or O60
12	...	Plate	SB-171	...	C61400	M10, M20, O20, O25
13	...	Rod	SB-150	...	C61400	HR50
14	...	Plate, sheet	SB-169	...	C61400	O25 or O60
15	...	Rod	SB-150	...	C61400	HR50
16	...	Rod	SB-150	...	C61400	HR50
17	...	Plate	SB-171	...	C63000	M10, M20, O20, O25
18	...	Bar, rod	SB-150	...	C63000	M20, M30
19	...	Bar, rod	SB-150	...	C63000	O20, O25, O30
20	...	Bar, rod	SB-150	...	C63000	HR50
21	...	Plate	SB-171	...	C63000	M10, M20, O20, O25
22	...	Bar, rod	SB-150	...	C63000	HR50
23	...	Bar, rod	SB-150	...	C63000	M20, M30
24	...	Bar, rod	SB-150	...	C63000	O20, O25, O30
25	...	Plate	SB-171	...	C63000	M10, M20, O20, O25
26	...	Bar, rod	SB-150	...	C63000	HR50
27	...	Bar, rod	SB-150	...	C63000	HR50
28	...	Forgings	SB-283	...	C64200	M10
29	...	Forgings	SB-283	...	C64200	M10
30	...	Bar, rod	SB-150	...	C64200	M10, M20, M30
31	...	Bar, rod	SB-150	...	C64200	M30
32	...	Bar, rod	SB-150	...	C64200	M10, M20, M30
33	...	Bar, rod	SB-150	...	C64200	HR50
34	...	Bar, rod	SB-150	...	C64200	HR50
35	...	Bar, rod	SB-150	...	C64200	HR50
36	...	Bar, rod	SB-150	...	C64200	HR50
37	...	Bar, rod	SB-98	...	C65100	O60
38	...	Bar, rod	SB-98	...	C65100	H02
39	...	Rod	SB-98	...	C65100	H06
40	...	Rod	SB-98	...	C65100	H06
41	...	Rod	SB-98	...	C65100	H06
42	...	Smls. pipe & tube	SB-315	...	C65500	O61
43	...	Plate, sheet	SB-96	...	C65500	O61
44	...	Bar, rod	SB-98	...	C65500	O60
45	...	Rod	SB-98	...	C65500	H01

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	45	15	...
2	$3 < t \leq 5$	50	18	...
3	≤ 3	50	20	...
4	$3 < t \leq 5$	50	18	...
5	≤ 3	50	20	...
6	...	50	19	...
7	...	50	19	...
8	$2 < t \leq 5$	65	28	...
9	$2 < t \leq 5$	65	28	...
10	$2 < t \leq 3$	70	30	...
11	$\frac{1}{2} < t \leq 2$	70	30	...
12	≤ 2	70	30	...
13	$1 < t \leq 2$	70	32	...
14	$\leq \frac{1}{2}$	72	32	...
15	$\frac{1}{2} < t \leq 1$	75	35	...
16	$\leq \frac{1}{2}$	80	40	...
17	$3.5 < t \leq 5$	80	30	...
18	> 4	80	40	...
19	> 4	80	40	...
20	> 4	80	40	...
21	$2 < t \leq 3.5$	85	33	...
22	$2 < t \leq 4$	85	42.5	...
23	$2 < t \leq 4$	85	42.5	...
24	$2 < t \leq 4$	85	42.5	...
25	≤ 2	90	36	...
26	$1 < t \leq 2$	90	45	...
27	$\frac{1}{2} < t \leq 1$	100	50	...
28	$> 1\frac{1}{2}$	68	23	...
29	$\leq 1\frac{1}{2}$	70	25	...
30	> 4	70	25	...
31	> 4	70	25	...
32	$3 < t \leq 4$	70	30	...
33	$2 < t \leq 3$	75	35	...
34	$1 < t \leq 2$	80	42	...
35	$\frac{1}{2} < t \leq 1$	85	45	...
36	$\leq \frac{1}{2}$	90	45	...
37	All	40	12	...
38	≤ 2	55	20	...
39	$1 < t \leq 1\frac{1}{2}$	75	40	...
40	$\frac{1}{2} < t \leq 1$	75	45	...
41	$t \leq \frac{1}{2}$	85	55	...
42	...	50	15	...
43	≤ 2	50	18	...
44	All	52	15	...
45	All	55	24	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	15.0	15.0	15.0	15.0	15.0	15.0	14.9	14.7	...
2	18.0	18.0	18.0	18.0	18.0	18.0	17.7	17.3	16.6
3	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.4
4	18.0	18.0	18.0	18.0	18.0	18.0	17.7	17.3	16.6
5	20.0	20.0	20.0	20.0	20.0	20.0	19.7	19.2	18.4
6	19.0	18.3	18.3	18.3	18.0	17.5	17.0	16.5	16.0
7	19.0	18.3	18.3	18.3	18.0	17.5	17.0	16.5	16.0
8	28.0	27.9	27.7	27.5	27.4	27.2	26.9	26.6	26.3
9	28.0	27.9	27.7	27.5	27.4	27.2	26.9	26.6	26.3
10	30.0	29.9	29.7	29.5	29.3	29.1	28.8	28.5	28.2
11	30.0	29.9	29.7	29.5	29.3	29.1	28.8	28.5	28.2
12	30.0	29.9	29.7	29.5	29.3	29.1	28.8	28.5	28.2
13	32.0	31.9	31.7	31.5	31.3	31.0	30.7	30.4	30.1
14	32.0	31.9	31.7	31.4	31.3	31.1	30.8	30.4	30.1
15	35.0	34.9	34.7	34.4	34.2	34.0	33.6	33.3	32.9
16	40.0	39.9	39.6	39.3	39.1	38.8	38.4	38.0	37.6
17	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.8	29.5
18	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.8	39.4
19	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.8	39.4
20	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.8	39.4
21	33.0	33.0	33.0	33.0	33.0	33.0	33.0	32.8	32.5
22	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.2	41.8
23	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.2	41.8
24	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.2	41.8
25	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.8	35.4
26	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.7	44.3
27	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.7	49.2
28	23.0	21.6	21.2	21.2	21.2	21.2	21.2	21.2	21.2
29	25.0	23.5	23.1	23.0	23.0	23.0	23.0	23.0	23.0
30	25.0	23.5	23.1	23.0	23.0	23.0	23.0	23.0	23.0
31	25.0	...	...	...	...	...	...	...	...
32	30.0	28.2	27.7	27.6	27.6	27.6	27.6	27.6	27.6
33	35.0	32.9	32.3	32.2	32.2	32.2	32.2	32.2	32.2
34	42.0	39.4	38.8	38.7	38.7	38.7	38.7	38.7	38.7
35	45.0	42.3	41.6	41.4	41.4	41.4	41.4	41.4	41.4
36	45.0	42.3	41.6	41.4	41.4	41.4	41.4	41.4	41.4
37	12.0	11.9	11.8	11.8	11.7	11.5	11.4	11.2	10.9
38	20.0	20.0	19.8	19.4	18.8	18.0	17.2	16.2	15.3
39	40.0	39.3	38.4	37.5	36.3	35.0	33.5	31.7	29.4
40	45.0	44.2	43.2	42.1	40.9	39.4	37.7	35.6	33.1
41	55.0	54.0	52.8	51.5	50.0	48.2	46.1	43.5	40.5
42	15.0	15.0	14.9	14.9	14.8	14.7	14.6	14.5	14.2
43	18.0	18.0	17.9	17.9	17.8	17.7	17.6	17.3	17.0
44	15.0	15.0	14.9	14.9	14.8	14.7	14.6	14.5	14.2
45	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.6	20.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)										
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...
17	29.0	27.9	26.1	23.1	...	...	...	...	...	...
18	38.7	37.2	34.7	30.8	...	...	...	...	...	...
19	38.7	37.2	34.7	30.8	...	...	...	...	...	...
20	38.7	37.2	34.7	30.8	...	...	...	...	...	...
21	31.9	30.7	28.7	25.4	...	...	...	...	...	...
22	41.1	39.6	36.9	32.7	...	...	...	...	...	...
23	41.1	39.6	36.9	32.7	...	...	...	...	...	...
24	41.1	39.6	36.9	32.7	...	...	...	...	...	...
25	34.8	33.5	31.3	27.7	...	...	...	...	...	...
26	43.5	41.9	39.1	34.6	...	...	...	...	...	...
27	48.3	46.5	43.4	38.5	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Bar, rod	SB-98	...	C65500	H02
2	...	Rod	SB-98	...	C66100	O60
3	...	Rod	SB-98	...	C66100	H01
4	...	Rod	SB-98	...	C66100	H02
5	...	Smls. cond. tube	SB-111	...	C68700	O61
6	...	Smls. U-bend tube	SB-395	...	C68700	O61
7	...	Wld. cond. tube	SB-543	...	C68700	W061
(23) 8	...	Smls. cond. tube	SB-111	...	C70400	O61
(23) 9	...	Wld. tube	SB-543	...	C70400	W061
(23) 10	...	Smls. cond. tube	SB-111	...	C70400	H55
11	...	Smls. pipe & tube	SB-466	...	C70600	O60
12	...	Wld. pipe	SB-467	...	C70600	W061
13	...	Bar, rod	SB-151	...	C70600	O60
14	...	Plate, sheet	SB-171	...	C70600	M10, M20
15	...	Plate, sheet	SB-171	...	C70600	O20, O25
16	...	Smls. cond. tube	SB-111	...	C70600	O61
17	...	Finned tube	SB-359	...	C70600	O61
18	...	Smls. U-bend tube	SB-395	...	C70600	O61
19	...	Wld. pipe	SB-467	...	C70600	W061
20	...	Wld. tube	SB-543	...	C70600	W061
21	...	Finned wld. tube	SB-956	...	C70600	W061
22	...	Wld. pipe	SB-467	...	C70600	WM50
23	...	Smls. tube	SB-111	...	C70600	H55
24	...	Smls. pipe & tube	SB-466	...	C70600	H55
25	...	Wld. tube	SB-543	...	C70600	WC55
26	...	Finned wld. tube	SB-956	...	C70600	WC55
27	...	Wld. pipe	SB-467	...	C70600	Wld. fr. cold rld. strip
28	...	Smls. pipe & tube	SB-466	...	C70620	O60
29	...	Wld. pipe	SB-467	...	C70620	W061
30	...	Bar, rod	SB-151	...	C70620	O60
31	...	Forgings	SB-283	...	C70620	M10
32	...	Plate, sheet	SB-171	...	C70620	M10, M20
33	...	Forgings	SB-283	...	C70620	O20
34	...	Plate, sheet	SB-171	...	C70620	O20, O25
35	...	Smls. cond. tube	SB-111	...	C70620	O61
36	...	Finned tube	SB-359	...	C70620	O61
37	...	Smls. U-bend tube	SB-395	...	C70620	O61
38	...	Wld. pipe	SB-467	...	C70620	W061
39	...	Wld. tube	SB-543	...	C70620	W061
40	...	Finned wld. tube	SB-956	...	C70620	W061
41	...	Forgings	SB-283	...	C70620	M10
42	...	Wld. pipe	SB-467	...	C70620	WM50
43	...	Smls. tube	SB-111	...	C70620	H55
44	...	Smls. pipe & tube	SB-466	...	C70620	H55
45	...	Wld. tube	SB-543	...	C70620	WC55

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	≤2	70	38	...
2	All	52	15	...
3	All	55	24	...
4	≤2	70	38	...
5	...	50	18	...
6	...	50	18	...
7	...	50	18	...
8	...	38	12	...
9	...	38	12	...
10	...	40	30	...
11	...	38	13	...
12	>4 ^{1/2}	38	13	...
13	All	38	15	...
14	≤5	40	15	...
15	≤5	40	15	...
16	...	40	15	...
17	...	40	15	...
18	...	40	15	...
19	≤4 ^{1/2}	40	15	...
20	...	40	15	...
21	...	40	15	...
22	≤4 ^{1/2}	45	30	...
23	...	45	35	...
24	...	45	35	...
25	...	45	35	...
26	...	45	35	...
27	≤4 ^{1/2}	54	45	...
28	...	38	13	...
29	>4 ^{1/2}	38	13	...
30	All	38	15	...
31	>6	40	15	...
32	≤5	40	15	...
33	...	40	15	...
34	≤5	40	15	...
35	...	40	15	...
36	...	40	15	...
37	...	40	15	...
38	≤4 ^{1/2}	40	15	...
39	...	40	15	...
40	...	40	15	...
41	≤6	45	18	...
42	≤4 ^{1/2}	45	30	...
43	...	45	35	...
44	...	45	35	...
45	...	45	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	38.0	37.6	37.2	36.6	35.8	34.5	32.6	29.9	26.4
2	15.0	15.0	14.9	14.9	14.8	14.7	14.6	14.5	14.2
3	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.6	20.1
4	38.0	37.6	37.2	36.6	35.8	34.5	32.6	29.9	26.4
5	18.0	17.8	17.7	17.6	17.4	17.3	17.1	16.8	...
6	18.0	17.8	17.7	17.6	17.4	17.3	17.1	16.8	...
7	18.0	17.8	17.7	17.6	17.4	17.3	17.1	16.8	...
8	12.0	11.6	11.3	11.1	11.0	10.9	...	...	...
9	12.0	11.6	11.3	11.1	11.0	10.9	...	...	...
10	30.0	28.9	28.3	27.8	27.5	27.3	...	...	...
11	13.0	12.6	12.3	12.0	11.7	11.5	11.3	11.1	10.9
12	13.0	12.6	12.3	12.0	11.7	11.5	11.3	11.1	10.9
13	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
14	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
15	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
16	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
17	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
18	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
19	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
20	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
21	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
22	30.0	29.1	28.5	27.8	27.1	26.5	26.0	25.6	25.3
23	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
24	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
25	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
26	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
27	45.0	43.7	42.7	41.6	40.7	39.8	39.0	38.4	37.9
28	13.0	12.6	12.3	12.0	11.7	11.5	11.3	11.1	10.9
29	13.0	12.6	12.3	12.0	11.7	11.5	11.3	11.1	10.9
30	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
31	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
32	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
33	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
34	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
35	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
36	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
37	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
38	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
39	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
40	15.0	14.6	14.2	13.9	13.6	13.3	13.0	12.8	12.6
41	18.0	17.5	17.0	16.7	16.3	16.0	15.6	15.4	15.1
42	30.0	29.1	28.5	27.8	27.1	26.5	26.0	25.6	25.3
43	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
44	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
45	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...
11	10.8	10.8	...	...	...	...	...	...	...	...
12	10.8	10.8	...	...	...	...	...	...	...	...
13	12.5	12.4	...	...	...	...	...	...	...	...
14	12.5	12.4	...	...	...	...	...	...	...	...
15	12.5	12.4	...	...	...	...	...	...	...	...
16	12.5	12.4	...	...	...	...	...	...	...	...
17	12.5	12.4	...	...	...	...	...	...	...	...
18	12.5	12.4	...	...	...	...	...	...	...	...
19	12.5	12.4	...	...	...	...	...	...	...	...
20	12.5	12.4	...	...	...	...	...	...	...	...
21	12.5	12.4	...	...	...	...	...	...	...	...
22	25.0	24.9	...	...	...	...	...	...	...	...
23	29.2	29.0	...	...	...	...	...	...	...	...
24	29.2	29.0	...	...	...	...	...	...	...	...
25	29.2	29.0	...	...	...	...	...	...	...	...
26	29.2	29.0	...	...	...	...	...	...	...	...
27	37.5	37.3	...	...	...	...	...	...	...	...
28	10.8	10.8	...	...	...	...	...	...	...	...
29	10.8	10.8	...	...	...	...	...	...	...	...
30	12.5	12.4	...	...	...	...	...	...	...	...
31	12.5	12.4	...	...	...	...	...	...	...	...
32	12.5	12.4	...	...	...	...	...	...	...	...
33	12.5	12.4	...	...	...	...	...	...	...	...
34	12.5	12.4	...	...	...	...	...	...	...	...
35	12.5	12.4	...	...	...	...	...	...	...	...
36	12.5	12.4	...	...	...	...	...	...	...	...
37	12.5	12.4	...	...	...	...	...	...	...	...
38	12.5	12.4	...	...	...	...	...	...	...	...
39	12.5	12.4	...	...	...	...	...	...	...	...
40	12.5	12.4	...	...	...	...	...	...	...	...
41	15.0	14.9	...	...	...	...	...	...	...	...
42	25.0	24.9	...	...	...	...	...	...	...	...
43	29.2	29.0	...	...	...	...	...	...	...	...
44	29.2	29.0	...	...	...	...	...	...	...	...
45	29.2	29.0	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

(23)
(23)
(23)

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Finned wld. tube	SB-956	...	C70620	WC55
2	...	Wld. pipe	SB-467	...	C70620	Wld. fr. cold rld. strip
(23) 3	...	Smls. tube	SB-466	...	C71000	O60
(23) 4	...	Smls. cond. tube	SB-111	...	C71000	O61
(23) 5	...	Finned tube	SB-359	...	C71000	O61
(23) 6	...	Smls. tube	SB-395	...	C71000	O61
7	...	Wld. pipe	SB-467	...	C71500	W061
8	...	Plate, sheet	SB-171	...	C71500	M10, M20, O20, O25
9	...	Plate, sheet	SB-171	...	C71500	M10, M20, O20, O25
10	...	Wld. pipe	SB-467	...	C71500	W061
11	...	Smls. pipe & tube	SB-466	...	C71500	O60
12	...	Smls. cond. tube	SB-111	...	C71500	O61
13	...	Finned tube	SB-359	...	C71500	O61
14	...	Smls. U-bend tube	SB-395	...	C71500	O61
15	...	Wld. tube	SB-543	...	C71500	W061
(23) 16	...	Finned wld. tube	SB-956	...	C71500	W061
(23) 17	...	Smls. cond. tube	SB-111	...	C71500	HR50
(23) 18	...	Smls. U-bend tube	SB-395	...	C71500	HR50
19	...	Wld. pipe	SB-467	...	C71520	W061
20	...	Forgings	SB-283	...	C71520	M10
21	...	Forgings	SB-283	...	C71520	O20
22	...	Plate, sheet	SB-171	...	C71520	O25
23	...	Forgings	SB-283	...	C71520	M10
24	...	Plate, sheet	SB-171	...	C71520	O25
25	...	Wld. pipe	SB-467	...	C71520	W061
26	...	Smls. pipe & tube	SB-466	...	C71520	O60
27	...	Smls. cond. tube	SB-111	...	C71520	O61
28	...	Finned tube	SB-359	...	C71520	O61
29	...	Smls. U-bend tube	SB-395	...	C71520	O61
30	...	Wld. tube	SB-543	...	C71520	W061
(23) 31	...	Finned wld. tube	SB-956	...	C71520	W061
(23) 32	...	Smls. cond. tube	SB-111	...	C71520	HR50
(23) 33	...	Smls. U-bend tube	SB-395	...	C71520	HR50
(23) 34	...	Smls. cond. tube	SB-111	...	C72200	O61
35	...	Castings	SB-62	...	C83600	M01
36	...	Castings	SB-61	...	C92200	M01
37	...	Castings	SB-584	...	C92200	M01
38	...	Castings	SB-584	...	C93700	M01
39	...	Castings	SB-148	...	C95200	M01
40	...	Castings	SB-271	...	C95200	M02
41	...	Castings	SB-505	...	C95200	M07
42	...	Castings	SB-148	...	C95400	M01
43	...	Castings	SB-271	...	C95400	M02
44	...	Castings	SB-148	...	C95800	M01
45	...	Castings	SB-148	...	C95820	M01

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	45	35	...
2	$\leq 4\frac{1}{2}$	54	45	...
3	...	45	16	...
4	...	45	16	...
5	...	45	16	...
6	...	45	16	...
7	$> 4\frac{1}{2}$	45	15	...
8	$2.5 < t \leq 5$	45	18	...
9	≤ 2.5	50	20	...
10	$\leq 4\frac{1}{2}$	50	20	...
11	...	52	18	...
12	...	52	18	...
13	...	52	18	...
14	...	52	18	...
15	...	52	18	...
16	...	52	18	...
17	...	72	50	...
18	...	72	50	...
19	$> 4\frac{1}{2}$	45	15	...
20	> 6	45	18	...
21	...	45	18	...
22	$2.5 < t \leq 5$	45	18	...
23	≤ 6	50	20	...
24	≤ 2.5	50	20	...
25	$\leq 4\frac{1}{2}$	50	20	...
26	...	52	18	...
27	...	52	18	...
28	...	52	18	...
29	...	52	18	...
30	...	52	18	...
31	...	52	18	...
32	...	72	50	...
33	...	72	50	...
34	...	45	16	...
35	...	30	14	...
36	...	34	16	...
37	...	34	16	...
38	...	30	12	...
39	...	65	25	...
40	...	65	25	...
41	...	68	26	...
42	...	75	30	...
43	...	75	30	...
44	...	85	35	...
45	...	94	39	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	35.0	34.0	33.2	32.4	31.6	30.9	30.3	29.8	29.5
2	45.0	43.7	42.7	41.6	40.7	39.8	39.0	38.4	37.9
3	16.0	15.6	15.3	14.9	14.5	14.1	13.8	13.4	13.0
4	16.0	15.6	15.3	14.9	14.5	14.1	13.8	13.4	13.0
5	16.0	15.6	15.3	14.9	14.5	14.1	13.8	13.4	13.0
6	16.0	15.6	15.3	14.9	14.5	14.1	13.8	13.4	13.0
7	15.0	14.5	14.1	13.8	13.5	13.2	12.9	12.6	12.4
8	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
9	20.0	19.3	18.8	18.4	18.0	17.6	17.2	16.9	16.5
10	20.0	19.3	18.8	18.4	18.0	17.6	17.2	16.9	16.5
11	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
12	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
13	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
14	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
15	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
16	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
17	50.0	48.2	47.5	46.8	46.2	45.6	45.0	44.4	43.9
18	50.0	48.2	47.5	46.8	46.2	45.6	45.0	44.4	43.9
19	15.0	14.5	14.1	13.8	13.5	13.2	12.9	12.6	12.2
20	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
21	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
22	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
23	20.0	19.3	18.8	18.4	18.0	17.6	17.2	16.9	16.5
24	20.0	19.3	18.8	18.4	18.0	17.6	17.2	16.9	16.5
25	20.0	19.3	18.8	18.4	18.0	17.6	17.2	16.9	16.5
26	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
27	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
28	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
29	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
30	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
31	18.0	17.4	17.0	16.6	16.2	15.8	15.5	15.2	14.9
32	50.0	48.2	47.5	46.8	46.2	45.6	45.0	44.4	43.9
33	50.0	48.2	47.5	46.8	46.2	45.6	45.0	44.4	43.9
34	16.0	15.6	15.2	14.8	14.5	14.2	13.9	13.7	...
35	14.0	13.1	12.6	12.1	11.7	11.3	10.9	10.5	10.1
36	16.0	15.0	14.3	13.8	13.5	13.3	13.2	13.1	13.0
37	16.0	15.0	14.3	13.8	13.5	13.3	13.2	13.1	13.0
38	12.0	11.1	10.7	10.4	10.3	10.1	10.0	9.9	9.8
39	25.0	23.5	22.8	22.2	21.7	21.4	21.3	21.2	21.2
40	25.0	23.5	22.8	22.2	21.7	21.4	21.3	21.2	21.2
41	26.0	24.5	23.7	23.0	22.6	22.3	22.1	22.1	22.1
42	30.0	29.5	29.3	29.1	28.9	28.9	28.9	28.9	28.9
43	30.0	29.5	29.3	29.1	28.9	28.9	28.9	28.9	28.9
44	35.0	34.5	34.3	34.2	34.0	33.9	33.8	...	...
45	39.0	38.5	38.2	38.1	37.9	37.8	37.6	37.5	37.2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	29.2	29.0	...	...	...	...	...	...	...	...
2	37.5	37.3	...	...	...	...	...	...	...	...
3	12.7	12.5	12.2	12.0	...	...	...	...	...	...
4	12.7	12.5	12.2	12.0	...	...	...	...	...	...
5	12.7	12.5	12.2	12.0	...	...	...	...	...	...
6	12.7	12.5	12.2	12.0	...	...	...	...	...	...
7	12.2	12.0	11.9	11.7	...	...	...	...	...	...
8	14.6	14.4	14.2	14.1	...	...	...	...	...	...
9	16.3	16.0	15.8	15.7	...	...	...	...	...	...
10	16.3	16.0	15.8	15.7	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...
12	14.6	14.4	14.2	14.1	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...
15	14.6	14.4	14.2	14.1	...	...	...	...	...	...
16	14.6	14.4	14.2	14.1	...	...	...	...	...	...
17	43.5	43.2	42.9	42.6	...	...	...	...	...	...
18	43.5	43.2	42.9	42.6	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...
20	14.6	14.4	14.2	14.1	...	...	...	...	...	...
21	14.6	14.4	14.2	14.1	...	...	...	...	...	...
22	14.6	14.4	14.2	14.1	...	...	...	...	...	...
23	16.3	16.0	15.8	15.7	...	...	...	...	...	...
24	16.3	16.0	15.8	15.7	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	14.6	14.4	14.2	14.1	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...
30	14.6	14.4	14.2	14.1	...	...	...	...	...	...
31	14.6	14.4	14.2	14.1	...	...	...	...	...	...
32	43.5	43.2	42.9	42.6	...	...	...	...	...	...
33	43.5	43.2	42.9	42.6	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...
36	12.8	12.8	...	...	...	...	...	...	...	...
37	12.8	12.8	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...
39	21.2	21.2	...	...	...	...	...	...	...	...
40	21.2	21.2	...	...	...	...	...	...	...	...
41	22.1	22.1	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	(23)
4	...	...	...	...	...	...	...	...	...	...	...	...	(23)
5	...	...	...	...	...	...	...	...	...	...	...	...	(23)
6	...	...	...	...	...	...	...	...	...	...	...	...	(23)
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	(23)
18	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	(23)
33	...	...	...	...	...	...	...	...	...	...	...	...	(23)
34	...	...	...	...	...	...	...	...	...	...	...	...	(23)
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	...	Castings	SB-369	...	C96200	M01
2	...	Castings	SB-584	...	C97600	M01
3	99Ni	Bolting	SB-160	...	N02200	Annealed
4	99Ni	Plate, sheet, strip	SB-162	...	N02200	As rolled
5	99Ni	Bolting	SB-160	...	N02200	Hot fin./ann.
6	99Ni	Bolting	SB-160	...	N02200	Cold drawn
7	99Ni	Smls. pipe & tube	SB-161	...	N02200	Stress rel.
8	99Ni	Smls. tube	SB-163	...	N02200	Stress rel.
9	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed
10	99Ni-Low C	Smls. & wld. fittings	SB-366	...	N02201	Annealed
11	99Ni-Low C	Bar, rod	SB-160	...	N02201	Hot rolled/ann.
12	99Ni-Low C	Smls. pipe & tube	SB-161	...	N02201	Annealed
13	99Ni-Low C	Smls. tube	SB-163	...	N02201	Annealed
14	99Ni-Low C	Plate, sheet, strip	SB-162	...	N02201	Hot rolled/ann.
15	67Ni-30Cu	Bar	SB-164	...	N04400	Annealed
16	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed
17	67Ni-30Cu	Forgings	SB-564	...	N04400	Annealed
18	67Ni-30Cu	Plate	SB-127	...	N04400	Annealed
19	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Annealed
20	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Annealed
21	67Ni-30Cu	Smls. & wld. fittings	SB-366	...	N04400	Annealed
22	67Ni-30Cu	Plate	SB-127	...	N04400	As rolled
23	67Ni-30Cu	Rounds	SB-164	...	N04400	Hot worked
24	67Ni-30Cu	Rounds	SB-164	...	N04400	Hot worked
25	67Ni-30Cu	Rounds	SB-164	...	N04400	CW & SR
26	67Ni-30Cu	Rounds	SB-164	...	N04400	CW & SR
27	67Ni-30Cu	Smls. tube	SB-163	...	N04400	Stress rel.
28	67Ni-30Cu	Smls. pipe & tube	SB-165	...	N04400	Stress rel.
29	67Ni-30Cu	Rounds	SB-164	...	N04400	CW & SR
30	67Ni-30Cu	Rounds	SB-164	...	N04400	Cold worked
31	67Ni-30Cu-S	Bar	SB-164	...	N04405	Annealed
32	67Ni-30Cu-S	Bar	SB-164	...	N04405	Hot worked
33	67Ni-28Cu-3Al	Bolting	SF-468	...	N05500	Ann./aged
34	67Ni-28Cu-3Al	Bolting	SF-468	...	N05500	Ann./aged
35	47Ni-22Cr-9Mo-18Fe	Plate	SB-435	...	N06002	Annealed
36	47Ni-22Cr-9Mo-18Fe	Sheet	SB-435	...	N06002	Solution ann.
37	47Ni-22Cr-9Mo-18Fe	Rod	SB-572	...	N06002	Annealed
38	47Ni-22Cr-9Mo-18Fe	Smls. & wld. fittings	SB-366	...	N06002	Annealed
39	47Ni-22Cr-9Mo-18Fe	Sheet	SB-435	...	N06002	Annealed
40	47Ni-22Cr-9Mo-18Fe	Wld. pipe	SB-619	...	N06002	Solution ann.
41	47Ni-22Cr-9Mo-18Fe	Smls. pipe & tube	SB-622	...	N06002	Solution ann.
42	47Ni-22Cr-9Mo-18Fe	Wld. tube	SB-626	...	N06002	Solution ann.
43	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
44	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
45	47Ni-22Cr-19Fe-6Mo	Smls. & wld. fittings	SB-366	...	N06007	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	45	25	...
2	...	40	17	...
3	...	55	15	...
4	...	55	20	...
5	...	60	15	...
6	...	65	40	...
7	...	65	40	...
8	...	65	40	...
9	>5 O.D.	50	10	...
10	...	50	10	...
11	...	50	10	...
12	≤5 O.D.	50	12	...
13	...	50	12	...
14	...	50	12	...
15	...	70	25	...
16	>5 O.D.	70	25	...
17	...	70	25	...
18	...	70	28	...
19	≤3	70	28	...
20	≤5 O.D.	70	28	...
21	...	70	28	...
22	...	75	40	...
23	$12 < t \leq 14$	75	40	...
24	≤12	80	40	...
25	<1/2	84	50	...
26	$3\frac{1}{2} < t \leq 4$	84	55	...
27	...	85	55	...
28	...	85	55	...
29	$\frac{1}{2} \leq t \leq 3\frac{1}{2}$	87	60	...
30	<1/2	110	85	...
31	...	70	25	...
32	...	75	35	...
33	1.000–1.500	130	85	...
34	0.250–0.875	130	90	...
35	>3/16	95	35	...
36	≤3/16	95	35	...
37	...	95	35	...
38	...	100	40	...
39	$\frac{1}{16} < t \leq \frac{3}{16}$	100	40	...
40	...	100	40	...
41	...	100	40	...
42	...	100	40	...
43	>3/4	85	30	...
44	>3/4	85	30	...
45	...	90	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	25.0	24.3	23.7	23.0	22.5	22.1	21.7	21.4	21.0
2	17.0	15.3	14.3	13.6	13.1	12.8	12.6	12.4	12.3
3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.7	14.2
4	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.6	18.9
5	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.7	14.2
6	40.0	38.7	38.4	38.3	38.3	38.3	38.2	37.9	37.5
7	40.0	38.7	38.4	38.3	38.3	38.3	38.2	37.9	37.5
8	40.0	38.7	38.4	38.3	38.3	38.3	38.2	37.9	37.5
9	10.0	9.7	9.6	9.5	9.4	9.4	9.4	9.4	9.4
10	10.0	9.7	9.6	9.5	9.4	9.4	9.4	9.4	9.4
11	10.0	9.7	9.6	9.5	9.4	9.4	9.4	9.4	9.4
12	12.0	11.7	11.5	11.4	11.3	11.2	11.2	11.2	11.2
13	12.0	11.7	11.5	11.4	11.3	11.2	11.2	11.2	11.2
14	12.0	11.7	11.5	11.4	11.3	11.2	11.2	11.2	11.2
15	25.0	23.0	21.9	21.0	20.4	20.0	19.7	19.7	19.7
16	25.0	23.0	21.9	21.0	20.4	20.0	19.7	19.7	19.7
17	25.0	23.0	21.9	21.0	20.4	20.0	19.7	19.7	19.7
18	28.0	25.8	24.5	23.6	22.8	22.4	22.1	22.0	22.0
19	28.0	25.8	24.5	23.6	22.8	22.4	22.1	22.0	22.0
20	28.0	25.8	24.5	23.6	22.8	22.4	22.1	22.0	22.0
21	28.0	25.8	24.5	23.6	22.8	22.4	22.1	22.0	22.0
22	40.0	39.5	38.8	37.9	37.1	36.4	35.9	35.5	35.2
23	40.0	...	38.8	...	37.1	...	35.9	...	35.2
24	40.0	...	38.8	...	37.1	...	35.9	...	35.2
25	50.0	...	47.2	...	45.8	...	45.0	...	45.0
26	55.0	...	51.8	...	50.4	...	49.7	...	49.2
27	55.0	52.9	51.8	51.0	50.4	50.0	49.7	49.5	49.2
28	55.0	52.9	51.8	51.0	50.4	50.0	49.7	49.5	49.2
29	60.0	...	56.6	...	54.9	...	54.0	...	54.0
30	85.0	...	80.2	...	77.8	...	76.5	...	76.5
31	25.0	23.0	21.9	21.0	20.4	20.0	19.7	19.7	19.7
32	35.0	34.6	33.9	33.2	32.5	31.9	31.4	31.0	30.8
33	85.0	...	81.2	...	79.4	...	78.2	...	77.5
34	90.0	...	86.0	...	84.0	...	82.8	...	82.1
35	35.0	32.9	31.5	30.1	28.8	27.7	26.6	25.7	24.8
36	35.0	32.9	31.5	30.1	28.8	27.7	26.6	25.7	24.8
37	35.0	32.9	31.5	30.1	28.8	27.7	26.6	25.7	24.8
38	40.0	37.5	35.9	34.4	33.0	31.6	30.4	29.3	28.4
39	40.0	37.5	35.9	34.4	33.0	31.6	30.4	29.3	28.4
40	40.0	37.5	35.9	34.4	33.0	31.6	30.4	29.3	28.4
41	40.0	37.5	35.9	34.4	33.0	31.6	30.4	29.3	28.4
42	40.0	37.5	35.9	34.4	33.0	31.6	30.4	29.3	28.4
43	30.0	28.1	27.0	25.9	25.0	24.2	23.5	22.9	22.4
44	30.0	28.1	27.0	25.9	25.0	24.2	23.5	22.9	22.4
45	35.0	32.8	31.4	30.2	29.2	28.2	27.4	26.7	26.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)										
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	13.6	12.9	...	...	...	...	...	...	...	...
4	18.1	17.2	...	...	...	...	...	...	...	...
5	13.6	12.9	...	...	...	...	...	...	...	...
6	37.0	36.4	35.7	...	...	...	...	...	...	...
7	37.0	36.4	35.7	...	...	...	...	...	...	...
8	37.0	36.4	35.7	...	...	...	...	...	...	...
9	9.4	9.4	9.3	9.3	9.2	9.0	8.8	8.6	8.2	7.9
10	9.4	9.4	9.3	9.3	9.2	9.0	8.8	8.6	8.2	7.9
11	9.4	9.4	9.3	9.3	9.2	9.0	8.8	8.6	8.2	7.9
12	11.2	11.2	11.2	11.1	11.0	10.8	10.6	10.3	9.9	9.4
13	11.2	11.2	11.2	11.1	11.0	10.8	10.6	10.3	9.9	9.4
14	11.2	11.2	11.2	11.1	11.0	10.8	10.6	10.3	9.9	9.4
15	19.7	19.7	19.7	19.6	19.4	19.1	18.9	18.8	...	...
16	19.7	19.7	19.7	19.6	19.4	19.1	18.9	18.8	...	...
17	19.7	19.7	19.7	19.6	19.4	19.1	18.9	18.8	...	...
18	22.0	22.0	22.0	21.9	21.7	21.4	21.2	21.1	...	...
19	22.0	22.0	22.0	21.9	21.7	21.4	21.2	21.1	...	...
20	22.0	22.0	22.0	21.9	21.7	21.4	21.2	21.1	...	...
21	22.0	22.0	22.0	21.9	21.7	21.4	21.2	21.1	...	...
22	34.9	34.7	34.4	34.0	33.5	32.9	32.3	31.6	...	...
23	...	34.7	34.4	34.0	33.5	32.9	...	...	...	...
24	...	34.7	34.4	34.0	33.5	32.9	...	...	...	...
25	...	44.2	42.1	42.1	41.8	40.4	...	...	...	...
26	...	48.1	47.3	46.3	45.3	44.4	...	...	...	...
27	48.7	48.1	47.3	46.3	45.3	44.4	...	...	...	...
28	48.7	48.1	47.3	46.3	45.3	44.4	...	...	...	...
29	...	53.0	50.5	50.5	50.1	48.5	...	...	...	...
30	...	75.1	71.6	71.6	71.0	68.7	...	...	...	...
31	19.7	19.7	19.7	19.6	19.4	19.1	18.9	18.8	...	...
32	30.6	30.3	30.1	29.8	29.3	28.8	28.2	27.7	...	...
33	...	77.1	76.9	76.7	...	...	...	...	...	...
34	...	81.6	81.4	81.2	...	...	...	...	...	...
35	24.1	23.5	23.0	22.6	22.3	22.1	21.9	21.7	21.6	21.5
36	24.1	23.5	23.0	22.6	22.3	22.1	21.9	21.7	21.6	21.5
37	24.1	23.5	23.0	22.6	22.3	22.1	21.9	21.7	21.6	21.5
38	27.5	26.9	26.3	25.8	25.5	25.2	25.0	24.9	24.7	24.6
39	27.5	26.9	26.3	25.8	25.5	25.2	25.0	24.9	24.7	24.6
40	27.5	26.9	26.3	25.8	25.5	25.2	25.0	24.9	24.7	24.6
41	27.5	26.9	26.3	25.8	25.5	25.2	25.0	24.9	24.7	24.6
42	27.5	26.9	26.3	25.8	25.5	25.2	25.0	24.9	24.7	24.6
43	22.0	21.6	21.3	21.1	20.9	20.8	20.7	20.6	20.5	20.4
44	22.0	21.6	21.3	21.1	20.9	20.8	20.7	20.6	20.5	20.4
45	25.6	25.2	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	7.3	7.0	6.7	6.4	...	...	...	...	...	...	...	...	...
10	7.3	7.0	6.7	6.4	...	...	...	...	...	...	...	...	...
11	7.3	7.0	6.7	6.4	...	...	...	...	...	...	...	...	...
12	8.8	8.4	8.0	7.7	...	...	...	...	...	...	...	...	...
13	8.8	8.4	8.0	7.7	...	...	...	...	...	...	...	...	...
14	8.8	8.4	8.0	7.7	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	21.4	21.3	21.1	20.8	20.5	20.1	19.7	19.1	18.4	17.6	16.7	15.6	14.4
36	21.4	21.3	21.1	20.8	20.5	20.1	19.7	19.1	18.4	17.6	16.7	15.6	14.4
37	21.4	21.3	21.1	20.8	20.5	20.1	19.7	19.1	18.4	17.6	16.7	15.6	14.4
38	24.5	24.3	24.1	23.8	23.4	23.0	22.5	21.8	21.1	20.1	19.1	17.8	16.4
39	24.5	24.3	24.1	23.8	23.4	23.0	22.5	21.8	21.1	20.1	19.1	17.8	16.4
40	24.5	24.3	24.1	23.8	23.4	23.0	22.5	21.8	21.1	20.1	19.1	17.8	16.4
41	24.5	24.3	24.1	23.8	23.4	23.0	22.5	21.8	21.1	20.1	19.1	17.8	16.4
42	24.5	24.3	24.1	23.8	23.4	23.0	22.5	21.8	21.1	20.1	19.1	17.8	16.4
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	47Ni-22Cr-19Fe-6Mo	Rod	SB-581	...	N06007	Solution ann.
2	47Ni-22Cr-19Fe-6Mo	Plate, sheet, strip	SB-582	...	N06007	Solution ann.
3	47Ni-22Cr-19Fe-6Mo	Wld. pipe	SB-619	...	N06007	Solution ann.
4	47Ni-22Cr-19Fe-6Mo	Smls. pipe & tube	SB-622	...	N06007	Solution ann.
5	47Ni-22Cr-19Fe-6Mo	Wld. tube	SB-626	...	N06007	Solution ann.
6	55Ni-21Cr-13.5Mo	Smls. & wld. fittings	SB-366	...	N06022	Solution ann.
7	55Ni-21Cr-13.5Mo	Forgings	SB-462	...	N06022	Solution ann.
8	55Ni-21Cr-13.5Mo	Forgings	SB-564	...	N06022	Solution ann.
9	55Ni-21Cr-13.5Mo	Rod	SB-574	...	N06022	Solution ann.
10	55Ni-21Cr-13.5Mo	Plate, sheet, strip	SB-575	...	N06022	Solution ann.
11	55Ni-21Cr-13.5Mo	Wld. pipe	SB-619	...	N06022	Solution ann.
12	55Ni-21Cr-13.5Mo	Smls. pipe & tube	SB-622	...	N06022	Solution ann.
13	55Ni-21Cr-13.5Mo	Wld. tube	SB-626	...	N06022	Solution ann.
14	60Ni-25Cr-9.5Fe-2.1Al	Smls. tube	SB-163	...	N06025	Annealed
15	60Ni-25Cr-9.5Fe-2.1Al	Plate, sheet, strip	SB-168	...	N06025	Annealed
16	60Ni-25Cr-9.5Fe-2.1Al	Wrought fittings	SB-366	...	N06025	Annealed
17	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-462	...	N06025	Annealed
18	60Ni-25Cr-9.5Fe-2.1Al	Wld. tube	SB-516	...	N06025	Annealed
19	60Ni-25Cr-9.5Fe-2.1Al	Wld. pipe	SB-517	...	N06025	Annealed
20	60Ni-25Cr-9.5Fe-2.1Al	Forgings	SB-564	...	N06025	Annealed
21	60Ni-25Cr-9.5Fe-2.1Al	Bar	SB-166	...	N06025	HW or CW ann.
22	60Ni-25Cr-9.5Fe-2.1Al	Smls. pipe & tube	SB-167	...	N06025	HW or CW ann.
23	40Ni-29Cr-15Fe-5Mo	Smls. & wld. fittings	SB-366	...	N06030	Solution ann.
24	40Ni-29Cr-15Fe-5Mo	Forgings	SB-462	...	N06030	Solution ann.
25	40Ni-29Cr-15Fe-5Mo	Rod	SB-581	...	N06030	Solution ann.
26	40Ni-29Cr-15Fe-5Mo	Plate, sheet, strip	SB-582	...	N06030	Solution ann.
27	40Ni-29Cr-15Fe-5Mo	Wld. pipe	SB-619	...	N06030	Solution ann.
28	40Ni-29Cr-15Fe-5Mo	Smls. pipe & tube	SB-622	...	N06030	Solution ann.
29	40Ni-29Cr-15Fe-5Mo	Wld. tube	SB-626	...	N06030	Solution ann.
30	58Ni-33Cr-8Mo	Smls. & wld. fittings	SB-366	...	N06035	Solution ann.
31	58Ni-33Cr-8Mo	Forgings	SB-462	...	N06035	Solution ann.
32	58Ni-33Cr-8Mo	Forgings	SB-564	...	N06035	Solution ann.
33	58Ni-33Cr-8Mo	Rod	SB-574	...	N06035	Solution ann.
34	58Ni-33Cr-8Mo	Plate, sheet, strip	SB-575	...	N06035	Solution ann.
35	58Ni-33Cr-8Mo	Wld. pipe	SB-619	...	N06035	Solution ann.
36	58Ni-33Cr-8Mo	Smls. pipe & tube	SB-622	...	N06035	Solution ann.
37	58Ni-33Cr-8Mo	Wld. tube	SB-626	...	N06035	Solution ann.
38	46Ni-27Cr-23Fe-2.75Si	Rod	SB-166	...	N06045	Solution ann.
39	46Ni-27Cr-23Fe-2.75Si	Smls. pipe & tube	SB-167	...	N06045	Solution ann.
40	46Ni-27Cr-23Fe-2.75Si	Plate, sheet, strip	SB-168	...	N06045	Solution ann.
41	46Ni-27Cr-23Fe-2.75Si	Smls. & wld. fittings	SB-366	...	N06045	Solution ann.
42	46Ni-27Cr-23Fe-2.75Si	Wld. tube	SB-516	...	N06045	Solution ann.
43	46Ni-27Cr-23Fe-2.75Si	Wld. pipe	SB-517	...	N06045	Solution ann.
44	46Ni-27Cr-23Fe-2.75Si	Forgings	SB-564	...	N06045	Solution ann.
45	59Ni-23Cr-16Mo	Fittings	SB-366	CR5923	N06059	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	$\leq \frac{3}{4}$	90	35	...
2	$\leq \frac{3}{4}$	90	35	...
3	...	90	35	...
4	...	90	35	...
5	...	90	35	...
6	...	100	45	...
7	...	100	45	...
8	...	100	45	...
9	...	100	45	...
10	...	100	45	...
11	...	100	45	...
12	...	100	45	...
13	...	100	45	...
14	...	98	39	...
15	...	98	39	...
16	...	98	39	...
17	$t \leq 4$	98	39	...
18	...	98	39	...
19	...	98	39	...
20	$t \leq 4$	98	39	...
21	$t \leq 4$	98	39	...
22	...	98	39	...
23	...	85	35	...
24	...	85	35	...
25	...	85	35	...
26	...	85	35	...
27	...	85	35	...
28	...	85	35	...
29	...	85	35	...
30	...	85	35	...
31	...	85	35	...
32	...	85	35	...
33	...	85	35	...
34	...	85	35	...
35	...	85	35	...
36	...	85	35	...
37	...	85	35	...
38	...	90	35	...
39	...	90	35	...
40	...	90	35	...
41	...	90	35	...
42	...	90	35	...
43	...	90	35	...
44	...	90	35	...
45	...	100	45	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	35.0	32.8	31.4	30.2	29.2	28.2	27.4	26.7	26.1
2	35.0	32.8	31.4	30.2	29.2	28.2	27.4	26.7	26.1
3	35.0	32.8	31.4	30.2	29.2	28.2	27.4	26.7	26.1
4	35.0	32.8	31.4	30.2	29.2	28.2	27.4	26.7	26.1
5	35.0	32.8	31.4	30.2	29.2	28.2	27.4	26.7	26.1
6	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
7	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
8	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
9	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
10	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
11	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
12	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
13	45.0	42.0	40.1	38.4	36.9	35.5	34.3	33.2	32.2
14	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
15	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
16	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
17	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
18	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
19	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
20	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
21	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
22	39.0	39.0	38.7	38.1	37.3	36.4	35.5	...	33.7
23	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
24	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
25	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
26	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
27	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
28	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
29	35.0	31.7	30.0	28.6	27.5	26.6	25.8	25.1	24.6
30	35.0	...	30.6	...	27.3	...	24.7	...	22.9
31	35.0	...	30.6	...	27.3	...	24.7	...	22.9
32	35.0	...	30.6	...	27.3	...	24.7	...	22.9
33	35.0	...	30.6	...	27.3	...	24.7	...	22.9
34	35.0	...	30.6	...	27.3	...	24.7	...	22.9
35	35.0	...	30.6	...	27.3	...	24.7	...	22.9
36	35.0	...	30.6	...	27.3	...	24.7	...	22.9
37	35.0	...	30.6	...	27.3	...	24.7	...	22.9
38	35.0	...	31.4	...	28.9	...	27.1	...	26.0
39	35.0	...	31.4	...	28.9	...	27.1	...	26.0
40	35.0	...	31.4	...	28.9	...	27.1	...	26.0
41	35.0	...	31.4	...	28.9	...	27.1	...	26.0
42	35.0	...	31.4	...	28.9	...	27.1	...	26.0
43	35.0	...	31.4	...	28.9	...	27.1	...	26.0
44	35.0	...	31.4	...	28.9	...	27.1	...	26.0
45	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	25.6	25.2	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.8
2	25.6	25.2	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.8
3	25.6	25.2	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.8
4	25.6	25.2	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.8
5	25.6	25.2	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.8
6	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
7	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
8	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
9	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
10	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
11	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
12	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
13	31.4	30.6	30.0	29.4	29.0	28.6	28.2	27.9	27.7	27.5
14	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
15	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
16	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
17	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
18	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
19	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
20	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
21	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
22	32.9	32.2	31.6	31.1	30.7	30.3	30.1	29.9	29.7	29.5
23	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
24	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
25	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
26	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
27	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
28	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
29	24.1	23.6	23.2	22.8	22.3	21.9	21.5	21.1	20.9	20.7
30	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
31	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
32	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
33	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
34	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
35	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
36	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
37	...	21.9	21.6	21.3	21.1	20.8	20.6	20.2	19.8	19.3
38	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
39	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
40	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
41	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
42	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
43	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
44	...	25.4	25.3	25.1	25.0	24.9	24.7	24.5	24.3	23.9
45	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
7	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
8	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
9	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
10	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
11	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
12	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
13	27.0	26.8	26.6	26.4	26.2	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	59Ni-23Cr-16Mo	Fittings	SB-366	WP5923	N06059	Annealed
2	59Ni-23Cr-16Mo	Wld. fittings	SB-366	WP5923W	N06059	Annealed
3	59Ni-23Cr-16Mo	Fittings	SB-366	WP5923WX	N06059	Annealed
4	59Ni-23Cr-16Mo	Forged fittings	SB-462	...	N06059	Solution ann.
5	59Ni-23Cr-16Mo	Forgings	SB-564	...	N06059	Solution ann.
6	59Ni-23Cr-16Mo	Rod	SB-574	...	N06059	Solution ann.
7	59Ni-23Cr-16Mo	Plate, sheet, strip	SB-575	...	N06059	Solution ann.
8	59Ni-23Cr-16Mo	Wld. pipe	SB-619	...	N06059	Solution ann.
9	59Ni-23Cr-16Mo	Smls. pipe & tube	SB-622	...	N06059	Solution ann.
10	59Ni-23Cr-16Mo	Wld. tube	SB-626	...	N06059	Solution ann.
11	59Ni-23Cr-16Mo-1.6Cu	Fittings	SB-366	...	N06200	Solution ann.
12	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-462	...	N06200	Solution ann.
13	59Ni-23Cr-16Mo-1.6Cu	Forgings	SB-564	...	N06200	Solution ann.
14	59Ni-23Cr-16Mo-1.6Cu	Rod	SB-574	...	N06200	Solution ann.
15	59Ni-23Cr-16Mo-1.6Cu	Plate, sheet, strip	SB-575	...	N06200	Solution ann.
16	59Ni-23Cr-16Mo-1.6Cu	Wld. pipe	SB-619	...	N06200	Solution ann.
17	59Ni-23Cr-16Mo-1.6Cu	Smls. pipe & tube	SB-622	...	N06200	Solution ann.
18	59Ni-23Cr-16Mo-1.6Cu	Wld. tube	SB-626	...	N06200	Solution ann.
19	60Ni-19Cr-19Mo-1.8Ta	Smls. & wld. fittings	SB-366	...	N06210	Solution ann.
20	60Ni-19Cr-19Mo-1.8Ta	Forgings	SB-564	...	N06210	Solution ann.
21	60Ni-19Cr-19Mo-1.8Ta	Rod	SB-574	...	N06210	Solution ann.
22	60Ni-19Cr-19Mo-1.8Ta	Plate, sheet, strip	SB-575	...	N06210	Solution ann.
23	60Ni-19Cr-19Mo-1.8Ta	Wld. pipe	SB-619	...	N06210	Solution ann.
24	60Ni-19Cr-19Mo-1.8Ta	Smls. pipe & tube	SB-622	...	N06210	Solution ann.
25	60Ni-19Cr-19Mo-1.8Ta	Wld. tube	SB-626	...	N06210	Solution ann.
26	57Ni-22Cr-14W-2Mo-La	Plate, sheet, strip	SB-435	...	N06230	Solution ann.
27	57Ni-22Cr-14W-2Mo-La	Forgings	SB-564	...	N06230	Solution ann.
28	57Ni-22Cr-14W-2Mo-La	Bar	SB-572	...	N06230	Solution ann.
29	57Ni-22Cr-14W-2Mo-La	Wld. pipe	SB-619	...	N06230	Solution ann.
30	57Ni-22Cr-14W-2Mo-La	Smls. pipe & tube	SB-622	...	N06230	Solution ann.
31	57Ni-22Cr-14W-2Mo-La	Wld. tube	SB-626	...	N06230	Solution ann.
32	61Ni-16Mo-16Cr	Smls. & wld. fittings	SB-366	...	N06455	Annealed
33	61Ni-16Mo-16Cr	Rod	SB-574	...	N06455	Solution ann.
34	61Ni-16Mo-16Cr	Plate, sheet, strip	SB-575	...	N06455	Solution ann.
35	61Ni-16Mo-16Cr	Wld. pipe	SB-619	...	N06455	Solution ann.
36	61Ni-16Mo-16Cr	Smls. pipe & tube	SB-622	...	N06455	Solution ann.
37	61Ni-16Mo-16Cr	Wld. tube	SB-626	...	N06455	Solution ann.
38	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
39	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
40	72Ni-15Cr-8Fe	Smls. & wld. fittings	SB-366	...	N06600	Annealed
41	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Cold drawn/ann.
42	72Ni-15Cr-8Fe	Smls. pipe & tube	SB-167	...	N06600	Hot fin./ann.
43	72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	Annealed
44	72Ni-15Cr-8Fe	Bar	SB-166	...	N06600	Annealed
45	72Ni-15Cr-8Fe	Plate	SB-168	...	N06600	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	100	45	...
2	...	100	45	...
3	...	100	45	...
4	...	100	45	...
5	...	100	45	...
6	...	100	45	...
7	...	100	45	...
8	...	100	45	...
9	...	100	45	...
10	...	100	45	...
11	...	100	45	...
12	...	100	45	...
13	...	100	45	...
14	...	100	45	...
15	...	100	45	...
16	...	100	45	...
17	...	100	45	...
18	...	100	45	...
19	...	100	45	...
20	...	100	45	...
21	...	100	45	...
22	...	100	45	...
23	...	100	45	...
24	...	100	45	...
25	...	100	45	...
26	...	110	45	...
27	...	110	45	...
28	...	110	45	...
29	...	110	45	...
30	...	110	45	...
31	...	110	45	...
32	...	100	40	...
33	...	100	40	...
34	...	100	40	...
35	...	100	40	...
36	...	100	40	...
37	...	100	40	...
38	>5	75	25	...
39	>5	80	30	...
40	...	80	30	...
41	>5	80	30	...
42	<5	80	30	...
43	≤3	80	35	...
44	...	80	35	...
45	...	80	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
2	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
3	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
4	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
5	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
6	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
7	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
8	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
9	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
10	45.0	42.8	40.4	39.1	37.8	36.9	35.8	34.8	33.9
11	45.0	...	40.4	...	37.2	...	34.3	...	31.8
12	45.0	...	40.4	...	37.2	...	34.3	...	31.8
13	45.0	...	40.4	...	37.2	...	34.3	...	31.8
14	45.0	...	40.4	...	37.2	...	34.3	...	31.8
15	45.0	...	40.4	...	37.2	...	34.3	...	31.8
16	45.0	...	40.4	...	37.2	...	34.3	...	31.8
17	45.0	...	40.4	...	37.2	...	34.3	...	31.8
18	45.0	...	40.4	...	37.2	...	34.3	...	31.8
19	45.0	...	40.0	...	36.8	...	33.9	...	31.4
20	45.0	...	40.0	...	36.8	...	33.9	...	31.4
21	45.0	...	40.0	...	36.8	...	33.9	...	31.4
22	45.0	...	40.0	...	36.8	...	33.9	...	31.4
23	45.0	...	40.0	...	36.8	...	33.9	...	31.4
24	45.0	...	40.0	...	36.8	...	33.9	...	31.4
25	45.0	...	40.0	...	36.8	...	33.9	...	31.4
26	45.0	...	42.3	...	39.6	...	37.0	...	34.7
27	45.0	...	42.3	...	39.6	...	37.0	...	34.7
28	45.0	...	42.3	...	39.6	...	37.0	...	34.7
29	45.0	...	42.3	...	39.6	...	37.0	...	34.7
30	45.0	...	42.3	...	39.6	...	37.0	...	34.7
31	45.0	...	42.3	...	39.6	...	37.0	...	34.7
32	40.0	38.2	36.9	35.6	34.5	33.5	32.6	31.8	31.2
33	40.0	38.2	36.9	35.6	34.5	33.5	32.6	31.8	31.2
34	40.0	38.2	36.9	35.6	34.5	33.5	32.6	31.8	31.2
35	40.0	38.2	36.9	35.6	34.5	33.5	32.6	31.8	31.2
36	40.0	38.2	36.9	35.6	34.5	33.5	32.6	31.8	31.2
37	40.0	38.2	36.9	35.6	34.5	33.5	32.6	31.8	31.2
38	25.0	24.3	23.8	23.3	22.8	22.3	21.9	21.4	21.0
39	30.0	29.2	28.6	28.0	27.4	26.8	26.2	25.7	25.2
40	30.0	29.2	28.6	28.0	27.4	26.8	26.2	25.7	25.2
41	30.0	29.2	28.6	28.0	27.4	26.8	26.2	25.7	25.2
42	30.0	29.2	28.6	28.0	27.4	26.8	26.2	25.7	25.2
43	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3
44	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3
45	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
2	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
3	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
4	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
5	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
6	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
7	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
8	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
9	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
10	33.0	32.1	31.2	30.3	29.4	28.6	27.8	27.0	26.3	25.7
11	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
12	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
13	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
14	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
15	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
16	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
17	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
18	...	29.8	29.1	28.6	28.2	28.0	27.8	27.6	27.2	26.4
19	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
20	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
21	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
22	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
23	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
24	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
25	...	29.3	28.4	27.5	26.8	26.2	25.7	25.2	24.9	24.7
26	...	32.9	32.3	31.9	31.6	31.4	31.3	31.3	31.3	31.3
27	...	32.9	32.3	31.9	31.6	31.4	31.3	31.3	31.3	31.3
28	...	32.9	32.3	31.9	31.6	31.4	31.3	31.3	31.3	31.3
29	...	32.9	32.3	31.9	31.6	31.4	31.3	31.3	31.3	31.3
30	...	32.9	32.3	31.9	31.6	31.4	31.3	31.3	31.3	31.3
31	...	32.9	32.3	31.9	31.6	31.4	31.3	31.3	31.3	31.3
32	30.6	30.2	29.8	29.4	29.0	28.7	28.3	27.9	27.6	27.3
33	30.6	30.2	29.8	29.4	29.0	28.7	28.3	27.9	27.6	27.3
34	30.6	30.2	29.8	29.4	29.0	28.7	28.3	27.9	27.6	27.3
35	30.6	30.2	29.8	29.4	29.0	28.7	28.3	27.9	27.6	27.3
36	30.6	30.2	29.8	29.4	29.0	28.7	28.3	27.9	27.6	27.3
37	30.6	30.2	29.8	29.4	29.0	28.7	28.3	27.9	27.6	27.3
38	20.6	20.3	19.9	19.6	19.3	19.1	18.8	18.6	18.5	18.3
39	24.7	24.3	23.9	23.5	23.2	22.9	22.6	22.3	22.2	21.9
40	24.7	24.3	23.9	23.5	23.2	22.9	22.6	22.3	22.2	21.9
41	24.7	24.3	23.9	23.5	23.2	22.9	22.6	22.3	22.2	21.9
42	24.7	24.3	23.9	23.5	23.2	22.9	22.6	22.3	22.2	21.9
43	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3
44	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3
45	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	18.0	17.6	17.2	16.7	...	...	...	...	...	...	...	...	...
39	21.6	21.1	20.6	20.1	...	...	...	...	...	...	...	...	...
40	21.6	21.1	20.6	20.1	...	...	...	...	...	...	...	...	...
41	21.6	21.1	20.6	20.1	...	...	...	...	...	...	...	...	...
42	21.6	21.1	20.6	20.1	...	...	...	...	...	...	...	...	...
43	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...
44	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...
45	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
(23)	1 72Ni-15Cr-8Fe	Wld. tube	SB-516	...	N06600	Annealed
	2 72Ni-15Cr-8Fe	Forgings	SB-564	...	N06600	...
	3 72Ni-15Cr-8Fe	Pipe, tube	SB-167	...	N06600	Cold drawn/ann.
	4 72Ni-15Cr-8Fe	Wld. pipe	SB-517	...	N06600	Cold drawn/ann.
	5 72Ni-15Cr-8Fe	Smls. tube	SB-163	...	N06600	...
	6 72Ni-15Cr-8Fe	Bar, rod	SB-166	...	N06600	Hot worked
	7 72Ni-15Cr-8Fe	Plate, sheet, strip	SB-168	...	N06600	Hot rolled
	8 72Ni-15Cr-8Fe	Rounds	SB-166	...	N06600	Hot worked
	9 72Ni-15Cr-8Fe	Rounds	SB-166	...	N06600	Hot worked
	10 60Ni-23Cr-Fe	Smls. tube	SB-163	...	N06601	Annealed
(23)	11 60Ni-23Cr-Fe	Bar	SB-166	...	N06601	Annealed
	12 60Ni-23Cr-Fe	Smls. pipe & tube	SB-167	...	N06601	Annealed
	13 60Ni-23Cr-Fe	Plate, sheet, strip	SB-168	...	N06601	Annealed
	14 52Ni-22Cr-13Co-9Mo	Bar, rod	SB-166	...	N06617	Annealed
	15 52Ni-22Cr-13Co-9Mo	Smls. pipe & tube	SB-167	...	N06617	Annealed
	16 52Ni-22Cr-13Co-9Mo	Plate, sheet, strip	SB-168	...	N06617	Annealed
	17 52Ni-22Cr-13Co-9Mo	Forgings	SB-564	...	N06617	Annealed
	18 52Ni-22Cr-13Co-9Mo	Wld. tube	SB-626	...	N06617	Solution ann.
	(23) 19 60Ni-22Cr-9Mo-3.5Cb	Plate, sheet, strip	SB-443	2	N06625	Solution ann.
	(23) 20 60Ni-22Cr-9Mo-3.5Cb	Plate, sheet	SB-443	2	N06625	Hot rolled/sol. ann.
(23)	21 60Ni-22Cr-9Mo-3.5Cb	Smls. pipe & tube	SB-444	2	N06625	Solution ann.
	22 60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	2	N06625	Solution ann.
	23 60Ni-22Cr-9Mo-3.5Cb	Smls. & wld. fittings	SB-366	...	N06625	Annealed
	24 60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	1	N06625	Annealed
	25 60Ni-22Cr-9Mo-3.5Cb	Forgings	SB-564	...	N06625	Annealed
	(23) 26 60Ni-22Cr-9Mo-3.5Cb	Plate, sheet, strip	SB-443	1	N06625	Annealed
	(23) 27 60Ni-22Cr-9Mo-3.5Cb	Plate, sheet	SB-443	1	N06625	Hot rolled/ann.
	(23) 28 60Ni-22Cr-9Mo-3.5Cb	Plate, sheet, strip	SB-443	1	N06625	Annealed
	(23) 29 60Ni-22Cr-9Mo-3.5Cb	Smls. pipe	SB-444	1	N06625	Annealed
	(23) 30 60Ni-22Cr-9Mo-3.5Cb	Bar	SB-446	1	N06625	Annealed
(23)	31 60Ni-22Cr-9Mo-3.5Cb	Forgings	SB-564	...	N06625	Annealed
	(23) 32 60Ni-22Cr-9Mo-3.5Cb	Wld. tube	SB-704	...	N06625	Annealed
	(23) 33 60Ni-22Cr-9Mo-3.5Cb	Wld. pipe	SB-705	...	N06625	Annealed
	34 Ni-Cr-Mo-W	Forgings	SB-564	...	N06686	Solution ann.
	35 Ni-Cr-Mo-W	Rod	SB-574	...	N06686	Solution ann.
	36 Ni-Cr-Mo-W	Plate, sheet, strip	SB-575	...	N06686	Solution ann.
	37 Ni-Cr-Mo-W	Wld. pipe	SB-619	...	N06686	Solution ann.
	38 Ni-Cr-Mo-W	Smls. pipe & tube	SB-622	...	N06686	Solution ann.
	39 Ni-Cr-Mo-W	Wld. tube	SB-626	...	N06686	Solution ann.
	40 58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Hot worked/ann.
(23)	41 58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold worked/ann.
	42 58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Hot worked/ann.
	43 58Ni-29Cr-9Fe	Smls. tube	SB-163	...	N06690	Annealed
	44 58Ni-29Cr-9Fe	Bar, rod	SB-166	...	N06690	Annealed
	45 58Ni-29Cr-9Fe	Plate, sheet, strip	SB-168	...	N06690	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	80	35	...
2	...	80	35	...
3	≤ 5	80	35	...
4	...	80	35	...
5	...	80	40	...
6	> 3	85	35	...
7	...	85	35	...
8	$\frac{1}{2} < t \leq 3$	90	40	...
9	$\frac{1}{4} \leq t \leq \frac{1}{2}$	95	45	...
10	≤ 3 O.D.	80	30	...
11	...	80	30	...
12	...	80	30	...
13	...	80	30	...
14	...	95	35	...
15	...	95	35	...
16	...	95	35	...
17	...	95	35	...
18	...	95	35	...
19	...	100	40	...
20	...	100	40	...
21	...	100	40	...
22	...	100	40	...
23	...	110	50	...
24	$4 < t \leq 10$	110	50	...
25	$4 < t \leq 10$	110	50	...
26	...	110	55	...
27	≤ 2.75	110	55	...
28	...	120	60	...
29	...	120	60	...
30	≤ 4	120	60	...
31	≤ 4	120	60	...
32	...	120	60	...
33	...	120	60	...
34	...	100	45	...
35	...	100	45	...
36	...	100	45	...
37	≤ 8	100	45	...
38	...	100	45	...
39	$\leq 3\frac{1}{2}$	100	45	...
40	> 5 O.D.	75	25	...
41	> 5 O.D.	85	30	...
42	≤ 5 O.D.	85	30	...
43	...	85	35	...
44	...	85	35	...
45	...	85	35	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3
2	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3
3	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3
4	35.0	32.8	32.0	31.5	31.2	30.9	30.7	30.5	30.3
5	40.0	...	36.6	...	35.6	...	35.1	...	34.7
6	35.0	33.8	33.2	32.7	32.3	32.1	31.9	31.9	31.9
7	35.0	33.8	33.2	32.7	32.3	32.1	31.9	31.9	31.9
8	40.0	...	38.0	...	37.0	...	36.4	...	36.4
9	45.0	...	42.8	...	41.7	...	41.0	...	40.9
10	30.0	27.8	26.8	25.8	24.9	24.0	23.3	22.7	22.1
11	30.0	27.8	26.8	25.8	24.9	24.0	23.3	22.7	22.1
12	30.0	27.8	26.8	25.8	24.9	24.0	23.3	22.7	22.1
13	30.0	27.8	26.8	25.8	24.9	24.0	23.3	22.7	22.1
14	35.0	...	31.1	...	28.9	...	27.1	...	25.9
15	35.0	...	31.1	...	28.9	...	27.1	...	25.9
16	35.0	...	31.1	...	28.9	...	27.1	...	25.9
17	35.0	...	31.1	...	28.9	...	27.1	...	25.9
18	35.0	...	31.1	...	28.9	...	27.1	...	25.9
19	40.0	37.7	36.4	35.2	34.2	33.2	32.4	31.7	31.1
20	40.0	38.0	36.9	36.0	35.1	34.3	33.7	33.0	32.5
21	40.0	37.7	36.4	35.2	34.2	33.2	32.4	31.7	31.1
22	40.0	37.7	36.4	35.2	34.2	33.2	32.4	31.7	31.1
23	50.0	45.6	43.3	41.3	39.7	38.3	37.3	36.4	35.8
24	50.0	45.6	43.3	41.3	39.7	38.3	37.3	36.4	35.8
25	50.0	45.6	43.3	41.3	39.7	38.3	37.3	36.4	35.8
26	55.0	50.1	47.6	45.5	43.7	42.2	41.0	40.1	39.4
27	55.0	53.8	53.0	52.2	51.4	50.7	49.9	49.2	48.5
28	60.0	54.7	51.9	49.6	47.6	46.0	44.7	43.7	43.0
29	60.0	54.7	51.9	49.6	47.6	46.0	44.7	43.7	43.0
30	60.0	54.7	51.9	49.6	47.6	46.0	44.7	43.7	43.0
31	60.0	54.7	51.9	49.6	47.6	46.0	44.7	43.7	43.0
32	60.0	54.7	51.9	49.6	47.6	46.0	44.7	43.7	43.0
33	60.0	54.7	51.9	49.6	47.6	46.0	44.7	43.7	43.0
34	45.0	39.5	37.3	36.0	35.1	34.3	33.7	33.1	32.5
35	45.0	39.5	37.3	36.0	35.1	34.3	33.7	33.1	32.5
36	45.0	39.5	37.3	36.0	35.1	34.3	33.7	33.1	32.5
37	45.0	39.5	37.3	36.0	35.1	34.3	33.7	33.1	32.5
38	45.0	39.5	37.3	36.0	35.1	34.3	33.7	33.1	32.5
39	45.0	39.5	37.3	36.0	35.1	34.3	33.7	33.1	32.5
40	25.0	23.6	22.7	22.0	21.3	20.8	20.4	20.1	19.9
41	30.0	28.3	27.3	26.4	25.6	25.0	24.5	24.1	23.9
42	30.0	28.3	27.3	26.4	25.6	25.0	24.5	24.1	23.9
43	35.0	32.9	31.7	30.7	29.8	29.1	28.6	28.2	27.9
44	35.0	32.9	31.7	30.7	29.8	29.1	28.6	28.2	27.9
45	35.0	32.9	31.7	30.7	29.8	29.1	28.6	28.2	27.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3
2	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3
3	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3
4	30.1	29.9	29.7	29.4	29.1	28.7	28.1	27.3	26.1	25.3
5	...	34.2	33.9	33.6	33.2	32.8	...	...	...	...
6	31.9	31.8	31.7	31.5	31.2	30.7	30.1	29.5	28.9	28.1
7	31.9	31.8	31.7	31.5	31.2	30.7	30.1	29.5	28.9	28.1
8	...	36.4	36.1	35.9	35.4	34.8	...	...	...	...
9	...	40.9	40.6	40.4	39.8	39.1	...	...	...	...
10	21.7	21.3	21.1	20.9	20.8	20.7	20.6	20.6	20.6	20.6
11	21.7	21.3	21.1	20.9	20.8	20.7	20.6	20.6	20.6	20.6
12	21.7	21.3	21.1	20.9	20.8	20.7	20.6	20.6	20.6	20.6
13	21.7	21.3	21.1	20.9	20.8	20.7	20.6	20.6	20.6	20.6
14	...	25.0	24.6	24.3	24.1	23.8	23.7	23.5	23.4	23.3
15	...	25.0	24.6	24.3	24.1	23.8	23.7	23.5	23.4	23.3
16	...	25.0	24.6	24.3	24.1	23.8	23.7	23.5	23.4	23.3
17	...	25.0	24.6	24.3	24.1	23.8	23.7	23.5	23.4	23.3
18	...	25.0	24.6	24.3	24.1	23.8	23.7	23.5	23.4	23.3
19	30.5	30.1	29.7	29.4	29.2	29.1	29.0	28.9	28.8	28.8
20	32.0	31.5	31.2	30.8	30.5	30.2	30.0	29.7	29.6	29.4
21	30.5	30.1	29.7	29.4	29.2	29.1	29.0	28.9	28.8	28.8
22	30.5	30.1	29.7	29.4	29.2	29.1	29.0	28.9	28.8	28.8
23	35.4	35.1	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
24	35.4	35.1	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
25	35.4	35.1	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
26	38.9	38.6	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5
27	47.9	47.2	46.6	46.1	45.6	45.2	44.8	44.5	44.2	43.9
28	42.5	42.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
29	42.5	42.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
30	42.5	42.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
31	42.5	42.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
32	42.5	42.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
33	42.5	42.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
34	31.8	31.2	30.6	30.2	29.9	29.8	29.8	29.8	29.8	29.4
35	31.8	31.2	30.6	30.2	29.9	29.8	29.8	29.8	29.8	29.4
36	31.8	31.2	30.6	30.2	29.9	29.8	29.8	29.8	29.8	29.4
37	31.8	31.2	30.6	30.2	29.9	29.8	29.8	29.8	29.8	29.4
38	31.8	31.2	30.6	30.2	29.9	29.8	29.8	29.8	29.8	29.4
39	31.8	31.2	30.6	30.2	29.9	29.8	29.8	29.8	29.8	29.4
40	19.8	19.7	19.7	19.7	19.7	19.7	19.6	19.6	19.5	19.4
41	23.7	23.6	23.6	23.6	23.6	23.6	23.6	23.5	23.4	23.3
42	23.7	23.6	23.6	23.6	23.6	23.6	23.6	23.5	23.4	23.3
43	27.7	27.6	27.5	27.5	27.5	27.5	27.5	27.5	27.4	27.1
44	27.7	27.6	27.5	27.5	27.5	27.5	27.5	27.5	27.4	27.1
45	27.7	27.6	27.5	27.5	27.5	27.5	27.5	27.5	27.4	27.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...
2	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...
3	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...
4	24.3	23.2	21.9	20.5	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	(23)
6	27.4	26.6	25.6	24.4	...	...	...	...	...	...	...	...	...
7	27.4	26.6	25.6	24.4	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	(23)
19	28.7	28.7	28.6	28.5	28.3	28.1	27.8	27.4	26.8	26.1	25.3	24.3	(23)
20	...	...	...	...	...	...	...	...	...	...	...	...	(23)
21	28.7	28.7	28.6	28.5	28.3	28.1	27.8	27.4	26.8	26.1	25.3	24.3	...
22	28.7	28.7	28.6	28.5	28.3	28.1	27.8	27.4	26.8	26.1	25.3	24.3	...
23	35.0	35.0	35.0	35.0	35.0	35.0	35.0	34.5	33.5	32.2	30.6	28.6	...
24	35.0	35.0	35.0	35.0	35.0	35.0	35.0	34.5	33.5	32.2	30.6	28.6	...
25	35.0	35.0	35.0	35.0	35.0	35.0	35.0	34.5	33.5	32.2	30.6	28.6	...
26	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.0	36.8	35.4	33.6	31.5	(23)
27	...	...	...	...	...	...	...	...	...	...	...	...	(23)
28	42.1	42.1	42.1	42.1	42.1	42.1	42.1	41.4	40.2	38.6	36.7	34.4	(23)
29	42.1	42.1	42.1	42.1	42.1	42.1	42.1	41.4	40.2	38.6	36.7	34.4	(23)
30	42.1	42.1	42.1	42.1	42.1	42.1	42.1	41.4	40.2	38.6	36.7	34.4	(23)
31	42.1	42.1	42.1	42.1	42.1	42.1	42.1	41.4	40.2	38.6	36.7	34.4	(23)
32	42.1	42.1	42.1	42.1	42.1	42.1	42.1	41.4	40.2	38.6	36.7	34.4	(23)
33	42.1	42.1	42.1	42.1	42.1	42.1	42.1	41.4	40.2	38.6	36.7	34.4	(23)
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	58Ni-29Cr-9Fe	Forgings	SB-564	...	N06690	Annealed
2	58Ni-29Cr-9Fe	Smls. pipe & tube	SB-167	...	N06690	Cold worked/ann.
3	58Ni-29Cr-9Fe	Smls. tube	SB-163	...	N06690	Annealed
4	49Ni-25Cr-18Fe-6Mo	Bolting	SB-581	...	N06975	Solution ann.
5	49Ni-25Cr-18Fe-6Mo	Plate, sheet, strip	SB-582	...	N06975	Solution ann.
6	49Ni-25Cr-18Fe-6Mo	Wld. pipe	SB-619	...	N06975	Solution ann.
7	49Ni-25Cr-18Fe-6Mo	Smls. pipe & tube	SB-622	...	N06975	Solution ann.
8	49Ni-25Cr-18Fe-6Mo	Wld. tube	SB-626	...	N06975	Solution ann.
9	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed
10	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed
11	47Ni-22Cr-20Fe-7Mo	Smls. & wld. fittings	SB-366	...	N06985	Annealed
12	47Ni-22Cr-20Fe-7Mo	Rod	SB-581	...	N06985	Annealed
13	47Ni-22Cr-20Fe-7Mo	Plate, sheet, strip	SB-582	...	N06985	Annealed
14	47Ni-22Cr-20Fe-7Mo	Wld. pipe	SB-619	...	N06985	Annealed
15	47Ni-22Cr-20Fe-7Mo	Smls. pipe & tube	SB-622	...	N06985	Annealed
16	47Ni-22Cr-20Fe-7Mo	Wld. tube	SB-626	...	N06985	Annealed
17	35Ni-35Fe-20Cr-Cb	Forgings	SB-462	...	N08020	Annealed
18	35Ni-35Fe-20Cr-Cb	Plate	SB-463	...	N08020	Annealed
19	35Ni-35Fe-20Cr-Cb	Bar	SB-473	...	N08020	Annealed
20	35Ni-35Fe-20Cr-Cb	Smls. pipe & tube	SB-729	...	N08020	Annealed
21	35Ni-35Fe-20Cr-Cb	Wld. pipe	SB-464	...	N08020	Wld. ann.
22	35Ni-35Fe-20Cr-Cb	Wld. tube	SB-468	...	N08020	Wld. ann.
23	35Ni-35Fe-20Cr-Cb	Smls. & wld. fittings	SB-366	...	N08020	Annealed
24	37Ni-33Fe-23Cr-4Mo-Cu	Wld. pipe	SB-464	...	N08024	Wld. ann.
25	37Ni-33Fe-23Cr-4Mo-Cu	Wld. tube	SB-468	...	N08024	Wld. ann.
26	35Ni-30Fe-24Cr-6Mo-Cu	Wld. pipe	SB-464	...	N08026	Wld. ann.
27	35Ni-30Fe-24Cr-6Mo-Cu	Wld. tube	SB-468	...	N08026	Wld. ann.
28	31Ni-31Fe-29Cr-Mo	Smls. tube	SB-668	...	N08028	Annealed
29	31Ni-31Fe-29Cr-Mo	Plate, sheet, strip	SB-709	...	N08028	Annealed
30	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. & wld. fittings	SB-366	...	N08031	Solution ann.
31	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Forgings	SB-564	...	N08031	Solution ann.
32	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Rod	SB-581	...	N08031	Solution ann.
33	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. pipe	SB-619	...	N08031	Solution ann.
34	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Smls. pipe & tube	SB-622	...	N08031	Solution ann.
35	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08031	Solution ann.
36	31Ni-33Fe-27Cr-6.5Mo-Cu-N	Wld. tube	SB-626	...	N08031	Solution ann.
37	37Ni-33Fe-25Cr	Condenser tube	SB-163	...	N08120	Solution ann.
38	37Ni-33Fe-25Cr	Smls. & wld. fittings	SB-366	...	N08120	Solution ann.
39	37Ni-33Fe-25Cr	Smls. pipe & tube	SB-407	...	N08120	Solution ann.
40	37Ni-33Fe-25Cr	Bar, rod	SB-408	...	N08120	Solution ann.
41	37Ni-33Fe-25Cr	Plate, sheet, strip	SB-409	...	N08120	Solution ann.
42	37Ni-33Fe-25Cr	Wld. pipe	SB-514	...	N08120	Solution ann.
43	37Ni-33Fe-25Cr	Wld. tube	SB-515	...	N08120	Solution ann.
44	37Ni-33Fe-25Cr	Forgings	SB-564	...	N08120	Solution ann.
45	26Ni-43Fe-22Cr-5Mo	Wld. pipe	SB-619	...	N08320	Solution ann.

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	85	35	...
2	≤5 O.D.	85	35	...
3	...	85	40	...
4	...	85	32	...
5	...	85	32	...
6	...	85	32	...
7	...	85	32	...
8	...	85	32	...
9	> ³ / ₄	85	30	...
10	> ³ / ₄	85	30	...
11	...	90	35	...
12	≤ ³ / ₄	90	35	...
13	≤ ³ / ₄	90	35	...
14	...	90	35	...
15	...	90	35	...
16	...	90	35	...
17	...	80	35	...
18	...	80	35	...
19	...	80	35	...
20	...	80	35	...
21	...	80	35	...
22	...	80	35	...
23	...	85	40	...
24	...	80	35	...
25	...	80	35	...
26	...	80	35	...
27	...	80	35	...
28	...	73	31	...
29	...	73	31	...
30	...	94	40	...
31	...	94	40	...
32	...	94	40	...
33	...	94	40	...
34	...	94	40	...
35	...	94	40	...
36	...	94	40	...
37	...	90	40	...
38	...	90	40	...
39	...	90	40	...
40	...	90	40	...
41	...	90	40	...
42	...	90	40	...
43	...	90	40	...
44	...	90	40	...
45	...	75	28	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	35.0	32.9	31.7	30.7	29.8	29.1	28.6	28.2	27.9
2	35.0	33.0	31.8	30.8	29.9	29.1	28.5	28.1	27.8
3	40.0	...	36.2	...	34.1	...	32.7	...	31.9
4	32.0	30.2	29.3	28.5	27.7	27.0	26.2	25.5	24.8
5	32.0	30.2	29.3	28.5	27.7	27.0	26.2	25.5	24.8
6	32.0	30.2	29.3	28.5	27.7	27.0	26.2	25.5	24.8
7	32.0	30.2	29.3	28.5	27.7	27.0	26.2	25.5	24.8
8	32.0	30.2	29.3	28.5	27.7	27.0	26.2	25.5	24.8
9	30.0	28.0	26.7	25.5	24.3	23.3	22.4	21.5	20.8
10	30.0	28.0	26.7	25.5	24.3	23.3	22.4	21.5	20.8
11	35.0	32.7	31.2	29.7	28.4	27.2	26.1	25.1	24.3
12	35.0	32.7	31.2	29.7	28.4	27.2	26.1	25.1	24.3
13	35.0	32.7	31.2	29.7	28.4	27.2	26.1	25.1	24.3
14	35.0	32.7	31.2	29.7	28.4	27.2	26.1	25.1	24.3
15	35.0	32.7	31.2	29.7	28.4	27.2	26.1	25.1	24.3
16	35.0	32.7	31.2	29.7	28.4	27.2	26.1	25.1	24.3
17	35.0	32.0	30.9	30.2	29.6	29.0	28.4	27.8	27.3
18	35.0	32.0	30.9	30.2	29.6	29.0	28.4	27.8	27.3
19	35.0	32.0	30.9	30.2	29.6	29.0	28.4	27.8	27.3
20	35.0	32.0	30.9	30.2	29.6	29.0	28.4	27.8	27.3
21	35.0	32.0	30.9	30.2	29.6	29.0	28.4	27.8	27.3
22	35.0	32.0	30.9	30.2	29.6	29.0	28.4	27.8	27.3
23	40.0	36.6	35.4	34.5	33.8	33.1	32.5	31.8	31.2
24	35.0	32.2	30.9	29.8	28.8	28.0	27.2	26.3	25.5
25	35.0	32.2	30.9	29.8	28.8	28.0	27.2	26.3	25.5
26	35.0	32.6	31.1	29.7	28.4	27.3	26.3	25.3	24.4
27	35.0	32.6	31.1	29.7	28.4	27.3	26.3	25.3	24.4
28	31.0	29.4	28.4	27.4	26.5	25.6	24.8	23.9	23.2
29	31.0	29.4	28.4	27.4	26.5	25.6	24.8	23.9	23.2
30	40.0	...	33.0	...	29.7	...	27.4	...	25.9
31	40.0	...	33.0	...	29.7	...	27.4	...	25.9
32	40.0	...	33.0	...	29.7	...	27.4	...	25.9
33	40.0	...	33.0	...	29.7	...	27.4	...	25.9
34	40.0	...	33.0	...	29.7	...	27.4	...	25.9
35	40.0	...	33.0	...	29.7	...	27.4	...	25.9
36	40.0	...	33.0	...	29.7	...	27.4	...	25.9
37	40.0	...	35.3	...	32.3	...	29.9	...	27.9
38	40.0	...	35.3	...	32.3	...	29.9	...	27.9
39	40.0	...	35.3	...	32.3	...	29.9	...	27.9
40	40.0	...	35.3	...	32.3	...	29.9	...	27.9
41	40.0	...	35.3	...	32.3	...	29.9	...	27.9
42	40.0	...	35.3	...	32.3	...	29.9	...	27.9
43	40.0	...	35.3	...	32.3	...	29.9	...	27.9
44	40.0	...	35.3	...	32.3	...	29.9	...	27.9
45	28.0	26.7	25.9	25.2	24.5	23.8	23.1	22.4	21.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)										
1	27.7	27.6	27.5	27.5	27.5	27.5	27.5	27.5	27.4	27.1
2	27.7	27.6	27.5	27.5	27.5	27.5	27.5	27.4	27.3	27.2
3	...	31.5	31.5	31.5	31.5	31.5	...	...	...	...
4	24.1	23.4	22.9	22.5	22.2	22.0	21.9	21.9	21.9	21.9
5	24.1	23.4	22.9	22.5	22.2	22.0	21.9	21.9	21.9	21.9
6	24.1	23.4	22.9	22.5	22.2	22.0	21.9	21.9	21.9	21.9
7	24.1	23.4	22.9	22.5	22.2	22.0	21.9	21.9	21.9	21.9
8	24.1	23.4	22.9	22.5	22.2	22.0	21.9	21.9	21.9	21.9
9	20.2	19.7	19.2	18.8	18.4	18.0	17.6	17.3	17.0	16.7
10	20.2	19.7	19.2	18.8	18.4	18.0	17.6	17.3	17.0	16.7
11	23.6	23.0	22.4	21.9	21.4	21.0	20.6	20.2	19.8	19.5
12	23.6	23.0	22.4	21.9	21.4	21.0	20.6	20.2	19.8	19.5
13	23.6	23.0	22.4	21.9	21.4	21.0	20.6	20.2	19.8	19.5
14	23.6	23.0	22.4	21.9	21.4	21.0	20.6	20.2	19.8	19.5
15	23.6	23.0	22.4	21.9	21.4	21.0	20.6	20.2	19.8	19.5
16	23.6	23.0	22.4	21.9	21.4	21.0	20.6	20.2	19.8	19.5
17	26.8	26.5	26.2	26.0	25.8	25.2	...	...	...	...
18	26.8	26.5	26.2	26.0	25.8	25.2	...	...	...	...
19	26.8	26.5	26.2	26.0	25.8	25.2	...	...	...	...
20	26.8	26.5	26.2	26.0	25.8	25.2	...	...	...	...
21	26.8	26.5	26.2	26.0	25.8	25.2	...	...	...	...
22	26.8	26.5	26.2	26.0	25.8	25.2	...	...	...	...
23	30.7	30.3	30.0	29.8	29.4	28.8	...	...	...	...
24	24.8	24.0	23.3	22.7	22.2	21.8	21.5	21.3	21.0	20.7
25	24.8	24.0	23.3	22.7	22.2	21.8	21.5	21.3	21.0	20.7
26	23.7	23.0	22.3	21.8	21.3	20.9	20.6	20.3	20.1	19.9
27	23.7	23.0	22.3	21.8	21.3	20.9	20.6	20.3	20.1	19.9
28	22.4	21.7	21.0	20.3	19.7	19.1	18.6	18.1	17.6	17.2
29	22.4	21.7	21.0	20.3	19.7	19.1	18.6	18.1	17.6	17.2
30	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
31	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
32	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
33	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
34	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
35	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
36	...	24.7	24.1	23.6	23.2	22.8	22.4	22.2	...	...
37	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
38	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
39	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
40	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
41	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
42	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
43	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
44	...	26.5	26.0	25.5	25.2	24.9	24.7	24.6	24.5	24.4
45	21.2	20.7	20.2	19.8	19.4	19.1	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	26Ni-43Fe-22Cr-5Mo	Plate, sheet, strip	SB-620	...	N08320	Solution ann.
2	26Ni-43Fe-22Cr-5Mo	Rod	SB-621	...	N08320	Solution ann.
3	26Ni-43Fe-22Cr-5Mo	Smls. pipe & tube	SB-622	...	N08320	Solution ann.
4	26Ni-43Fe-22Cr-5Mo	Wld. tube	SB-626	...	N08320	Solution ann.
5	35Ni-19Cr-1 $\frac{1}{4}$ Si	Bar	SB-511	...	N08330	...
6	35Ni-19Cr-1 $\frac{1}{4}$ Si	Pipe	SB-535	...	N08330	...
7	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate	SB-536	...	N08330	...
8	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. fittings	SB-366	...	N08330	Annealed
9	35Ni-19Cr-1 $\frac{1}{4}$ Si	Smls. & wld. pipe	SB-535	...	N08330	Annealed
10	35Ni-19Cr-1 $\frac{1}{4}$ Si	Plate, sheet, strip	SB-536	...	N08330	Annealed
11	35Ni-19Cr-1 $\frac{1}{4}$ Si	Wld. pipe	SB-710	...	N08330	Annealed
12	35Ni-23Cr-7.5Mo-N	Plate, sheet, strip	SB-625	...	N08354	Solution ann.
13	35Ni-23Cr-7.5Mo-N	Bar, wire	SB-649	...	N08354	Solution ann.
14	35Ni-23Cr-7.5Mo-N	Wld. pipe	SB-673	...	N08354	Solution ann.
15	35Ni-23Cr-7.5Mo-N	Wld. tube	SB-674	...	N08354	Solution ann.
16	35Ni-23Cr-7.5Mo-N	Smls. pipe & tube	SB-677	...	N08354	Solution ann.
17	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-462	...	N08367	Solution ann.
18	46Fe-24Ni-21Cr-6Mo-N	Forgings	SB-564	...	N08367	Solution ann.
19	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.
20	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.
21	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.
22	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.
23	46Fe-24Ni-21Cr-6Mo-N	Bar, rod, wire	SB-691	...	N08367	Solution ann.
24	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.
25	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-675	...	N08367	Solution ann.
26	46Fe-24Ni-21Cr-6Mo-N	Wld. tube	SB-676	...	N08367	Solution ann.
27	46Fe-24Ni-21Cr-6Mo-N	Plate, sheet, strip	SB-688	...	N08367	Solution ann.
28	46Fe-24Ni-21Cr-6Mo-N	Smls. pipe & tube	SB-690	...	N08367	Solution ann.
29	46Fe-24Ni-21Cr-6Mo-N	Wld. pipe	SB-804	...	N08367	Solution ann.
30	46Fe-24Ni-21Cr-6Mo-N	Castings	SA-351	CN3MN	J94651	Solution ann.
31	25Ni-47Fe-21Cr-5Mo	Plate, sheet, strip	SB-599	...	N08700	Solution ann.
32	25Ni-47Fe-21Cr-5Mo	Bar, wire	SB-672	...	N08700	Solution ann.
33	32Ni-45Fe-20Cr-Cb	Castings	SA-351	CT15C	...	As cast
34	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Annealed
35	33Ni-42Fe-21Cr	Smls. & wld. fittings	SB-366	...	N08800	Annealed
36	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08800	Annealed
37	33Ni-42Fe-21Cr	Bar	SB-408	...	N08800	Annealed
38	33Ni-42Fe-21Cr	Plate	SB-409	...	N08800	Annealed
39	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08800	Annealed
40	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08800	Annealed
41	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08800	Annealed
42	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Annealed
43	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08800	Cold worked
44	32Ni-44Fe-21Cr	Smls. tube	SB-163	...	N08801	Ann./stabilized
45	32Ni-44Fe-21Cr	Smls. pipe & tube	SB-407	...	N08801	Ann./stabilized

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	75	28	...
2	...	75	28	...
3	...	75	28	...
4	...	75	28	...
5	...	70	30	...
6	...	70	30	...
7	...	70	30	...
8	...	70	30	...
9	...	70	30	...
10	...	70	30	...
11	...	70	30	...
12	...	93	43	...
13	...	93	43	...
14	...	93	43	...
15	...	93	43	...
16	...	93	43	...
17	...	95	45	...
18	...	95	45	...
19	$> \frac{3}{16}$	95	45	...
20	$> \frac{3}{16}$	95	45	...
21	$> \frac{3}{16}$	95	45	...
22	$> \frac{3}{16}$	95	45	...
23	...	95	45	...
24	$> \frac{3}{16}$	95	45	...
25	$\leq \frac{3}{16}$	100	45	...
26	$\leq \frac{3}{16}$	100	45	...
27	$\leq \frac{3}{16}$	100	45	...
28	$\leq \frac{3}{16}$	100	45	...
29	$\leq \frac{3}{16}$	100	45	...
30	...	80	38	...
31	...	80	35	...
32	...	80	35	...
33	...	63	25	...
34	...	75	30	...
35	...	75	30	...
36	...	75	30	...
37	...	75	30	...
38	...	75	30	...
39	...	75	30	...
40	...	75	30	...
41	...	75	30	...
42	...	75	40	...
43	...	83	47	...
44	...	65	25	...
45	...	65	25	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	28.0	26.7	25.9	25.2	24.5	23.8	23.1	22.4	21.8
2	28.0	26.7	25.9	25.2	24.5	23.8	23.1	22.4	21.8
3	28.0	26.7	25.9	25.2	24.5	23.8	23.1	22.4	21.8
4	28.0	26.7	25.9	25.2	24.5	23.8	23.1	22.4	21.8
5	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
6	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
7	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
8	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
9	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
10	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
11	30.0	27.7	26.5	25.5	24.7	23.9	23.2	22.6	22.0
12	42.8	...	36.5	...	33.1	...	30.8	...	29.4
13	42.8	...	36.5	...	33.1	...	30.8	...	29.4
14	42.8	...	36.5	...	33.1	...	30.8	...	29.4
15	42.8	...	36.5	...	33.1	...	30.8	...	29.4
16	42.8	...	36.5	...	33.1	...	30.8	...	29.4
17	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
18	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
19	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
20	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
21	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
22	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
23	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
24	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
25	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
26	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
27	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
28	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
29	45.0	41.3	39.3	37.4	35.7	34.2	32.9	31.8	30.8
30	38.0	34.3	32.0	30.0	28.2	26.6	25.4	24.3	23.5
31	35.0	33.1	31.5	29.9	28.5	27.4	26.6	26.1	25.7
32	35.0	33.1	31.5	29.9	28.5	27.4	26.6	26.1	25.7
33	25.0	24.1	23.6	23.2	22.9	22.7	22.4	22.1	21.8
34	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
35	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
36	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
37	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
38	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
39	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
40	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
41	30.0	28.5	27.7	27.1	26.6	26.2	25.8	25.5	25.1
42	40.0	...	37.0	...	35.5	...	34.4	...	33.5
43	47.0	...	43.4	...	41.7	...	40.4	...	39.5
44	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
45	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)										
1	21.2	20.7	20.2	19.8	19.4	19.1	...	...	...	...
2	21.2	20.7	20.2	19.8	19.4	19.1	...	...	...	...
3	21.2	20.7	20.2	19.8	19.4	19.1	...	...	...	...
4	21.2	20.7	20.2	19.8	19.4	19.1	...	...	...	...
5	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
6	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
7	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
8	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
9	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
10	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
11	21.5	21.0	20.6	20.1	19.7	19.3	18.9	18.5	18.2	17.9
12	...	28.3	27.9	27.4	27.0	26.5	...	...	...	...
13	...	28.3	27.9	27.4	27.0	26.5	...	...	...	...
14	...	28.3	27.9	27.4	27.0	26.5	...	...	...	...
15	...	28.3	27.9	27.4	27.0	26.5	...	...	...	...
16	...	28.3	27.9	27.4	27.0	26.5	...	...	...	...
17	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
18	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
19	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
20	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
21	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
22	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
23	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
24	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
25	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
26	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
27	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
28	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
29	29.9	29.1	28.5	27.9	27.4	27.0	26.6	26.2	...	...
30	22.9	22.4	22.0	21.8	21.5	21.4	21.2	21.1	21.1	21.1
31	25.3	24.7	23.8	...	...	...	...	...	...	...
32	25.3	24.7	23.8	...	...	...	...	...	...	...
33	21.5	21.2	20.9	20.6	20.3	19.9	19.6	19.3	19.0	18.8
34	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
35	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
36	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
37	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
38	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
39	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
40	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
41	24.8	24.5	24.1	23.8	23.5	23.2	22.9	22.7	22.4	22.1
42	...	32.6	32.2	31.8	31.4	31.0	...	...	...	...
43	...	38.7	38.7	...	...	...	...	...	...	...
44	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
45	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
6	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
7	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
8	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
9	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
10	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
11	17.6	17.3	16.9	16.4	16.0	15.4	14.8	14.2	13.5	12.7	11.8	10.8	9.8
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
35	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
36	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
37	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
38	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
39	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
40	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
41	21.8	21.2	20.4	19.6	18.6	17.5	16.2	14.7	13.0	11.1	...	...	...
42	29.0	28.2	27.3	26.1	24.8	23.3	21.6	19.6	17.3	14.8	...	...	...
43	34.1	33.1	32.0	30.7	29.2	27.4	25.3	23.0	20.4	17.4	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08810	Annealed
2	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08810	Annealed
3	33Ni-42Fe-21Cr	Bar	SB-408	...	N08810	Annealed
4	33Ni-42Fe-21Cr	Plate	SB-409	...	N08810	Annealed
5	33Ni-42Fe-21Cr	Wld. pipe	SB-514	...	N08810	Annealed
6	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08810	Annealed
7	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08810	Annealed
8	33Ni-42Fe-21Cr	Smls. tube	SB-163	...	N08811	Annealed
(23) 9	...	...	...	...	...	...
10	33Ni-42Fe-21Cr	Smls. pipe & tube	SB-407	...	N08811	Annealed
(23) 11	...	...	...	...	...	...
12	33Ni-42Fe-21Cr	Bar	SB-408	...	N08811	Annealed
(23) 13	...	...	...	...	...	...
14	33Ni-42Fe-21Cr	Plate	SB-409	...	N08811	Annealed
(23) 15	...	...	...	...	...	...
16	33Ni-42Fe-21Cr	Wld. tube	SB-515	...	N08811	Annealed
(23) 17	...	...	...	...	...	...
18	33Ni-42Fe-21Cr	Forgings	SB-564	...	N08811	Annealed
(23) 19	...	...	...	...	...	...
20	42Ni-21.5Cr-3Mo-2.3Cu	Smls. tube	SB-163	...	N08825	Annealed
21	42Ni-21.5Cr-3Mo-2.3Cu	Smls. & wld. fittings	SB-366	...	N08825	Annealed
22	42Ni-21.5Cr-3Mo-2.3Cu	Smls. pipe & tube	SB-423	...	N08825	Cold worked/ann.
23	42Ni-21.5Cr-3Mo-2.3Cu	Plate	SB-424	...	N08825	Annealed
24	42Ni-21.5Cr-3Mo-2.3Cu	Bar, rod	SB-425	...	N08825	Annealed
25	42Ni-21.5Cr-3Mo-2.3Cu	Forgings	SB-564	...	N08825	Annealed
26	42Ni-21.5Cr-3Mo-2.3Cu	Wld. tube	SB-704	...	N08825	Annealed
27	42Ni-21.5Cr-3Mo-2.3Cu	Wld. pipe	SB-705	...	N08825	Annealed
28	44Fe-25Ni-21Cr-Mo	Forgings	SA-182	...	N08904	Annealed
(23) 29	44Fe-25Ni-21Cr-Mo	Smls. tube	SA-213	...	N08904	Annealed
30	44Fe-25Ni-21Cr-Mo	Plate, sheet, strip	SA-240	...	N08904	Annealed
31	44Fe-25Ni-21Cr-Mo	Wld. tube	SA-249	...	N08904	Annealed
32	44Fe-25Ni-21Cr-Mo	Smls. & wld. pipe	SA-312	...	N08904	Annealed
33	44Fe-25Ni-21Cr-Mo	Fittings	SA-403	...	N08904	Annealed
(23) 34	44Fe-25Ni-21Cr-Mo	Bar	SA-479	...	N08904	Annealed
35	25Ni-20Cr-6Mo-Cu-N	Plate, sheet, strip	SB-625	...	N08925	Annealed
36	25Ni-20Cr-6Mo-Cu-N	Bar, wire	SB-649	...	N08925	Annealed
37	25Ni-20Cr-6Mo-Cu-N	Wld. pipe	SB-673	...	N08925	Annealed
38	25Ni-20Cr-6Mo-Cu-N	Wld. tube	SB-674	...	N08925	Annealed
39	25Ni-20Cr-6Mo-Cu-N	Smls. pipe & tube	SB-677	...	N08925	Annealed
40	62Ni-28Mo-5Fe	Plate	SB-333	...	N10001	Annealed
41	62Ni-28Mo-5Fe	Smls. & wld. fittings	SB-366	...	N10001	Annealed
42	62Ni-28Mo-5Fe	Wld. pipe	SB-619	...	N10001	Solution ann.
43	62Ni-28Mo-5Fe	Smls. pipe & tube	SB-622	...	N10001	Solution ann.
44	62Ni-28Mo-5Fe	Wld. tube	SB-626	...	N10001	Solution ann.
45	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	65	25	...
2	...	65	25	...
3	...	65	25	...
4	...	65	25	...
5	...	65	25	...
6	...	65	25	...
7	...	65	25	...
8	...	65	25	...
9	...	...	...	...
10	...	65	25	...
11	...	...	...	...
12	...	65	25	...
13	...	...	...	...
14	...	65	25	...
15	...	...	...	...
16	...	65	25	...
17	...	...	...	...
18	...	65	25	...
19	...	...	...	...
20	...	85	35	...
21	...	85	35	...
22	...	85	35	...
23	...	85	35	...
24	...	85	35	...
25	...	85	35	...
26	...	85	35	...
27	...	85	35	...
28	...	71	31	...
29	...	71	31	...
30	...	71	31	...
31	...	71	31	...
32	...	71	31	...
33	...	71	31	...
34	...	71	31	...
35	...	87	43	...
36	...	87	43	...
37	...	87	43	...
38	...	87	43	...
39	...	87	43	...
40	...	100	45	...
41	...	100	45	...
42	...	100	45	...
43	...	100	45	...
44	...	100	45	...
45	>1½	100	46	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
2	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
3	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
4	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
5	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
6	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
7	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
8	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
9	...	...	...	...	...	...	...	...	...
10	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
11	...	...	...	...	...	...	...	...	...
12	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
13	...	...	...	...	...	...	...	...	...
14	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
15	...	...	...	...	...	...	...	...	...
16	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
17	...	...	...	...	...	...	...	...	...
18	25.0	23.8	23.0	22.3	21.7	21.0	20.4	19.8	19.3
19	...	...	...	...	...	...	...	...	...
20	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
21	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
22	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
23	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
24	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
25	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
26	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
27	35.0	33.0	32.1	31.2	30.5	29.7	29.1	28.4	27.8
28	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
29	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
30	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
31	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
32	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
33	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
34	31.0	26.8	25.1	23.8	22.7	21.7	20.8	19.9	19.0
35	43.0	37.0	34.8	33.2	31.9	30.8	29.6	28.5	27.5
36	43.0	37.0	34.8	33.2	31.9	30.8	29.6	28.5	27.5
37	43.0	37.0	34.8	33.2	31.9	30.8	29.6	28.5	27.5
38	43.0	37.0	34.8	33.2	31.9	30.8	29.6	28.5	27.5
39	43.0	37.0	34.8	33.2	31.9	30.8	29.6	28.5	27.5
40	45.0	42.2	40.8	39.6	38.6	37.7	36.9	36.2	35.6
41	45.0	42.2	40.8	39.6	38.6	37.7	36.9	36.2	35.6
42	45.0	42.2	40.8	39.6	38.6	37.7	36.9	36.2	35.6
43	45.0	42.2	40.8	39.6	38.6	37.7	36.9	36.2	35.6
44	45.0	42.2	40.8	39.6	38.6	37.7	36.9	36.2	35.6
45	46.0	43.1	41.7	40.5	39.4	38.5	37.7	37.0	36.4

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
2	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
3	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
4	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
5	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
6	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
7	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
8	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
9	...	...	...	...	...	...	...	...	...	...
10	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
11	...	...	...	...	...	...	...	...	...	...
12	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
13	...	...	...	...	...	...	...	...	...	...
14	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
15	...	...	...	...	...	...	...	...	...	...
16	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
17	...	...	...	...	...	...	...	...	...	...
18	18.8	18.3	17.9	17.4	17.1	16.7	16.4	16.1	15.8	15.5
19	...	...	...	...	...	...	...	...	...	...
20	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
21	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
22	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
23	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
24	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
25	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
26	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
27	27.2	26.7	26.3	26.0	25.7	25.6	25.4	25.3	25.1	24.8
28	18.4	17.8	17.4	17.1	...	...	...	...	...	...
29	18.4	17.8	17.4	17.1	...	...	...	...	...	...
30	18.4	17.8	17.4	17.1	...	...	...	...	...	...
31	18.4	17.8	17.4	17.1	...	...	...	...	...	...
32	18.4	17.8	17.4	17.1	...	...	...	...	...	...
33	18.4	17.8	17.4	17.1	...	...	...	...	...	...
34	18.4	17.8	17.4	17.1	...	...	...	...	...	...
35	26.6	25.9	25.5	25.3	25.3	25.3	...	...	...	...
36	26.6	25.9	25.5	25.3	25.3	25.3	...	...	...	...
37	26.6	25.9	25.5	25.3	25.3	25.3	...	...	...	...
38	26.6	25.9	25.5	25.3	25.3	25.3	...	...	...	...
39	26.6	25.9	25.5	25.3	25.3	25.3	...	...	...	...
40	35.0	34.6	34.1	33.8	33.4	33.2	...	...	...	...
41	35.0	34.6	34.1	33.8	33.4	33.2	...	...	...	...
42	35.0	34.6	34.1	33.8	33.4	33.2	...	...	...	...
43	35.0	34.6	34.1	33.8	33.4	33.2	...	...	...	...
44	35.0	34.6	34.1	33.8	33.4	33.2	...	...	...	...
45	35.8	35.3	34.9	34.5	34.2	33.9	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
2	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
3	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
4	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
5	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
6	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
7	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
8	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	14.9	14.6	14.3	13.9	13.5	13.1	12.6	12.1	11.5	10.9	10.2	9.4	8.6
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Design./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	62Ni-28Mo-5Fe	Rod	SB-335	...	N10001	Annealed
2	62Ni-28Mo-5Fe	Sheet, strip	SB-333	...	N10001	Annealed
3	70Ni-16Mo-7Cr-5Fe	Smls. & wld. fittings	SB-366	...	N10003	Annealed
4	70Ni-16Mo-7Cr-5Fe	Plate, sheet, strip	SB-434	...	N10003	Annealed
5	70Ni-16Mo-7Cr-5Fe	Rod	SB-573	...	N10003	Annealed
6	62Ni-25Mo-8Cr-2Fe	Smls. & wld. fittings	SB-366	...	N10242	Annealed
7	62Ni-25Mo-8Cr-2Fe	Plate, sheet, strip	SB-434	...	N10242	Annealed
8	62Ni-25Mo-8Cr-2Fe	Forgings	SB-564	...	N10242	Annealed
9	62Ni-25Mo-8Cr-2Fe	Rod	SB-573	...	N10242	Annealed
10	62Ni-25Mo-8Cr-2Fe	Wld. pipe	SB-619	...	N10242	Solution ann.
11	62Ni-25Mo-8Cr-2Fe	Smls. pipe & tube	SB-622	...	N10242	Solution ann.
12	62Ni-25Mo-8Cr-2Fe	Wld. tube	SB-626	...	N10242	Solution ann.
13	54Ni-16Mo-15Cr	Smls. & wld. fittings	SB-366	...	N10276	Solution ann.
14	54Ni-16Mo-15Cr	Forgings	SB-462	...	N10276	Solution ann.
15	54Ni-16Mo-15Cr	Forgings	SB-564	...	N10276	Solution ann.
16	54Ni-16Mo-15Cr	Rod	SB-574	...	N10276	Solution ann.
17	54Ni-16Mo-15Cr	Plate, sheet, strip	SB-575	...	N10276	Solution ann.
18	54Ni-16Mo-15Cr	Wld. pipe	SB-619	...	N10276	Solution ann.
19	54Ni-16Mo-15Cr	Smls. pipe & tube	SB-622	...	N10276	Solution ann.
20	54Ni-16Mo-15Cr	Wld. tube	SB-626	...	N10276	Solution ann.
21	62Ni-22Mo-15Cr	Smls. & wld. fittings	SB-366	...	N10362	Solution ann.
22	62Ni-22Mo-15Cr	Forgings	SB-462	...	N10362	Solution ann.
23	62Ni-22Mo-15Cr	Forgings	SB-564	...	N10362	Solution ann.
24	62Ni-22Mo-15Cr	Rod	SB-574	...	N10362	Solution ann.
25	62Ni-22Mo-15Cr	Plate, sheet, strip	SB-575	...	N10362	Solution ann.
26	62Ni-22Mo-15Cr	Wld. pipe	SB-619	...	N10362	Solution ann.
27	62Ni-22Mo-15Cr	Smls. pipe & tube	SB-622	...	N10362	Solution ann.
28	62Ni-22Mo-15Cr	Wld. tube	SB-626	...	N10362	Solution ann.
29	Ni-28Mo-3Fe-1.3Cr-0.25Al	Plate, sheet, strip	SB-333	...	N10629	Solution ann.
30	Ni-28Mo-3Fe-1.3Cr-0.25Al	Rod	SB-335	...	N10629	Solution ann.
31	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. & wld. fittings	SB-366	...	N10629	Solution ann.
32	Ni-28Mo-3Fe-1.3Cr-0.25Al	Forgings	SB-564	...	N10629	Solution ann.
33	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. pipe	SB-619	...	N10629	Solution ann.
34	Ni-28Mo-3Fe-1.3Cr-0.25Al	Smls. pipe & tube	SB-622	...	N10629	Solution ann.
35	Ni-28Mo-3Fe-1.3Cr-0.25Al	Wld. tube	SB-626	...	N10629	Solution ann.
36	65Ni-28Mo-2Fe	Smls. & wld. fittings	SB-366	...	N10665	Annealed
37	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Annealed
38	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Annealed
39	65Ni-28Mo-2Fe	Plate, sheet, strip	SB-333	...	N10665	Solution ann.
40	65Ni-28Mo-2Fe	Rod	SB-335	...	N10665	Solution ann.
41	65Ni-28Mo-2Fe	Forgings	SB-462	...	N10665	Solution ann.
42	65Ni-28Mo-2Fe	Forgings	SB-564	...	N10665	Solution ann.
43	65Ni-28Mo-2Fe	Wld. pipe	SB-619	...	N10665	Solution ann.
44	65Ni-28Mo-2Fe	Smls. pipe & tube	SB-622	...	N10665	Solution ann.
45	65Ni-28Mo-2Fe	Wld. tube	SB-626	...	N10665	Solution ann.

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	$\frac{5}{16} < t \leq 1\frac{1}{2}$	115	46	...
2	...	115	50	...
3	...	100	40	...
4	...	100	40	...
5	...	100	40	...
6	...	105	45	...
7	...	105	45	...
8	...	105	45	...
9	...	105	45	...
10	...	105	45	...
11	...	105	45	...
12	...	105	45	...
13	...	100	41	...
14	...	100	41	...
15	...	100	41	...
16	...	100	41	...
17	...	100	41	...
18	...	100	41	...
19	...	100	41	...
20	...	100	41	...
21	...	105	45	...
22	...	105	45	...
23	...	105	45	...
24	...	105	45	...
25	...	105	45	...
26	...	105	45	...
27	...	105	45	...
28	...	105	45	...
29	...	110	51	...
30	...	110	51	...
31	...	110	51	...
32	...	110	51	...
33	...	110	51	...
34	...	110	51	...
35	...	110	51	...
36	...	110	51	...
37	...	110	51	...
38	...	110	51	...
39	...	110	51	...
40	...	110	51	...
41	...	110	51	...
42	...	110	51	...
43	...	110	51	...
44	...	110	51	...
45	...	110	51	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	46.0	43.1	41.7	40.5	39.4	38.5	37.7	37.0	36.4
2	50.0	46.9	45.3	44.0	42.8	41.9	41.0	40.2	39.6
3	40.0	37.8	36.3	34.9	33.7	32.6	31.7	30.9	30.2
4	40.0	37.8	36.3	34.9	33.7	32.6	31.7	30.9	30.2
5	40.0	37.8	36.3	34.9	33.7	32.6	31.7	30.9	30.2
6	45.0	...	42.3	...	39.2	...	37.0	...	35.9
7	45.0	...	42.3	...	39.2	...	37.0	...	35.9
8	45.0	...	42.3	...	39.2	...	37.0	...	35.9
9	45.0	...	42.3	...	39.2	...	37.0	...	35.9
10	45.0	...	42.3	...	39.2	...	37.0	...	35.9
11	45.0	...	42.3	...	39.2	...	37.0	...	35.9
12	45.0	...	42.3	...	39.2	...	37.0	...	35.9
13	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
14	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
15	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
16	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
17	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
18	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
19	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
20	41.0	38.8	37.3	35.9	34.5	33.2	32.0	30.9	29.8
21	45.0	...	40.1	...	36.7	...	34.1	...	32.1
22	45.0	...	40.1	...	36.7	...	34.1	...	32.1
23	45.0	...	40.1	...	36.7	...	34.1	...	32.1
24	45.0	...	40.1	...	36.7	...	34.1	...	32.1
25	45.0	...	40.1	...	36.7	...	34.1	...	32.1
26	45.0	...	40.1	...	36.7	...	34.1	...	32.1
27	45.0	...	40.1	...	36.7	...	34.1	...	32.1
28	45.0	...	40.1	...	36.7	...	34.1	...	32.1
29	51.0	...	47.1	...	44.4	...	42.2	...	40.5
30	51.0	...	47.1	...	44.4	...	42.2	...	40.5
31	51.0	...	47.1	...	44.4	...	42.2	...	40.5
32	51.0	...	47.1	...	44.4	...	42.2	...	40.5
33	51.0	...	47.1	...	44.4	...	42.2	...	40.5
34	51.0	...	47.1	...	44.4	...	42.2	...	40.5
35	51.0	...	47.1	...	44.4	...	42.2	...	40.5
36	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
37	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
38	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
39	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
40	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
41	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
42	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
43	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
44	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9
45	51.0	49.2	47.9	46.6	45.4	44.3	43.4	42.6	41.9

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
Nonferrous Materials (Cont'd)										
1	35.8	35.3	34.9	34.5	34.2	33.9	...	...	...	...
2	38.9	38.4	37.9	37.5	37.2	36.9	...	...	...	...
3	29.6	29.1	28.6	28.3	28.0	27.7	27.5	27.4	27.2	27.1
4	29.6	29.1	28.6	28.3	28.0	27.7	27.5	27.4	27.2	27.1
5	29.6	29.1	28.6	28.3	28.0	27.7	27.5	27.4	27.2	27.1
6	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
7	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
8	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
9	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
10	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
11	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
12	...	35.5	35.4	35.2	34.8	34.3	33.6	33.0	32.5	32.4
13	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
14	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
15	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
16	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
17	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
18	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
19	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
20	28.9	28.0	27.3	26.7	26.1	25.7	25.3	25.1	24.9	24.8
21	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
22	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
23	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
24	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
25	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
26	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
27	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
28	...	30.8	30.4	30.0	29.7	29.4	...	...	...	...
29	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
30	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
31	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
32	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
33	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
34	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
35	...	39.2	38.7	38.3	37.9	37.7	37.4	37.3	37.1	...
36	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
37	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
38	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
39	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
40	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
41	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
42	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
43	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
44	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8
45	41.3	40.8	40.3	39.8	39.3	38.7	38.0	37.3	36.5	35.8

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	27.0	26.9	26.8	26.7	...	...	...	...	...	...	...	...	...
4	27.0	26.9	26.8	26.7	...	...	...	...	...	...	...	...	...
5	27.0	26.9	26.8	26.7	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
14	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
15	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
16	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
17	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
18	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
19	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
20	24.6	24.5	24.5	24.5	24.4	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	65Ni-29.5Mo-2Fe-2Cr	Plate, sheet, strip	SB-333	...	N10675	Solution ann.
2	65Ni-29.5Mo-2Fe-2Cr	Rod	SB-335	...	N10675	Solution ann.
3	65Ni-29.5Mo-2Fe-2Cr	Smls. & wld. fittings	SB-366	...	N10675	Solution ann.
4	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-462	...	N10675	Solution ann.
5	65Ni-29.5Mo-2Fe-2Cr	Forgings	SB-564	...	N10675	Solution ann.
6	65Ni-29.5Mo-2Fe-2Cr	Wld. pipe	SB-619	...	N10675	Solution ann.
7	65Ni-29.5Mo-2Fe-2Cr	Smls. pipe & tube	SB-622	...	N10675	Solution ann.
8	65Ni-29.5Mo-2Fe-2Cr	Wld. tube	SB-626	...	N10675	Solution ann.
9	37Ni-30Co-28Cr-2.7Si	Plate, sheet, strip	SB-435	...	N12160	Solution ann.
10	37Ni-30Co-28Cr-2.7Si	Forgings	SB-564	...	N12160	Solution ann.
11	37Ni-30Co-28Cr-2.7Si	Bar	SB-572	...	N12160	Solution ann.
12	37Ni-30Co-28Cr-2.7Si	Wld. pipe	SB-619	...	N12160	Solution ann.
13	37Ni-30Co-28Cr-2.7Si	Smls. pipe & tube	SB-622	...	N12160	Solution ann.
14	37Ni-30Co-28Cr-2.7Si	Wld. tube	SB-626	...	N12160	Solution ann.
15	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Smls. & wld. fittings	SB-366	...	R20033	Solution ann.
16	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Forgings	SB-564	...	R20033	Solution ann.
17	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Wld. pipe	SB-619	...	R20033	Solution ann.
18	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Smls. pipe & tube	SB-622	...	R20033	Solution ann.
19	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Plate, sheet, strip	SB-625	...	R20033	Solution ann.
20	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Wld. tube	SB-626	...	R20033	Solution ann.
21	33Cr-31Ni-32Fe-1.5Mo-0.6Cu-N	Rod	SB-649	...	R20033	Solution ann.
22	21Ni-30Fe-22Cr-18Co-3Mo-3W	Plate, sheet, strip	SB-435	...	R30556	Annealed
23	21Ni-30Fe-22Cr-18Co-3Mo-3W	Rod	SB-572	...	R30556	Annealed
24	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. pipe	SB-619	...	R30556	Annealed
25	21Ni-30Fe-22Cr-18Co-3Mo-3W	Smls. pipe & tube	SB-622	...	R30556	Annealed
26	21Ni-30Fe-22Cr-18Co-3Mo-3W	Wld. tube	SB-626	...	R30556	Annealed
27	Co-26Cr-9Ni-5Mo-3Fe-2W	Rod	SB-815	...	R31233	Solution ann.
28	Co-26Cr-9Ni-5Mo-3Fe-2W	Plate, sheet, strip	SB-818	...	R31233	Solution ann.
29	Ti	Plate, sheet, strip	SB-265	1	R50250	Annealed
30	Ti	Smls. & wld. tube	SB-338	1	R50250	Annealed
31	Ti	Bar, billet	SB-348	1	R50250	Annealed
32	Ti	Forgings	SB-381	F-1	R50250	Annealed
33	Ti	Smls. pipe	SB-861	1	R50250	Annealed
34	Ti	Wld. pipe	SB-862	1	R50250	Annealed
35	Ti	Castings	SB-367	C-2	R50400	...
36	Ti	Plate, sheet, strip	SB-265	2	R50400	Annealed
37	Ti	Smls. & wld. tube	SB-338	2	R50400	Annealed
38	Ti	Bar, billet	SB-348	2	R50400	Annealed
39	Ti	Forgings	SB-381	F-2	R50400	Annealed
40	Ti	Smls. pipe	SB-861	2	R50400	Annealed
41	Ti	Wld. pipe	SB-862	2	R50400	Annealed
42	Ti	Plate, sheet, strip	SB-265	2H	R50400	Annealed
43	Ti	Smls. & wld. tube	SB-338	2H	R50400	Annealed
44	Ti	Bar, billet	SB-348	2H	R50400	Annealed
45	Ti	Smls. fittings	SB-363	WPT2H	R50400	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	110	51	...
2	...	110	51	...
3	...	110	51	...
4	...	110	51	...
5	...	110	51	...
6	...	110	51	...
7	...	110	51	...
8	...	110	51	...
9	...	90	35	...
10	...	90	35	...
11	...	90	35	...
12	...	90	35	...
13	...	90	35	...
14	...	90	35	...
15	...	109	55	...
16	...	109	55	...
17	...	109	55	...
18	...	109	55	...
19	...	109	55	...
20	...	109	55	...
21	...	109	55	...
22	...	100	45	...
23	...	100	45	...
24	...	100	45	...
25	...	100	45	...
26	...	100	45	...
27	...	130	55	...
28	...	130	55	...
29	...	35	20	...
30	...	35	20	...
31	...	35	20	...
32	...	35	20	...
33	...	35	20	...
34	...	35	20	...
35	...	50	40	...
36	...	50	40	...
37	...	50	40	...
38	...	50	40	...
39	...	50	40	...
40	...	50	40	...
41	...	50	40	...
42	...	58	40	...
43	...	58	40	...
44	...	58	40	...
45	...	58	40	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	51.0	...	47.8	...	45.4	...	43.2	...	41.1
2	51.0	...	47.8	...	45.4	...	43.2	...	41.1
3	51.0	...	47.8	...	45.4	...	43.2	...	41.1
4	51.0	...	47.8	...	45.4	...	43.2	...	41.1
5	51.0	...	47.8	...	45.4	...	43.2	...	41.1
6	51.0	...	47.8	...	45.4	...	43.2	...	41.1
7	51.0	...	47.8	...	45.4	...	43.2	...	41.1
8	51.0	...	47.8	...	45.4	...	43.2	...	41.1
9	35.0	...	30.8	...	27.5	...	24.7	...	22.5
10	35.0	...	30.8	...	27.5	...	24.7	...	22.5
11	35.0	...	30.8	...	27.5	...	24.7	...	22.5
12	35.0	...	30.8	...	27.5	...	24.7	...	22.5
13	35.0	...	30.8	...	27.5	...	24.7	...	22.5
14	35.0	...	30.8	...	27.5	...	24.7	...	22.5
15	55.0	...	46.3	...	42.1	...	39.2	...	37.1
16	55.0	...	46.3	...	42.1	...	39.2	...	37.1
17	55.0	...	46.3	...	42.1	...	39.2	...	37.1
18	55.0	...	46.3	...	42.1	...	39.2	...	37.1
19	55.0	...	46.3	...	42.1	...	39.2	...	37.1
20	55.0	...	46.3	...	42.1	...	39.2	...	37.1
21	55.0	...	46.3	...	42.1	...	39.2	...	37.1
22	45.0	40.8	38.4	36.4	34.7	33.2	32.0	31.0	30.2
23	45.0	40.8	38.4	36.4	34.7	33.2	32.0	31.0	30.2
24	45.0	40.8	38.4	36.4	34.7	33.2	32.0	31.0	30.2
25	45.0	40.8	38.4	36.4	34.7	33.2	32.0	31.0	30.2
26	45.0	40.8	38.4	36.4	34.7	33.2	32.0	31.0	30.2
27	55.0	...	48.2	...	42.8	...	38.3	...	35.1
28	55.0	...	48.2	...	42.8	...	38.3	...	35.1
29	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
30	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
31	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
32	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
33	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
34	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
35	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
36	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
37	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
38	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
39	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
40	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
41	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
42	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
43	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
44	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
45	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
2	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
3	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
4	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
5	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
6	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
7	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
8	...	39.4	38.7	38.1	37.6	37.3	37.0	36.8	36.6	36.3
9	...	21.1	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3
10	...	21.1	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3
11	...	21.1	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3
12	...	21.1	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3
13	...	21.1	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3
14	...	21.1	20.7	20.4	20.3	20.3	20.3	20.3	20.3	20.3
15	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
16	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
17	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
18	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
19	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
20	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
21	...	35.7	35.2	34.7	34.3	33.9	33.6	33.2	...	...
22	29.5	28.9	28.4	28.0	27.6	27.3	27.0	26.7	26.5	26.2
23	29.5	28.9	28.4	28.0	27.6	27.3	27.0	26.7	26.5	26.2
24	29.5	28.9	28.4	28.0	27.6	27.3	27.0	26.7	26.5	26.2
25	29.5	28.9	28.4	28.0	27.6	27.3	27.0	26.7	26.5	26.2
26	29.5	28.9	28.4	28.0	27.6	27.3	27.0	26.7	26.5	26.2
27	...	33.0	32.3	31.8	31.3	30.8	30.2	29.4	28.3	26.8
28	...	33.0	32.3	31.8	31.3	30.8	30.2	29.4	28.3	26.8
29	5.7	5.3	...	...	...	...	...	...	...	...
30	5.7	5.3	...	...	...	...	...	...	...	...
31	5.7	5.3	...	...	...	...	...	...	...	...
32	5.7	5.3	...	...	...	...	...	...	...	...
33	5.7	5.3	...	...	...	...	...	...	...	...
34	5.7	5.3	...	...	...	...	...	...	...	...
35	12.6	11.4	...	...	...	...	...	...	...	...
36	12.6	11.4	...	...	...	...	...	...	...	...
37	12.6	11.4	...	...	...	...	...	...	...	...
38	12.6	11.4	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...
40	12.6	11.4	...	...	...	...	...	...	...	...
41	12.6	11.4	...	...	...	...	...	...	...	...
42	12.6	11.4	...	...	...	...	...	...	...	...
43	12.6	11.4	...	...	...	...	...	...	...	...
44	12.6	11.4	...	...	...	...	...	...	...	...
45	12.6	11.4	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	Ti	Wld. fittings	SB-363	WPT2HW	R50400	Annealed
2	Ti	Forgings	SB-381	F-2H	R50400	Annealed
3	Ti	Smls. pipe	SB-861	2H	R50400	Annealed
4	Ti	Wld. pipe	SB-862	2H	R50400	Annealed
5	Ti	Plate, sheet, strip	SB-265	3	R50550	Annealed
6	Ti	Smls. & wld. tube	SB-338	3	R50550	Annealed
7	Ti	Bar, billet	SB-348	3	R50550	Annealed
8	Ti	Castings	SB-367	C-3	R50550	Annealed
9	Ti	Forgings	SB-381	F-3	R50550	Annealed
10	Ti	Smls. pipe	SB-861	3	R50550	Annealed
11	Ti	Wld. pipe	SB-862	3	R50550	Annealed
12	Ti-Pd	Plate, sheet, strip	SB-265	11	R52250	Annealed
13	Ti-Pd	Plate, sheet, strip	SB-265	17	R52252	Annealed
14	Ti-Ru	Plate, sheet, strip	SB-265	27	R52254	Annealed
15	Ti-Pd	Plate, sheet, strip	SB-265	7	R52400	Annealed
16	Ti-Pd	Smls. & wld. tube	SB-338	7	R52400	Annealed
17	Ti-Pd	Bar, billet	SB-348	7	R52400	Annealed
18	Ti-Pd	Forgings	SB-381	F-7	R52400	Annealed
19	Ti-Pd	Smls. pipe	SB-861	7	R52400	Annealed
20	Ti-Pd	Wld. pipe	SB-862	7	R52400	Annealed
21	Ti-0.15Pd	Plate, sheet, strip	SB-265	7H	R52400	Annealed
22	Ti-0.15Pd	Smls. & wld. tube	SB-338	7H	R52400	Annealed
23	Ti-0.15Pd	Bar, billet	SB-348	7H	R52400	Annealed
24	Ti-0.15Pd	Smls. fittings	SB-363	WPT7H	R52400	Annealed
25	Ti-0.15Pd	Wld. fittings	SB-363	WPT7HW	R52400	Annealed
26	Ti-0.15Pd	Forgings	SB-381	F-7H	R52400	Annealed
27	Ti-0.15Pd	Smls. pipe	SB-861	7H	R52400	Annealed
28	Ti-0.15Pd	Wld. pipe	SB-862	7H	R52400	Annealed
29	Ti-0.05Pd	Plate, sheet, strip	SB-265	16H	R52402	Annealed
30	Ti-0.05Pd	Smls. & wld. tube	SB-338	16H	R52402	Annealed
31	Ti-0.05Pd	Bar, billet	SB-348	16H	R52402	Annealed
32	Ti-0.05Pd	Smls. fittings	SB-363	WPT16H	R52402	Annealed
33	Ti-0.05Pd	Wld. fittings	SB-363	WPT16HW	R52402	Annealed
34	Ti-0.05Pd	Forgings	SB-381	F-16H	R52402	Annealed
35	Ti-0.05Pd	Smls. pipe	SB-861	16H	R52402	Annealed
36	Ti-0.05Pd	Wld. pipe	SB-862	16H	R52402	Annealed
37	Ti-Ru	Plate, sheet, strip	SB-265	26	R52404	Annealed
38	Ti-Ru	Smls. & wld. tube	SB-338	26	R52404	Annealed
39	Ti-Ru	Bar, billet	SB-348	26	R52404	Annealed
40	Ti-Ru	Smls. fittings	SB-363	WPT26	R52404	Annealed
41	Ti-Ru	Wld. fittings	SB-363	WPT26W	R52404	Annealed
42	Ti-Ru	Forgings	SB-381	F-26	R52404	Annealed
43	Ti-Ru	Smls. pipe	SB-861	26	R52404	Annealed
44	Ti-Ru	Wld. pipe	SB-862	26	R52404	Annealed
45	Ti-0.10Ru	Plate, sheet, strip	SB-265	26H	R52404	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	58	40	...
2	...	58	40	...
3	...	58	40	...
4	...	58	40	...
5	...	65	55	...
6	...	65	55	...
7	...	65	55	...
8	...	65	55	...
9	...	65	55	...
10	...	65	55	...
11	...	65	55	...
12	...	35	20	...
13	...	35	20	...
14	...	35	20	...
15	...	50	40	...
16	...	50	40	...
17	...	50	40	...
18	...	50	40	...
19	...	50	40	...
20	...	50	40	...
21	...	58	40	...
22	...	58	40	...
23	...	58	40	...
24	...	58	40	...
25	...	58	40	...
26	...	58	40	...
27	...	58	40	...
28	...	58	40	...
29	...	58	40	...
30	...	58	40	...
31	...	58	40	...
32	...	58	40	...
33	...	58	40	...
34	...	58	40	...
35	...	58	40	...
36	...	58	40	...
37	...	50	40	...
38	...	50	40	...
39	...	50	40	...
40	...	50	40	...
41	...	50	40	...
42	...	50	40	...
43	...	50	40	...
44	...	50	40	...
45	...	58	40	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
2	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
3	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
4	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
5	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
6	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
7	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
8	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
9	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
10	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
11	55.0	48.4	44.0	39.8	35.7	32.0	28.6	25.5	22.5
12	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
13	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
14	20.0	16.1	14.0	12.3	10.8	9.4	8.2	7.1	6.3
15	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
16	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
17	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
18	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
19	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
20	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
21	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
22	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
23	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
24	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
25	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
26	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
27	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
28	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
29	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
30	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
31	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
32	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
33	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
34	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
35	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
36	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
37	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
38	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
39	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
40	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
41	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
42	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
43	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
44	40.0	34.5	31.5	28.6	25.6	22.6	19.6	17.0	14.8
45	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	12.6	11.4	...	...	...	...	...	...	...	...
2	12.6	11.4	...	...	...	...	...	...	...	...
3	12.6	11.4	...	...	...	...	...	...	...	...
4	12.6	11.4	...	...	...	...	...	...	...	...
5	19.8	17.1	...	...	...	...	...	...	...	...
6	19.8	17.1	...	...	...	...	...	...	...	...
7	19.8	17.1	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...
9	19.8	17.1	...	...	...	...	...	...	...	...
10	19.8	17.1	...	...	...	...	...	...	...	...
11	19.8	17.1	...	...	...	...	...	...	...	...
12	5.7	5.3	...	...	...	...	...	...	...	...
13	5.7	5.3	...	...	...	...	...	...	...	...
14	5.7	5.3	...	...	...	...	...	...	...	...
15	12.6	11.4	...	...	...	...	...	...	...	...
16	12.6	11.4	...	...	...	...	...	...	...	...
17	12.6	11.4	...	...	...	...	...	...	...	...
18	12.6	11.4	...	...	...	...	...	...	...	...
19	12.6	11.4	...	...	...	...	...	...	...	...
20	12.6	11.4	...	...	...	...	...	...	...	...
21	12.6	11.4	...	...	...	...	...	...	...	...
22	12.6	11.4	...	...	...	...	...	...	...	...
23	12.6	11.4	...	...	...	...	...	...	...	...
24	12.6	11.4	...	...	...	...	...	...	...	...
25	12.6	11.4	...	...	...	...	...	...	...	...
26	12.6	11.4	...	...	...	...	...	...	...	...
27	12.6	11.4	...	...	...	...	...	...	...	...
28	12.6	11.4	...	...	...	...	...	...	...	...
29	12.6	11.4	...	...	...	...	...	...	...	...
30	12.6	11.4	...	...	...	...	...	...	...	...
31	12.6	11.4	...	...	...	...	...	...	...	...
32	12.6	11.4	...	...	...	...	...	...	...	...
33	12.6	11.4	...	...	...	...	...	...	...	...
34	12.6	11.4	...	...	...	...	...	...	...	...
35	12.6	11.4	...	...	...	...	...	...	...	...
36	12.6	11.4	...	...	...	...	...	...	...	...
37	12.6	11.4	...	...	...	...	...	...	...	...
38	12.6	11.4	...	...	...	...	...	...	...	...
39	12.6	11.4	...	...	...	...	...	...	...	...
40	12.6	11.4	...	...	...	...	...	...	...	...
41	12.6	11.4	...	...	...	...	...	...	...	...
42	12.6	11.4	...	...	...	...	...	...	...	...
43	12.6	11.4	...	...	...	...	...	...	...	...
44	12.6	11.4	...	...	...	...	...	...	...	...
45	12.6	11.4	...	...	...	...	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/ Temper
Nonferrous Materials (Cont'd)						
1	Ti-0.10Ru	Smls. & wld. tube	SB-338	26H	R52404	Annealed
2	Ti-0.10Ru	Bar, billet	SB-348	26H	R52404	Annealed
3	Ti-0.10Ru	Smls. fittings	SB-363	WPT26H	R52404	Annealed
4	Ti-0.10Ru	Wld. fittings	SB-363	WPT26HW	R52404	Annealed
5	Ti-0.10Ru	Forgings	SB-381	F-26H	R52404	Annealed
6	Ti-0.10Ru	Smls. pipe	SB-861	26H	R52404	Annealed
7	Ti-0.10Ru	Wld. pipe	SB-862	26H	R52404	Annealed
8	Ti-0.3Mo-0.8Ni	Plate, sheet, strip	SB-265	12	R53400	Annealed
9	Ti-0.3Mo-0.8Ni	Smls. & wld. tube	SB-338	12	R53400	Annealed
10	Ti-0.3Mo-0.8Ni	Bar, billet	SB-348	12	R53400	Annealed
11	Ti-0.3Mo-0.8Ni	Forgings	SB-381	F-12	R53400	Annealed
12	Ti-0.3Mo-0.8Ni	Smls. pipe	SB-861	12	R53400	Annealed
13	Ti-0.3Mo-0.8Ni	Wld. pipe	SB-862	12	R53400	Annealed
14	Ti-4Al-2.5V-1.5Fe	Plate, sheet, strip	SB-265	38	R54250	Annealed
15	Ti-4Al-2.5V-1.5Fe	Smls. tube	SB-338	38	R54250	Annealed
16	Ti-4Al-2.5V-1.5Fe	Wld. tube	SB-338	38	R54250	Annealed
17	Ti-4Al-2.5V-1.5Fe	Bar, billet	SB-348	38	R54250	Annealed
18	Ti-4Al-2.5V-1.5Fe	Smls. fittings	SB-363	WPT38	R54250	Annealed
19	Ti-4Al-2.5V-1.5Fe	Wld. fittings	SB-363	WPT38W	R54250	Annealed
20	Ti-4Al-2.5V-1.5Fe	Forgings	SB-381	F-38	R54250	Annealed
21	Ti-4Al-2.5V-1.5Fe	Smls. pipe	SB-861	38	R54250	Annealed
22	Ti-4Al-2.5V-1.5Fe	Wld. pipe	SB-862	38	R54250	Annealed
23	Ti-3Al-2.5V	Plate, sheet, strip	SB-265	9	R56320	Annealed
24	Ti-3Al-2.5V	Smls. & wld. tube	SB-338	9	R56320	Annealed
25	Ti-3Al-2.5V	Bar, billet	SB-348	9	R56320	Annealed
26	Ti-3Al-2.5V	Smls. fittings	SB-363	WPT9	R56320	Annealed
27	Ti-3Al-2.5V	Wld. fittings	SB-363	WPT9W	R56320	Annealed
28	Ti-3Al-2.5V	Forgings	SB-381	F-9	R56320	Annealed
29	Ti-3Al-2.5V	Smls. pipe	SB-861	9	R56320	Annealed
30	Ti-3Al-2.5V	Wld. pipe	SB-862	9	R56320	Annealed
31	Ti-3Al-2.5V-0.1Ru	Plate, sheet, strip	SB-265	28	R56323	Annealed
32	Ti-3Al-2.5V-0.1Ru	Smls. & wld. tube	SB-338	28	R56323	Annealed
33	Ti-3Al-2.5V-0.1Ru	Bar, billet	SB-348	28	R56323	Annealed
34	Ti-3Al-2.5V-0.1Ru	Smls. fittings	SB-363	WPT28	R56323	Annealed
35	Ti-3Al-2.5V-0.1Ru	Wld. fittings	SB-363	WPT28W	R56323	Annealed
36	Ti-3Al-2.5V-0.1Ru	Forgings	SB-381	F-28	R56323	Annealed
37	Ti-3Al-2.5V-0.1Ru	Smls. pipe	SB-861	28	R56323	Annealed
38	Ti-3Al-2.5V-0.1Ru	Wld. pipe	SB-862	28	R56323	Annealed
39	99.2Zr	Forgings	SB-493	...	R60702	Annealed
40	99.2Zr	Smls. & wld. tube	SB-523	...	R60702	Annealed
41	99.2Zr	Bar, wire	SB-550	...	R60702	Annealed
42	99.2Zr	Plate, sheet, strip	SB-551	...	R60702	Annealed
43	99.2Zr	Smls. fittings	SB-653	PZ-2	R60702	Annealed
44	99.2Zr	Wld. fittings	SB-653	PZ-2W	R60702	Annealed
45	99.2Zr	Smls. & wld. pipe	SB-658	...	R60702	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	58	40	...
2	...	58	40	...
3	...	58	40	...
4	...	58	40	...
5	...	58	40	...
6	...	58	40	...
7	...	58	40	...
8	...	70	50	...
9	...	70	50	...
10	...	70	50	...
11	...	70	50	...
12	...	70	50	...
13	...	70	50	...
14	...	130	115	...
15	...	130	115	...
16	...	130	115	...
17	...	130	115	...
18	...	130	115	...
19	...	130	115	...
20	...	130	115	...
21	...	130	115	...
22	...	130	115	...
23	...	90	70	...
24	...	90	70	...
25	...	90	70	...
26	...	90	70	...
27	...	90	70	...
28	...	90	70	...
29	...	90	70	...
30	...	90	70	...
31	...	90	70	...
32	...	90	70	...
33	...	90	70	...
34	...	90	70	...
35	...	90	70	...
36	...	90	70	...
37	...	90	70	...
38	...	90	70	...
39	...	55	30	...
40	...	55	30	...
41	...	55	30	...
42	...	55	30	...
43	...	55	30	...
44	...	55	30	...
45	...	55	30	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
Nonferrous Materials (Cont'd)									
1	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
2	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
3	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
4	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
5	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
6	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
7	40.0	34.9	32.2	28.4	25.2	22.0	18.6	16.3	14.1
8	50.0	45.0	41.5	38.1	35.0	32.2	29.4	27.7	26.0
9	50.0	45.0	41.5	38.1	35.0	32.2	29.4	27.7	26.0
10	50.0	45.0	41.5	38.1	35.0	32.2	29.4	27.7	26.0
11	50.0	45.0	41.5	38.1	35.0	32.2	29.4	27.7	26.0
12	50.0	45.0	41.5	38.1	35.0	32.2	29.4	27.7	26.0
13	50.0	45.0	41.5	38.1	35.0	32.2	29.4	27.7	26.0
14	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
15	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
16	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
17	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
18	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
19	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
20	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
21	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
22	115.0	106.5	100.8	95.4	90.2	85.5	81.4	77.8	74.6
23	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
24	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
25	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
26	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
27	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
28	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
29	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
30	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
31	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
32	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
33	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
34	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
35	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
36	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
37	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
38	70.0	65.1	61.1	58.1	55.3	52.5	49.7	46.9	44.8
39	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0
40	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0
41	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0
42	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0
43	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0
44	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0
45	30.0	25.8	23.1	20.4	18.0	15.9	14.0	12.4	11.0

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	12.6	11.4	...	...	...	...	...	...	...	...
2	12.6	11.4	...	...	...	...	...	...	...	...
3	12.6	11.4	...	...	...	...	...	...	...	...
4	12.6	11.4	...	...	...	...	...	...	...	...
5	12.6	11.4	...	...	...	...	...	...	...	...
6	12.6	11.4	...	...	...	...	...	...	...	...
7	12.6	11.4	...	...	...	...	...	...	...	...
8	24.8	24.0	...	...	...	...	...	...	...	...
9	24.8	24.0	...	...	...	...	...	...	...	...
10	24.8	24.0	...	...	...	...	...	...	...	...
11	24.8	24.0	...	...	...	...	...	...	...	...
12	24.8	24.0	...	...	...	...	...	...	...	...
13	24.8	24.0	...	...	...	...	...	...	...	...
14	71.9	69.5	67.3	...	...	...	...	...	...	...
15	71.9	69.5	67.3	...	...	...	...	...	...	...
16	71.9	69.5	67.3	...	...	...	...	...	...	...
17	71.9	69.5	67.3	...	...	...	...	...	...	...
18	71.9	69.5	67.3	...	...	...	...	...	...	...
19	71.9	69.5	67.3	...	...	...	...	...	...	...
20	71.9	69.5	67.3	...	...	...	...	...	...	...
21	71.9	69.5	67.3	...	...	...	...	...	...	...
22	71.9	69.5	67.3	...	...	...	...	...	...	...
23	43.4	41.3	...	...	...	...	...	...	...	...
24	43.4	41.3	...	...	...	...	...	...	...	...
25	43.4	41.3	...	...	...	...	...	...	...	...
26	43.4	41.3	...	...	...	...	...	...	...	...
27	43.4	41.3	...	...	...	...	...	...	...	...
28	43.4	41.3	...	...	...	...	...	...	...	...
29	43.4	41.3	...	...	...	...	...	...	...	...
30	43.4	41.3	...	...	...	...	...	...	...	...
31	43.4	41.3	...	...	...	...	...	...	...	...
32	43.4	41.3	...	...	...	...	...	...	...	...
33	43.4	41.3	...	...	...	...	...	...	...	...
34	43.4	41.3	...	...	...	...	...	...	...	...
35	43.4	41.3	...	...	...	...	...	...	...	...
36	43.4	41.3	...	...	...	...	...	...	...	...
37	43.4	41.3	...	...	...	...	...	...	...	...
38	43.4	41.3	...	...	...	...	...	...	...	...
39	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...
40	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...
41	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...
42	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...
43	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...
44	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...
45	9.9	9.0	8.4	7.9	7.6	7.5	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding

Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
Nonferrous Materials (Cont'd)													
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...	...	...	...	...	...

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Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade	Alloy Desig./UNS No.	Class/Condition/Temper
Nonferrous Materials (Cont'd)						
(23) 1	95.5Zr + 2.5Nb	Forgings	SB-493	...	R60705	Annealed
(23) 2	95.5Zr + 2.5Nb	Smls. & wld. tube	SB-523	...	R60705	Annealed
(23) 3	95.5Zr + 2.5Nb	Bar, wire	SB-550	...	R60705	Annealed
(23) 4	95.5Zr + 2.5Nb	Plate, sheet, strip	SB-551	...	R60705	Annealed
(23) 5	95.5Zr + 2.5Nb	Smls. fittings	SB-653	PZ-5	R60705	Annealed
(23) 6	95.5Zr + 2.5Nb	Wld. fittings	SB-653	PZ-5W	R60705	Annealed
(23) 7	95.5Zr + 2.5Nb	Smls. & wld. pipe	SB-658	...	R60705	Annealed

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Line No.	Size/Thickness, in.	Min. Tensile Strength, ksi	Min. Yield Strength, ksi	Notes
Nonferrous Materials (Cont'd)				
1	...	70	55	...
2	...	80	55	...
3	...	80	55	...
4	...	80	55	...
5	...	80	55	...
6	...	80	55	...
7	...	80	55	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding									
Line No.	100	150	200	250	300	350	400	450	500
	Nonferrous Materials (Cont'd)								
1	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2
2	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2
3	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2
4	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2
5	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2
6	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2
7	55.0	43.1	37.5	33.1	29.6	26.8	24.6	22.7	21.2

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding										
Line No.	550	600	650	700	750	800	850	900	950	1000
	Nonferrous Materials (Cont'd)									
1	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...
2	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...
3	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...
4	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...
5	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...
6	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...
7	19.9	18.7	17.8	17.1	16.7	16.7	...	...	...	...

Table Y-1 (Cont'd)
Yield Strength Values, S_y , for Ferrous and Nonferrous Materials

Yield Strength, ksi (Multiply by 1000 to Obtain psi), for Metal Temperature, °F, Not Exceeding													
Line No.	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
	Nonferrous Materials (Cont'd)												
1	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...

NOTES TO TABLE Y-1**GENERAL NOTES**

- (a) The following abbreviations are used: ann., annealed; cond., condenser; CW, cold worked; extr., extruded; fin., finished; fr., from; HW, Hot worked; NT, Normalized and tempered; QT, Quenched and tempered; rel., relieved; rld., rolled; Smls., Seamless; Sol., Solution; SR, stress relieved; treat, treated; and Wld., Welded.
- (b) The tabulated values of yield strength are those which the Committee believes are suitable for use in design calculations. At temperatures above room temperature, the yield strength values correspond to the yield strength trend curve adjusted to the minimum specified room temperature yield strength. The yield strength values do not correspond exactly to "minimum" or "average" as these terms are applied to a statistical treatment of a homogeneous set of data. Neither the ASME Material Specifications nor the rules of Sections I, III, VIII, or XII require elevated temperature testing for yield strengths of production material for use in Code components. It is not intended that results of such tests, if performed, be compared with these tabulated yield strength values for ASME Code acceptance/rejection purposes for materials. If some elevated temperature test results on production material appear lower than the tabulated values by a large amount (more than the typical variability of material and suggesting the possibility of some error), further investigation by retest or other means should be considered.
- (c) Notes limiting applications of these materials appear in Tables 1A, 1B, 2A, 2B, 3, 4, 5A, and 5B.
- (d) These values represent yield strength design values that are appropriate for use in any section of the ASME Boiler & Pressure Vessel Code in which the material is permitted and not otherwise restricted by applicability temperature limits, application limits, or notes.
- (e) Where specifications, grades, classes, and types are listed in this Table, and where the material specification in Section II, Part A or Part B is a dual-unit specification (e.g., SA-516/SA-516M), the values listed in this Table shall be applicable to either the customary U.S. version of the material specification or the SI units version of the material specification. For example, the values listed for SA-516 Grade 70 shall be used when SA-516M Grade 485 is used in construction.
- (f) The values in this Table may be interpolated to determine values for intermediate temperatures. The values at intermediate temperatures shall be rounded to the same number of decimal places as the value at the higher temperature between which values are being interpolated. The rounding rule is: when the next digit beyond the last place to be retained is less than 5, retain unchanged the digit in the last place retained; when the digit next beyond the last place to be retained is 5 or greater, increase by 1 the digit in the last place retained.
- (g) Where a size limit appears in the Size/Thickness column, the limit applies to the dimension appropriate to the product form: wall thickness of tubing, pipe, pipe fittings, and hollow forgings; thickness of plate, flat bar and forgings, and polygonal bar; diameter of solid bar and bolting; and thickest cross-section of other pressure parts, e.g., castings and forgings.

NOTE

- (1) Strength values for intermediate thickness may be interpolated.

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Table Y-2
Factors for Limiting Permanent Strain in
Austenitic Stainless Steels, High-Nickel
Alloy Steels, Nickel, Nickel Alloys, Copper,
and Copper Alloys

Strain, %	Factors
0.10	0.90
0.09	0.89
0.08	0.88
0.07	0.86
0.06	0.83
0.05	0.80
0.04	0.77
0.03	0.73
0.02	0.69
0.01	0.63

GENERAL NOTE: This Table lists multiplying factors that, when applied to the yield strength values shown in Table Y-1, will give a value that will result in lower levels of permanent strain. If this value is less than the maximum allowable stress value listed in Table 1A, Table 1B, Table 2A, Table 2B, Table 5A, or Table 5B, or the design stress intensity value listed in Table 2A or Table 2B, the lower value shall be used.

SUBPART 2

PHYSICAL PROPERTIES TABLES

INTRODUCTION

(23)

Section II, Part D, [Subpart 2](#) provides, to the extent possible, physical properties for most of the alloys used in Code construction. Included in this Subpart are tables of thermal expansion (instantaneous, mean, and linear), thermal conductivity and thermal diffusivity, and modulus of elasticity. These values are all listed as a function of temperature from 70°F to as high as 1,850°F. [Subpart 2](#) also contains tables of density and Poisson's ratio for ferrous and nonferrous alloys.

All of the properties provided in [Subpart 2](#) are considered typical. They are neither average nor minimum. Thermal-physical properties such as thermal expansion, thermal conductivity, and thermal diffusivity are affected more by alloy content than by crystal structure or heat treatment. Due to the permitted range for elements comprising alloys (specification ranges of chemical compositions), the thermal-physical properties described in [Tables TE-1](#) through [TE-5](#) and [Table TCD](#) should be considered to have an associated uncertainty of $\pm 10\%$.

Moduli of elasticity and Poisson's ratio are also typical values, but the values of modulus of elasticity, shown as a function of temperature in [Tables TM-1](#) through [TM-5](#), tend to be closer to average values since their temperature dependency is factored against an "average" room-temperature value.

The physical properties listed in this Subpart are for information only, unless invoked by a Boiler & Pressure Vessel Code (Sections I, III, IV, VIII, X, XI, and XII). When a user of the Code has data supporting the use of values different from those in this Subpart, such other values may be used in lieu of the values in this Subpart.

Values for temperatures between those tabulated may be obtained by linear interpolation.

For those alloys for which physical properties are not yet addressed in [Subpart 2](#), the user of the Code may use other authoritative sources for the needed information. In those instances, or when alternative values are used, the user is encouraged to submit the values and supporting data to the attention of the ASME Boiler and Pressure Vessel Committee II on Materials for its consideration in improving and revising the values in [Subpart 2](#). Information should be directed to:

Secretary
ASME Boiler and Pressure Vessel Committee II on
Materials
Two Park Avenue
New York, NY 10016-5990

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Table TE-1
Thermal Expansion for Ferrous Materials

Temperature, °F	Coefficients for Carbon and Low Alloy Steels (Group 1) [Note (1)]			Coefficients for Other Alloy Steels (Group 2) [Note (2)]			Coefficients for 5Cr-1Mo and 29Cr-7Ni-2Mo-N Steels		
	A	B	C	A	B	C	A	B	C
70	6.4	6.4	0	7.0	7.0	0	6.4	6.4	0
100	6.6	6.5	0.23	7.1	7.1	0.26	6.6	6.5	0.23
150	6.8	6.6	0.63	7.3	7.2	0.69	6.8	6.6	0.63
200	7.0	6.7	1.0	7.5	7.3	1.1	7.0	6.7	1.0
250	7.2	6.8	1.5	7.6	7.3	1.6	7.1	6.8	1.5
300	7.3	6.9	1.9	7.8	7.4	2.0	7.2	6.9	1.9
350	7.5	7.0	2.4	7.9	7.5	2.5	7.3	6.9	2.3
400	7.7	7.1	2.8	8.0	7.6	3.0	7.3	7.0	2.8
450	7.8	7.2	3.3	8.1	7.6	3.5	7.4	7.0	3.2
500	8.0	7.3	3.7	8.3	7.7	4.0	7.4	7.1	3.7
550	8.2	7.3	4.2	8.4	7.8	4.5	7.5	7.1	4.1
600	8.3	7.4	4.7	8.4	7.8	5.0	7.6	7.2	4.6
650	8.5	7.5	5.2	8.5	7.9	5.5	7.7	7.2	5.0
700	8.7	7.6	5.7	8.6	7.9	6.0	7.7	7.2	5.5
750	8.8	7.7	6.3	8.7	8.0	6.5	7.8	7.3	5.9
800	9.0	7.8	6.8	8.8	8.0	7.0	7.9	7.3	6.4
850	9.1	7.9	7.4	8.8	8.1	7.6	8.0	7.4	6.9
900	9.2	7.9	7.9	8.9	8.1	8.1	8.1	7.4	7.4
950	9.3	8.0	8.5	9.0	8.2	8.6	8.1	7.4	7.9
1,000	9.4	8.1	9.0	9.0	8.2	9.2	8.2	7.5	8.4
1,050	9.4	8.1	9.6	9.0	8.3	9.7	8.3	7.5	8.8
1,100	9.5	8.2	10.1	9.1	8.3	10.3	8.3	7.6	9.3
1,150	9.5	8.3	10.7	9.1	8.3	10.8	8.4	7.6	9.8
1,200	9.5	8.3	11.3	9.1	8.4	11.4	8.4	7.6	10.3
1,250	9.5	8.4	11.9	9.1	8.4	11.9	8.5	7.7	10.9
1,300	9.5	8.4	12.4	9.1	8.4	12.5	8.6	7.7	11.4
1,350	...	...	...	9.1	8.5	13.0	8.7	7.7	11.9
1,400	...	...	...	9.0	8.5	13.5	8.9	7.8	12.4
1,450	...	...	...	8.9	8.5	14.1	...	...	...
1,500	...	...	...	8.8	8.5	14.6	...	...	...

Table TE-1
Thermal Expansion for Ferrous Materials (Cont'd)

Temperature, °F	Coefficients for 9Cr-1Mo Steels (Including Grades 9, 91, 911, and 92)			Coefficients for 5Ni- $\frac{1}{4}$ Mo Steels			Coefficients for 7Ni Steels		
	A	B	C	A	B	C	A	B	C
70	5.8	5.8	0	6.2	6.2	0	5.9	5.9	0
100	5.9	5.9	0.21	6.4	6.3	0.23	6.1	6.0	0.22
150	6.1	5.9	0.57	6.6	6.4	0.61	6.3	6.1	0.59
200	6.2	6.0	0.94	6.8	6.5	1.0	6.6	6.2	0.97
250	6.3	6.1	1.3	6.9	6.6	1.4	6.8	6.4	1.4
300	6.5	6.2	1.7	7.1	6.7	1.8	7.0	6.5	1.8
350	6.6	6.2	2.1	7.2	6.8	2.3	7.1	6.6	2.2
400	6.7	6.3	2.5	7.3	6.8	2.7	7.2	6.6	2.6
450	6.8	6.3	2.9	7.5	6.9	3.2	7.3	6.7	3.1
500	6.9	6.4	3.3	7.6	7.0	3.6	7.4	6.8	3.5
550	7.0	6.5	3.7	7.7	7.1	4.1	7.5	6.9	3.9
600	7.1	6.5	4.1	7.9	7.1	4.5	7.6	6.9	4.4
650	7.2	6.6	4.6	8.0	7.2	5.0	7.7	7.0	4.8
700	7.3	6.6	5.0	8.1	7.3	5.5	7.8	7.1	5.3
750	7.4	6.7	5.4	8.2	7.3	6.0	7.9	7.1	5.8
800	7.5	6.7	5.9	8.3	7.4	6.5	8.0	7.2	6.3
850	7.5	6.8	6.3	8.4	7.5	7.0	8.1	7.2	6.7
900	7.6	6.8	6.8	8.5	7.5	7.5	8.1	7.3	7.2
950	7.7	6.9	7.3	8.6	7.6	8.0	8.0	7.3	7.7
1,000	7.8	6.9	7.7	8.7	7.6	8.5	7.8	7.3	8.2
1,050	7.9	7.0	8.2	8.8	7.7	9.1	...	...	...
1,100	8.1	7.0	8.7	9.0	7.8	9.6	...	...	...
1,150	8.2	7.1	9.2	9.3	7.8	10.1	...	...	...
1,200	8.4	7.1	9.7	9.7	7.9	10.7	...	...	...
1,250	8.6	7.2	10.2	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...

Table TE-1
Thermal Expansion for Ferrous Materials (Cont'd)

Temperature, °F	Coefficients for 8Ni and 9Ni Steels			Coefficients for 12Cr, 12Cr-1Al, 13Cr, and 13Cr-4Ni Steels			Coefficients for 15Cr and 17Cr Steels		
	A	B	C	A	B	C	A	B	C
70	5.5	5.5	0	5.9	5.9	0	5.3	5.3	0
100	5.7	5.6	0.20	6.1	6.0	0.22	5.4	5.4	0.19
150	6.0	5.8	0.56	6.2	6.1	0.59	5.6	5.5	0.53
200	6.3	5.9	0.92	6.4	6.2	0.97	5.7	5.5	0.86
250	6.6	6.1	1.3	6.5	6.2	1.3	5.8	5.6	1.2
300	6.8	6.2	1.7	6.6	6.3	1.7	6.0	5.7	1.6
350	6.9	6.3	2.1	6.6	6.4	2.1	6.1	5.7	1.9
400	7.0	6.4	2.5	6.7	6.4	2.5	6.2	5.8	2.3
450	7.1	6.5	3.0	6.7	6.4	2.9	6.3	5.8	2.7
500	7.1	6.6	3.4	6.8	6.5	3.3	6.4	5.9	3.0
550	7.2	6.6	3.8	6.8	6.5	3.7	6.4	6.0	3.4
600	7.2	6.7	4.2	6.9	6.5	4.2	6.5	6.0	3.8
650	7.3	6.7	4.7	6.9	6.6	4.6	6.6	6.0	4.2
700	7.4	6.8	5.1	7.0	6.6	5.0	6.6	6.1	4.6
750	7.5	6.8	5.6	7.1	6.6	5.4	6.7	6.1	5.0
800	7.6	6.9	6.0	7.1	6.7	5.8	6.7	6.2	5.4
850	7.7	6.9	6.5	7.2	6.7	6.3	6.8	6.2	5.8
900	7.6	7.0	6.9	7.2	6.7	6.7	6.8	6.2	6.2
950	7.3	7.0	7.4	7.3	6.8	7.1	6.8	6.3	6.6
1,000	6.8	7.0	7.8	7.3	6.8	7.6	6.8	6.3	7.0
1,050	...	...	...	7.4	6.8	8.0	6.9	6.3	7.4
1,100	...	...	...	7.4	6.8	8.5	6.9	6.4	7.9
1,150	...	...	...	7.4	6.9	8.9	7.0	6.4	8.3
1,200	...	...	...	7.4	6.9	9.4	7.0	6.4	8.7
1,250	...	...	...	7.4	6.9	9.8	7.1	6.4	9.1
1,300	...	...	...	7.4	6.9	10.2	7.2	6.5	9.5
1,350	...	...	...	7.4	7.0	10.7	7.4	6.5	10.0
1,400	...	...	...	7.5	7.0	11.1	7.6	6.5	10.4
1,450	...	...	...	7.5	7.0	11.6	7.9	6.6	10.9
1,500	...	...	...	7.6	7.0	12.0	8.3	6.6	11.4

Table TE-1
Thermal Expansion for Ferrous Materials (Cont'd)

Temperature, °F	Coefficients for 27Cr Steels			Coefficients for Austenitic Stainless Steels (Group 3) [Note (3)]			Coefficients for Other Austenitic Stainless Steels (Group 4) [Note (4)]		
	A	B	C	A	B	C	A	B	C
70	5.0	5.0	0	8.5	8.5	0	8.2	8.2	0
100	5.1	5.1	0.18	8.7	8.6	0.31	8.3	8.2	0.30
150	5.2	5.1	0.49	9.0	8.8	0.84	8.6	8.4	0.81
200	5.3	5.2	0.81	9.4	8.9	1.4	8.8	8.5	1.3
250	5.3	5.2	1.1	9.6	9.1	2.0	9.0	8.6	1.9
300	5.4	5.2	1.4	9.9	9.2	2.5	9.2	8.7	2.4
350	5.4	5.3	1.8	10.1	9.4	3.1	9.3	8.8	3.0
400	5.5	5.3	2.1	10.2	9.5	3.8	9.4	8.9	3.5
450	5.6	5.3	2.4	10.4	9.6	4.4	9.5	9.0	4.1
500	5.6	5.4	2.8	10.5	9.7	5.0	9.6	9.1	4.7
550	5.7	5.4	3.1	10.6	9.8	5.6	9.7	9.1	5.3
600	5.8	5.4	3.5	10.6	9.9	6.3	9.8	9.2	5.8
650	5.9	5.5	3.8	10.7	9.9	6.9	9.9	9.2	6.4
700	6.0	5.5	4.2	10.8	10.0	7.5	10.0	9.3	7.0
750	6.1	5.5	4.5	10.8	10.0	8.2	10.1	9.3	7.6
800	6.2	5.6	4.9	10.9	10.1	8.8	10.2	9.4	8.2
850	6.2	5.6	5.3	11.0	10.2	9.5	10.3	9.4	8.8
900	6.3	5.7	5.6	11.1	10.2	10.2	10.4	9.5	9.5
950	6.4	5.7	6.0	11.2	10.3	10.8	10.5	9.6	10.1
1,000	6.4	5.7	6.4	11.4	10.3	11.5	10.6	9.6	10.7
1,050	6.5	5.8	6.8	11.5	10.4	12.2	10.7	9.7	11.4
1,100	6.5	5.8	7.2	11.7	10.4	12.9	10.9	9.7	12.0
1,150	6.5	5.8	7.6	11.8	10.5	13.6	11.0	9.8	12.7
1,200	6.5	5.9	8.0	12.0	10.6	14.3	11.1	9.8	13.3
1,250	6.6	5.9	8.4	12.0	10.6	15.0	11.3	9.9	14.0
1,300	6.7	5.9	8.7	12.0	10.7	15.8	11.4	9.9	14.7
1,350	6.8	6.0	9.2	11.9	10.7	16.5	11.5	10.0	15.4
1,400	7.0	6.0	9.6	11.7	10.8	17.2	11.7	10.1	16.1
1,450	7.3	6.0	10.0	11.2	10.8	17.9	11.8	10.1	16.8
1,500	7.7	6.1	10.4	10.5	10.8	18.5	12.0	10.2	17.5

Table TE-1
Thermal Expansion for Ferrous Materials (Cont'd)

Temperature, °F	Coefficients for Ductile Cast Iron			Coefficients for Precipitation Hardened 17Cr-4Ni-4Cu Stainless Steels, Condition 1075			Coefficients for Precipitation Hardened 17Cr-4Ni-4Cu Stainless Steels, Condition 1150		
	A	B	C	A	B	C	A	B	C
70	5.7	5.7	0	6.2	6.2	0	6.4	6.4	0
100	5.8	5.8	0.21	6.2	6.2	0.22	6.5	6.4	0.23
150	6.1	5.9	0.57	6.3	6.3	0.60	6.6	6.5	0.62
200	6.3	6.0	0.94	6.3	6.3	0.98	6.8	6.6	1.0
250	6.6	6.1	1.3	6.3	6.3	1.4	6.9	6.7	1.4
300	6.9	6.3	1.7	6.4	6.4	1.8	7.1	6.7	1.9
350	7.2	6.4	2.2	6.4	6.4	2.2	7.2	6.8	2.3
400	7.4	6.6	2.6	6.5	6.5	2.6	7.3	6.9	2.7
450	7.6	6.7	3.1	6.5	6.5	3.0	7.4	6.9	3.2
500	7.7	6.8	3.5	6.5	6.5	3.4	7.5	7.0	3.6
550	7.8	6.9	4.0	6.6	6.6	3.8	7.5	7.0	4.1
600	7.9	7.0	4.5	6.6	6.6	4.2	7.5	7.1	4.5
650	7.9	7.1	4.9	6.7	6.7	4.6	7.6	7.1	5.0
700	8.0	7.1	5.4	6.7	6.7	5.1	7.6	7.2	5.4
750	8.0	7.2	5.9	6.7	6.7	5.5	7.6	7.2	5.9
800	8.1	7.3	6.4	6.8	6.8	5.9	7.6	7.2	6.3
850	8.1	7.3	6.8	...	...	...	7.7	7.2	6.8
900	8.3	7.4	7.3	...	...	...	7.8	7.3	7.2
950	8.5	7.4	7.8	...	...	...	8.0	7.3	7.7
1,000	8.7	7.5	8.4	...	...	...	8.4	7.4	8.2
1,050	...	...	...	...	...	...	...	...	...
1,100	...	...	...	...	...	...	...	...	...
1,150	...	...	...	...	...	...	...	...	...
1,200	...	...	...	...	...	...	...	...	...
1,250	...	...	...	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...

GENERAL NOTE: Coefficient A is the instantaneous coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F). Coefficient B is the mean coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F) in going from 70°F to indicated temperature. Coefficient C is the linear thermal expansion (in./100 ft) in going from 70°F to indicated temperature.

NOTES:

(1) Group 1 alloys (by nominal composition):

Carbon steel	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}$	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$
C-Mn-Cb	$1\frac{1}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Cu}-\text{Mo}$
C-Mn-Si-Cb	$1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Cu}$	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Mo}-\frac{1}{3}\text{Cr}-\text{V}$
C-Mn-Si-V	$1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{Ti}$	$\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Mo}-\text{Cr}-\text{V}$
C-Mn-Ti	$2\text{Cr}-\frac{1}{2}\text{Mo}$	$\frac{3}{4}\text{Ni}-1\text{Mo}-\frac{3}{4}\text{Cr}$
C-Si-Ti	$2\frac{1}{4}\text{Cr}-1\text{Mo}$	$1\text{Ni}-\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$
C- $\frac{1}{4}\text{Mo}$	$3\text{Cr}-1\text{Mo}$	$1\frac{1}{4}\text{Ni}-1\text{Cr}-\frac{1}{2}\text{Mo}$
C- $\frac{1}{2}\text{Mo}$	$3\text{Cr}-1\text{Mo}-\frac{1}{4}\text{V}-\text{Cb}-\text{Ca}$	$1\frac{3}{4}\text{Ni}-\frac{3}{4}\text{Cr}-\frac{1}{4}\text{Mo}$
$\frac{1}{2}\text{Cr}-\frac{1}{5}\text{Mo}$	$3\text{Cr}-1\text{Mo}-\frac{1}{4}\text{V}-\text{Ti}-\text{B}$	$2\text{Ni}-\frac{3}{4}\text{Cr}-\frac{1}{4}\text{Mo}$
$\frac{1}{2}\text{Cr}-\frac{1}{5}\text{Mo}-\text{V}$	$\text{Mn}-\frac{1}{4}\text{Mo}$	$2\text{Ni}-\frac{3}{4}\text{Cr}-\frac{1}{3}\text{Mo}$
$\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{Si}$	$\text{Mn}-\frac{1}{2}\text{Mo}$	$2\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$
$\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}$	$\text{Mn}-\frac{1}{2}\text{Mo}-\frac{1}{4}\text{Ni}$	$2\frac{1}{2}\text{Ni}$
$\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Ni}-\text{Cu}$	$\text{Mn}-\frac{1}{2}\text{Mo}-\frac{1}{2}\text{Ni}$	$2\frac{3}{4}\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$
$\frac{3}{4}\text{Cr}-\frac{3}{4}\text{Ni}-\text{Cu}-\text{Al}$	$\text{Mn}-\frac{1}{2}\text{Mo}-\frac{3}{4}\text{Ni}$	$3\frac{1}{2}\text{Ni}$
$1\text{Cr}-\frac{1}{5}\text{Mo}$	$\text{Mn}-\text{V}$	$3\frac{1}{2}\text{Ni}-1\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$
$1\text{Cr}-\frac{1}{5}\text{Mo}-\text{Si}$	$\frac{1}{2}\text{Ni}-\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}$	$4\text{Ni}-1\frac{1}{2}\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$
$1\text{Cr}-\frac{1}{2}\text{Mo}$	$\frac{1}{2}\text{Ni}-\frac{1}{2}\text{Cr}-\frac{1}{4}\text{Mo}-\text{V}$	
$1\text{Cr}-\frac{1}{2}\text{Mo}-\text{V}$	$\frac{1}{2}\text{Ni}-\frac{1}{2}\text{Mo}-\text{V}$	

NOTES (CONT'D):

(2) Group 2 alloys (by nominal composition):

18Cr-5Ni-3Mo-N	23Cr-4Ni-Mo-Cu	27Cr-7.5Ni-4.5Mo-Co-N
22Cr-2Ni-Mo-N	25Cr-6Ni-Mo-N	
22Cr-5Ni-3Mo-N	25Cr-7Ni-4Mo-N	

(3) Group 3 alloys (by nominal composition):

16Cr-12Ni-2Mo	18Cr-10Ni-Cb	18Cr-18Ni-2Si
16Cr-12Ni-2Mo-N	18Cr-10Ni-Ti	19Cr-9Ni-Mo-W
16Cr-12Ni-2Mo-Ti	18Cr-11Ni	21Cr-11Ni-N
18Cr-8Ni	18Cr-13Ni-3Mo	
18Cr-8Ni-N	18Cr-15Ni-4Si	

(4) Group 4 alloys (by nominal composition):

14Cr-16Ni-6Si-Cu-Mo	22Cr-13Ni-5Mn	25Cr-20Ni-2Mo
25Ni-15Cr-2Ti	23Cr-12Ni	31Ni-31Fe-29Cr-Mo
29Ni-20Cr-3Cu-2Mo	24Cr-22Ni-6Mo-2W-Cu-N	44Fe-25Ni-21Cr-Mo
18Cr-20Ni-5.5Si	25Cr-12Ni	47Fe-25Ni-23Cr-5.5Mo-N
20Cr-18Ni-6Mo	25Cr-20Ni	

Table TE-2
Thermal Expansion for Aluminum Alloys

Temperature, °F	Coefficients for Aluminum Alloys		
	A	B	C
70	12.1	12.1	0
100	12.6	12.4	0.45
150	13.2	12.7	1.2
200	13.5	13.0	2.0
250	13.7	13.1	2.8
300	14.0	13.3	3.7
350	14.3	13.4	4.5
400	14.7	13.6	5.4
450	15.1	13.8	6.3
500	15.3	13.9	7.2
550	15.4	14.1	8.1
600	15.2	14.2	9.0

GENERAL NOTES:

- (a) Aluminum alloys represented by these thermal expansion coefficients include:

A03560	A93003	A95254
A24430	A93004	A95454
A91060	A95052	A95456
A91100	A95083	A95652
A92014	A95086	A96061
A92024	A95154	A96063

- (b) Coefficient A is the instantaneous coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F). Coefficient B is the mean coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F) in going from 70°F to indicated temperature. Coefficient C is the linear thermal expansion (in./100 ft) in going from 70°F to indicated temperature.

Table TE-3
Thermal Expansion for Copper Alloys

Temperature, °F	Coefficients for Copper Alloys, C1XXXX Series			Coefficients for Bronze Alloys [Note (1)]			Coefficients for Brass Alloys [Note (2)]			Coefficients for Copper-Nickel (70Cu-30Ni) [Note (3)]			Coefficients for Copper-Nickel (90Cu-10Ni) [Note (4)]		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
70	9.3	9.3	0	9.6	9.6	0	9.3	9.3	0	8.1	8.1	0	...	...	...
100	9.5	9.4	0.34	9.8	9.7	0.35	9.6	9.4	0.34	8.3	8.2	0.30	...	...	...
150	9.6	9.5	0.91	10.1	9.9	0.95	9.9	9.6	0.92	8.6	8.4	0.81	...	...	...
200	9.7	9.6	1.5	10.2	10.0	1.6	10.1	9.8	1.5	8.8	8.5	1.3	...	...	...
250	9.9	9.6	2.1	10.3	10.1	2.2	10.3	9.9	2.1	9.0	8.6	1.9	...	...	...
300	10.0	9.7	2.7	10.4	10.1	2.8	10.5	10.0	2.8	9.2	8.7	2.4	...	...	...
350	10.1	9.8	3.3	10.4	10.2	3.4	10.8	10.1	3.4	9.4	8.8	3.0	...	...	...
400	10.2	9.8	3.9	10.5	10.2	4.0	11.1	10.2	4.1	9.5	8.9	3.5	...	...	...
450	10.3	9.9	4.5	10.6	10.3	4.7	11.3	10.4	4.7	9.7	9.0	4.1	...	...	...
500	10.3	9.9	5.1	10.8	10.3	5.3	11.5	10.5	5.4	9.7	9.1	4.7	...	...	...
550	10.3	10.0	5.7	10.9	10.4	6.0	11.6	10.6	6.1	9.6	9.1	5.3	9.5	9.5	5.5
600	10.4	10.0	6.4	11.0	10.4	6.6	11.7	10.7	6.8	9.5	9.2	5.8	...	...	...
650	...	...	...	11.1	10.5	7.3	11.9	10.8	7.5	9.3	9.2	6.4	...	...	...
700	...	...	...	11.1	10.5	8.0	12.2	10.9	8.2	9.2	9.2	7.0	...	...	...
750	...	...	...	11.1	10.6	8.6	13.0	11.0	9.0	...	...	...	...	...	...
800	...	...	...	11.0	10.6	9.3	14.5	11.2	9.8	...	...	...	...	...	...

GENERAL NOTE: Coefficient A is the instantaneous coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F). Coefficient B is the mean coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F) in going from 70°F to indicated temperature. Coefficient C is the linear thermal expansion (in./100 ft) in going from 70°F to indicated temperature.

NOTES:

- (1) Includes C6XXXX, C8XXXX, C92XXX, C93XXX, and C95XXX alloys.
- (2) Includes C2XXXX, C3XXXX, and C4XXXX alloys.
- (3) Includes C71XXX, C72XXX, and C97600 alloys.
- (4) Includes C70XXX and C96200 alloys.

Table TE-4
Thermal Expansion for Nickel Alloys

Temperature, °F	Coefficients for N02200 and N02201			Coefficients for N04400 and N04405			Coefficients for N06002		
	A	B	C	A	B	C	A	B	C
70	6.6	6.6	0	7.7	7.7	0	7.3	7.3	0
100	6.9	6.8	0.24	7.9	7.8	0.28	7.4	7.4	0.27
150	7.3	7.0	0.67	8.2	7.9	0.76	7.6	7.4	0.71
200	7.7	7.2	1.1	8.4	8.1	1.3	7.7	7.5	1.2
250	7.9	7.4	1.6	8.6	8.2	1.8	7.8	7.6	1.6
300	8.1	7.5	2.1	8.8	8.3	2.3	7.9	7.6	2.1
350	8.2	7.6	2.6	8.9	8.4	2.8	7.9	7.7	2.6
400	8.3	7.7	3.1	9.1	8.5	3.4	8.0	7.7	3.1
450	8.4	7.8	3.6	9.1	8.6	3.9	8.2	7.8	3.5
500	8.5	7.9	4.1	9.2	8.7	4.5	8.3	7.8	4.0
550	8.7	8.0	4.6	9.3	8.7	5.0	8.4	7.9	4.5
600	8.8	8.0	5.1	9.3	8.8	5.6	8.6	7.9	5.0
650	8.9	8.1	5.6	9.3	8.8	6.1	8.7	8.0	5.6
700	9.0	8.2	6.2	9.4	8.9	6.7	8.9	8.1	6.1
750	9.1	8.2	6.7	9.4	8.9	7.3	9.1	8.1	6.6
800	9.2	8.3	7.3	9.4	8.9	7.8	9.2	8.2	7.2
850	9.3	8.4	7.8	9.5	9.0	8.4	9.4	8.3	7.7
900	9.4	8.4	8.4	9.5	9.0	9.0	9.6	8.3	8.3
950	9.5	8.5	9.0	9.5	9.0	9.5	9.7	8.4	8.9
1,000	9.5	8.5	9.5	9.6	9.1	10.1	9.8	8.5	9.5
1,050	9.6	8.6	10.1	9.6	9.1	10.7	10.0	8.6	10.1
1,100	9.6	8.6	10.7	9.7	9.1	11.3	10.1	8.6	10.7
1,150	9.7	8.7	11.3	9.7	9.1	11.8	10.2	8.7	11.3
1,200	9.7	8.7	11.8	9.8	9.2	12.4	10.3	8.8	11.9
1,250	9.8	8.8	12.4	9.9	9.2	13.0	10.4	8.8	12.5
1,300	10.0	8.8	13.0	9.9	9.2	13.6	10.5	8.9	13.1
1,350	10.2	8.9	13.6	10.0	9.2	14.2	10.7	9.0	13.8
1,400	10.6	8.9	14.2	10.0	9.3	14.8	10.9	9.0	14.4
1,450	...	...	...	10.0	9.3	15.4	11.2	9.1	15.1
1,500	...	...	...	10.1	9.3	16.0	11.7	9.2	15.8
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N06007			Coefficients for N06022			Coefficients for N06030		
	A	B	C	A	B	C	A	B	C
70	7.4	7.4	0	6.9	6.9	0	6.7	6.7	0
100	7.5	7.4	0.27	6.9	6.9	0.25	6.9	6.8	0.24
150	7.5	7.5	0.72	6.9	6.9	0.66	7.3	7.0	0.67
200	7.6	7.5	1.2	6.9	6.9	1.1	7.6	7.1	1.1
250	7.7	7.5	1.6	6.9	6.9	1.5	7.8	7.3	1.6
300	7.7	7.6	2.1	6.9	6.9	1.9	8.0	7.4	2.1
350	7.8	7.6	2.6	6.9	6.9	2.3	8.2	7.6	2.5
400	8.0	7.7	3.0	7.0	6.9	2.7	8.4	7.7	3.0
450	8.1	7.7	3.5	7.1	6.9	3.2	8.5	7.8	3.5
500	8.3	7.8	4.0	7.3	7.0	3.6	8.6	7.9	4.1
550	8.6	7.8	4.5	7.4	7.0	4.0	8.7	8.0	4.6
600	8.8	7.9	5.0	7.6	7.0	4.5	8.8	8.0	5.1
650	9.0	8.0	5.6	7.8	7.1	4.9	8.9	8.1	5.6
700	9.3	8.1	6.1	8.1	7.2	5.4	9.0	8.2	6.2
750	9.5	8.2	6.7	8.3	7.2	5.9	9.1	8.2	6.7
800	9.8	8.3	7.3	8.6	7.3	6.4	9.3	8.3	7.3
850	10.0	8.4	7.9	8.8	7.4	6.9	9.4	8.4	7.8
900	10.1	8.5	8.5	9.1	7.5	7.5	9.6	8.4	8.4
950	10.2	8.6	9.1	9.3	7.6	8.0	9.8	8.5	9.0
1,000	10.3	8.7	9.7	9.6	7.7	8.6	10.0	8.6	9.6
1,050	10.4	8.8	10.3	9.8	7.8	9.2	10.1	8.7	10.2
1,100	10.4	8.8	10.9	10.0	7.9	9.8	10.2	8.7	10.8
1,150	10.4	8.9	11.6	10.2	8.0	10.4	10.2	8.8	11.4
1,200	10.3	9.0	12.2	10.4	8.1	11.0	10.1	8.9	12.0
1,250	10.4	9.0	12.8	10.5	8.2	11.6	9.7	8.9	12.6
1,300	10.5	9.1	13.4	10.7	8.3	12.2	9.2	8.9	13.2
1,350	10.7	9.2	14.1	10.9	8.4	12.9	8.3	8.9	13.7
1,400	11.1	9.2	14.7	11.2	8.5	13.6	7.0	8.9	14.2
1,450	11.8	9.3	15.4	11.5	8.6	14.2	...	...	...
1,500	12.9	9.4	16.1	11.9	8.7	14.9	...	...	...
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N06045			Coefficients for N06059 and N06686			Coefficients for N06230		
	A	B	C	A	B	C	A	B	C
70	6.1	6.1	0	6.5	6.5	0	6.9	6.9	0
100	6.6	6.4	0.23	6.5	6.5	0.23	6.9	6.9	0.25
150	7.4	6.8	0.65	6.6	6.5	0.62	7.0	6.9	0.66
200	8.0	7.1	1.1	6.7	6.6	1.0	7.1	7.0	1.1
250	8.3	7.4	1.6	6.8	6.6	1.4	7.2	7.0	1.5
300	8.6	7.7	2.1	6.9	6.7	1.8	7.3	7.1	2.0
350	8.8	7.8	2.6	7.0	6.7	2.3	7.4	7.1	2.4
400	8.8	8.0	3.2	7.1	6.8	2.7	7.5	7.2	2.8
450	8.9	8.1	3.7	7.2	6.8	3.1	7.6	7.2	3.3
500	8.9	8.2	4.2	7.2	6.9	3.6	7.7	7.3	3.7
550	8.9	8.3	4.8	7.3	6.9	4.0	7.9	7.3	4.2
600	8.9	8.3	5.3	7.3	7.0	4.4	8.0	7.4	4.7
650	9.0	8.4	5.8	7.3	7.0	4.9	8.1	7.4	5.2
700	9.1	8.4	6.4	7.4	7.0	5.3	8.3	7.5	5.7
750	9.2	8.5	6.9	7.4	7.0	5.7	8.4	7.6	6.2
800	9.3	8.5	7.5	7.5	7.1	6.2	8.5	7.6	6.7
850	9.5	8.6	8.0	7.6	7.1	6.6	8.7	7.7	7.2
900	9.7	8.7	8.6	7.7	7.1	7.1	8.8	7.7	7.7
950	9.9	8.7	9.2	7.7	7.2	7.6	8.9	7.8	8.2
1,000	10.1	8.8	9.8	7.6	7.2	8.0	8.9	7.9	8.8
1,050	10.3	8.9	10.4	7.3	7.2	8.5	9.0	7.9	9.3
1,100	10.5	8.9	11.0	...	7.2	8.9	9.1	8.0	9.9
1,150	10.7	9.0	11.7	...	...	...	9.1	8.0	10.4
1,200	10.8	9.1	12.3	...	...	...	9.2	8.1	11.0
1,250	10.9	9.2	13.0	...	...	...	9.3	8.1	11.5
1,300	11.0	9.2	13.6	...	...	...	9.3	8.2	12.1
1,350	11.0	9.3	14.3	...	...	...	9.5	8.2	12.6
1,400	11.0	9.4	15.0	...	...	...	9.6	8.3	13.2
1,450	11.0	9.4	15.6	...	...	...	9.9	8.3	13.8
1,500	11.1	9.5	16.3	...	...	...	10.2	8.4	14.4
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N06455			Coefficients for N06600			Coefficients for N06625		
	A	B	C	A	B	C	A	B	C
70	5.8	5.8	0	6.8	6.8	0	6.7	6.7	0
100	6.0	5.9	0.21	7.0	6.9	0.25	6.9	6.8	0.24
150	6.2	6.0	0.58	7.2	7.0	0.67	7.2	7.0	0.67
200	6.5	6.2	0.97	7.4	7.1	1.1	7.4	7.1	1.1
250	6.8	6.3	1.4	7.6	7.2	1.6	7.4	7.2	1.6
300	7.0	6.4	1.8	7.7	7.3	2.0	7.5	7.2	2.0
350	7.2	6.5	2.2	7.9	7.4	2.5	7.5	7.3	2.4
400	7.4	6.7	2.6	8.0	7.5	3.0	7.5	7.3	2.9
450	7.5	6.8	3.1	8.2	7.6	3.5	7.5	7.3	3.3
500	7.7	6.9	3.5	8.3	7.6	3.9	7.5	7.4	3.8
550	7.7	7.0	4.0	8.4	7.7	4.4	7.6	7.4	4.2
600	7.8	7.0	4.5	8.5	7.8	5.0	7.7	7.4	4.7
650	7.9	7.1	4.9	8.6	7.9	5.5	7.8	7.4	5.2
700	7.9	7.2	5.4	8.7	7.9	6.0	8.0	7.5	5.6
750	7.9	7.2	5.9	8.8	8.0	6.5	8.2	7.5	6.1
800	7.9	7.3	6.4	8.9	8.0	7.0	8.4	7.6	6.6
850	7.9	7.3	6.8	9.1	8.1	7.6	8.7	7.6	7.1
900	7.9	7.3	7.3	9.2	8.2	8.1	8.9	7.7	7.7
950	7.9	7.4	7.8	9.3	8.2	8.7	9.1	7.8	8.2
1,000	8.0	7.4	8.3	9.5	8.3	9.3	9.4	7.9	8.8
1,050	8.0	7.4	8.7	9.7	8.4	9.8	9.6	7.9	9.3
1,100	8.0	7.5	9.2	9.9	8.4	10.4	9.8	8.0	9.9
1,150	8.1	7.5	9.7	10.1	8.5	11.0	9.9	8.1	10.5
1,200	8.1	7.5	10.2	10.3	8.6	11.6	10.1	8.2	11.1
1,250	8.1	7.5	10.7	10.5	8.6	12.2	10.2	8.3	11.7
1,300	8.1	7.6	11.2	10.6	8.7	12.9	10.4	8.4	12.3
1,350	8.0	7.6	11.7	10.8	8.8	13.5	10.5	8.4	13.0
1,400	7.9	7.6	12.1	11.0	8.9	14.2	10.7	8.5	13.6
1,450	7.6	7.6	12.6	11.1	9.0	14.8	10.9	8.6	14.2
1,500	7.2	7.6	13.0	11.1	9.0	15.5	11.3	8.7	14.9
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N06690			Coefficients for N07718			Coefficients for N07750		
	A	B	C	A	B	C	A	B	C
70	7.7	7.7	0	7.1	7.1	0	6.7	6.7	0
100	7.8	7.8	0.28	7.1	7.1	0.26	6.8	6.8	0.24
150	7.9	7.8	0.75	7.2	7.2	0.69	7.1	6.9	0.66
200	8.0	7.9	1.2	7.4	7.2	1.1	7.3	7.0	1.1
250	8.0	7.9	1.7	7.5	7.3	1.6	7.5	7.1	1.5
300	8.1	7.9	2.2	7.6	7.3	2.0	7.7	7.2	2.0
350	8.2	8.0	2.7	7.7	7.4	2.5	7.8	7.3	2.5
400	8.3	8.0	3.2	7.9	7.5	3.0	7.8	7.4	2.9
450	8.5	8.1	3.7	8.0	7.5	3.4	7.8	7.4	3.4
500	8.6	8.1	4.2	8.0	7.6	3.9	7.7	7.5	3.9
550	8.7	8.2	4.7	8.1	7.6	4.4	7.7	7.5	4.3
600	8.7	8.2	5.2	8.2	7.7	4.9	7.7	7.5	4.8
650	8.7	8.3	5.8	8.3	7.7	5.4	7.8	7.6	5.3
700	8.5	8.3	6.3	8.4	7.8	5.9	8.1	7.6	5.7
750	8.3	8.3	6.8	8.5	7.8	6.4	8.6	7.6	6.2
800	8.1	8.3	7.3	8.6	7.9	6.9	9.4	7.7	6.8
850	...	...	...	8.7	7.9	7.4	...	...	...
900	...	...	...	8.8	8.0	7.9	...	...	...
950	...	...	...	8.9	8.0	8.5	...	...	...
1,000	...	...	...	9.1	8.1	9.0	...	...	...
1,050	...	...	...	9.2	8.1	9.6	...	...	...
1,100	...	...	...	9.4	8.2	10.1	...	...	...
1,150	...	...	...	...	...	...	...	...	...
1,200	...	...	...	...	...	...	...	...	...
1,250	...	...	...	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N08031 and N08367			Coefficients for N08330			Coefficients for N08354		
	A	B	C	A	B	C	A	B	C
70	7.7	7.7	0	8.1	8.1	0	7.6	7.6	0
100	7.8	7.7	0.28	8.2	8.1	0.29	7.8	7.7	0.30
150	7.9	7.8	0.75	8.3	8.2	0.79	7.9	7.8	0.77
200	8.1	7.9	1.2	8.5	8.3	1.3	8.0	7.9	1.2
250	8.3	8.0	1.7	8.7	8.4	1.8	8.1	7.9	1.7
300	8.4	8.0	2.2	8.8	8.5	2.3	8.2	8.0	2.2
350	8.5	8.1	2.7	8.9	8.5	2.9	8.3	8.0	2.7
400	8.7	8.2	3.2	9.0	8.6	3.4	8.4	8.1	3.2
450	8.7	8.3	3.8	9.1	8.7	4.0	8.5	8.1	3.7
500	8.8	8.3	4.3	9.2	8.7	4.5	8.6	8.2	4.2
550	8.9	8.4	4.8	9.3	8.8	5.1	7.7	8.2	4.8
600	9.0	8.4	5.4	9.5	8.8	5.6	8.7	8.3	5.3
650	9.0	8.5	5.9	9.7	8.9	6.2	8.8	8.3	5.8
700	9.1	8.5	6.4	9.9	9.0	6.8	8.9	8.4	6.3
750	9.2	8.6	7.0	9.9	9.0	7.4	9.1	8.4	6.9
800	9.3	8.6	7.6	9.6	9.1	8.0	9.1	8.4	7.4
850	9.3	8.7	8.1	...	...	...	...	...	...
900	9.4	8.7	8.7	...	...	...	...	...	...
950	9.4	8.7	9.2	...	...	...	...	...	...
1,000	9.3	8.8	9.8	...	...	...	...	...	...
1,050	9.1	8.8	10.3	...	...	...	...	...	...
1,100	8.8	8.8	10.9	...	...	...	...	...	...
1,150	...	...	...	...	...	...	...	...	...
1,200	...	...	...	...	...	...	...	...	...
1,250	...	...	...	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N08800, N08801, N08810, and N08811			Coefficients for N08825			Coefficients for N10001		
	A	B	C	A	B	C	A	B	C
70	7.9	7.9	0	7.5	7.5	0	6.0	6.0	0
100	8.1	8.0	0.29	7.6	7.5	0.27	6.2	6.1	0.22
150	8.5	8.2	0.79	7.8	7.6	0.73	6.3	6.2	0.60
200	8.7	8.4	1.3	8.0	7.7	1.2	6.4	6.3	0.98
250	8.9	8.5	1.8	8.1	7.8	1.7	6.5	6.3	1.4
300	9.1	8.6	2.4	8.2	7.9	2.2	6.5	6.3	1.8
350	9.2	8.7	2.9	8.2	7.9	2.7	6.5	6.4	2.1
400	9.3	8.8	3.5	8.3	8.0	3.2	6.5	6.4	2.5
450	9.4	8.9	4.0	8.3	8.0	3.7	6.6	6.4	2.9
500	9.5	8.9	4.6	8.5	8.1	4.2	6.6	6.4	3.3
550	9.5	9.0	5.2	8.7	8.1	4.7	6.7	6.5	3.7
600	9.6	9.0	5.7	8.9	8.2	5.2	6.9	6.5	4.1
650	9.7	9.1	6.3	9.2	8.3	5.8	7.0	6.5	4.5
700	9.7	9.1	6.9	9.2	8.3	6.3	7.2	6.6	5.0
750	9.8	9.2	7.5	8.9	8.4	6.9	7.4	6.6	5.4
800	9.9	9.2	8.1	7.8	8.4	7.4	7.6	6.7	5.9
850	10.0	9.3	8.7	...	...	...	7.7	6.7	6.3
900	10.1	9.3	9.3	...	...	...	7.9	6.8	6.8
950	10.2	9.4	9.9	...	...	...	8.1	6.9	7.3
1,000	10.3	9.4	10.5	...	...	...	8.2	6.9	7.7
1,050	10.4	9.5	11.1	...	...	...	8.4	7.0	8.2
1,100	10.5	9.5	11.8	...	...	...	8.5	7.1	8.8
1,150	10.6	9.6	12.4	...	...	...	8.6	7.1	9.3
1,200	10.8	9.6	13.0	...	...	...	8.7	7.2	9.8
1,250	10.9	9.7	13.7	...	...	...	8.8	7.3	10.3
1,300	11.1	9.7	14.4	...	...	...	9.0	7.3	10.8
1,350	11.3	9.8	15.0	...	...	...	9.3	7.4	11.4
1,400	11.6	9.8	15.7	...	...	...	9.8	7.5	12.0
1,450	11.9	9.9	16.4	...	...	...	10.4	7.6	12.6
1,500	12.4	10.0	17.1	...	...	...	11.3	7.7	13.2
1,550	13.0	10.1	17.9	...	...	...	...	...	...
1,600	13.7	10.2	18.7	...	...	...	...	...	...
1,650	14.5	10.3	19.6	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N10003			Coefficients for N10242			Coefficients for N10276		
	A	B	C	A	B	C	A	B	C
70	6.2	6.2	0	5.8	5.8	0	6.0	6.0	0
100	6.3	6.2	0.22	5.9	5.8	0.21	6.1	6.1	0.22
150	6.5	6.3	0.60	6.0	5.9	0.57	6.4	6.2	0.60
200	6.6	6.4	1.0	6.2	6.0	0.94	6.6	6.3	0.98
250	6.8	6.5	1.4	6.4	6.1	1.3	6.8	6.4	1.4
300	6.9	6.6	1.8	6.5	6.1	1.7	7.0	6.5	1.8
350	7.0	6.6	2.2	6.7	6.2	2.1	7.2	6.6	2.2
400	7.0	6.7	2.6	6.8	6.3	2.5	7.3	6.7	2.7
450	7.1	6.7	3.1	6.9	6.4	2.9	7.5	6.8	3.1
500	7.1	6.8	3.5	7.0	6.5	3.3	7.7	6.9	3.6
550	7.2	6.8	3.9	7.0	6.5	3.8	7.8	7.0	4.0
600	7.4	6.9	4.4	7.0	6.6	4.2	7.9	7.1	4.5
650	7.6	6.9	4.8	7.0	6.6	4.6	8.0	7.1	5.0
700	7.7	7.0	5.3	7.0	6.6	5.0	8.1	7.2	5.5
750	7.8	7.0	5.7	7.0	6.7	5.4	8.2	7.3	5.9
800	7.7	7.1	6.2	7.0	6.7	5.8	8.3	7.4	6.4
850	...	...	...	7.0	6.7	6.3	8.4	7.4	6.9
900	...	...	...	7.0	6.7	6.7	8.5	7.5	7.5
950	...	...	...	7.2	6.7	7.1	8.6	7.5	8.0
1,000	...	...	...	7.3	6.8	7.5	8.7	7.6	8.5
1,050	...	...	...	7.6	6.8	8.0	8.8	7.7	9.0
1,100	...	...	...	8.0	6.8	8.5	8.9	7.7	9.5
1,150	...	...	...	8.4	6.9	9.0	8.9	7.8	10.1
1,200	...	...	...	9.0	7.0	9.5	9.0	7.8	10.6
1,250	...	...	...	9.8	7.1	10.0	9.1	7.9	11.2
1,300	...	...	...	10.6	7.2	10.6	9.2	7.9	11.7
1,350	...	...	...	11.7	7.4	11.3	9.2	8.0	12.3
1,400	...	...	...	12.9	7.6	12.1	9.3	8.0	12.8
1,450	...	...	...	14.2	7.8	12.9	9.2	8.1	13.4
1,500	...	...	...	15.8	8.0	13.8	9.2	8.1	13.9
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N10629			Coefficients for N10665			Coefficients for N10675		
	A	B	C	A	B	C	A	B	C
70	5.5	5.5	0	5.3	5.3	0	...	5.7	0
100	5.6	5.5	0.20	5.5	5.4	0.19	...	5.7	0.21
150	5.8	5.6	0.54	5.8	5.6	0.54	...	5.8	0.56
200	5.9	5.7	0.89	6.0	5.7	0.89	...	5.8	0.90
250	6.0	5.8	1.2	6.1	5.8	1.3	...	5.9	1.3
300	6.2	5.9	1.6	6.2	5.9	1.6	...	5.9	1.6
350	6.3	5.9	2.0	6.3	6.0	2.0	...	6.0	2.0
400	6.3	6.0	2.4	6.4	6.0	2.4	...	6.1	2.4
450	6.4	6.0	2.7	6.5	6.1	2.8	...	6.1	2.8
500	6.5	6.1	3.1	6.5	6.1	3.2	...	6.2	3.2
550	6.6	6.1	3.5	6.6	6.2	3.6	...	6.3	3.6
600	6.7	6.2	3.9	6.7	6.2	4.0	...	6.3	4.0
650	6.8	6.2	4.3	6.9	6.3	4.4	...	6.4	4.4
700	6.8	6.3	4.7	7.0	6.3	4.8	...	6.4	4.9
750	6.9	6.3	5.2	7.1	6.4	5.2	...	6.5	5.3
800	6.9	6.4	5.6	7.2	6.4	5.6	...	6.5	5.7
850	6.9	6.4	6.0	7.3	6.5	6.1	...	6.5	6.1
900	7.0	6.4	6.4	7.3	6.5	6.5	...	6.5	6.5
950	7.0	6.5	6.8	7.3	6.6	6.9	...	6.5	6.9
1,000	7.0	6.5	7.2	7.3	6.6	7.4	...	6.5	7.3
1,050	7.0	6.5	7.7	7.2	6.6	7.8	...	6.6	7.7
1,100	7.1	6.5	8.1	7.1	6.7	8.2	...	6.6	8.1
1,150	7.2	6.6	8.5	7.0	6.7	8.7	...	6.6	8.5
1,200	...	...	...	6.9	6.7	9.1	...	6.6	9.0
1,250	...	...	...	6.8	6.7	9.5	...	6.7	9.4
1,300	...	...	...	6.8	6.7	9.9	...	6.7	9.9
1,350	...	...	...	7.0	6.7	10.3	...	6.8	10.5
1,400	...	...	...	7.3	6.7	10.7	...	7.0	11.1
1,450	...	...	...	7.9	6.8	11.2	...	7.2	11.9
1,500	...	...	...	8.8	6.8	11.7	...	7.4	12.7
1,550	...	...	...	...	...	...	...	...	...
1,600	...	...	...	...	...	...	...	...	...
1,650	...	...	...	...	...	...	...	...	...

Table TE-4
Thermal Expansion for Nickel Alloys (Cont'd)

Temperature, °F	Coefficients for N12160			Coefficients for R20033		
	A	B	C	A	B	C
70	6.9	6.9	0	7.8	7.8	0
100	7.0	7.0	0.25	7.9	7.9	0.28
150	7.3	7.1	0.68	8.2	8.0	0.77
200	7.5	7.2	1.1	8.4	8.1	1.3
250	7.7	7.3	1.6	8.6	8.2	1.8
300	7.9	7.4	2.0	8.7	8.3	2.3
350	8.1	7.5	2.5	8.8	8.4	2.8
400	8.2	7.6	3.0	8.7	8.5	3.3
450	8.3	7.7	3.5	8.7	8.5	3.9
500	8.4	7.8	4.0	8.6	8.5	4.4
550	8.5	7.9	4.5	8.7	8.5	4.9
600	8.6	7.9	5.0	8.8	8.5	5.4
650	8.6	8.0	5.6	9.0	8.6	6.0
700	8.7	8.0	6.1	9.4	8.6	6.5
750	8.7	8.1	6.6	9.7	8.7	7.1
800	8.8	8.1	7.1	9.9	8.8	7.7
850	8.9	8.2	7.7	9.9	8.8	8.3
900	9.0	8.2	8.2	9.3	8.9	8.9
950	9.2	8.3	8.7	...	...	...
1,000	9.3	8.3	9.3	...	...	...
1,050	9.5	8.4	9.9	...	...	...
1,100	9.8	8.4	10.4	...	...	...
1,150	10.1	8.5	11.0	...	...	...
1,200	10.4	8.6	11.6	...	...	...
1,250	10.6	8.7	12.3	...	...	...
1,300	10.9	8.8	12.9	...	...	...
1,350	11.1	8.8	13.6	...	...	...
1,400	11.2	8.9	14.2	...	...	...
1,450	11.2	9.0	14.9	...	...	...
1,500	10.9	9.1	15.6	...	...	...
1,550	...	...	...	...	...	...
1,600	...	...	...	...	...	...
1,650	...	...	...	...	...	...

GENERAL NOTE: Coefficient A is the instantaneous coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F). Coefficient B is the mean coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F) in going from 70°F to indicated temperature. Coefficient C is the linear thermal expansion (in./100 ft) in going from 70°F to indicated temperature.

Table TE-5
Thermal Expansion for Titanium Alloys

Temperature, °F	Coefficients for Titanium Alloy, Grades 1, 2, 2H, 3, 7, 7H, 11, 12, 16, 16H, 17, 26, 26H, and 27			Coefficients for Titanium Alloy, Grades 9 and 28			Coefficients for Titanium Alloy, Grade 38		
	A	B	C	A	B	C	A	B	C
70	4.6	4.6	0	4.7	4.7	0	4.8	4.8	0
100	4.7	4.7	0.17	4.8	4.7	0.17	4.9	4.9	0.18
150	4.8	4.7	0.45	4.8	4.8	0.46	4.9	4.9	0.47
200	4.8	4.7	0.73	4.9	4.8	0.75	5.0	5.0	0.78
250	4.8	4.8	1.0	5.1	4.9	1.1	5.0	5.0	1.1
300	4.9	4.8	1.3	5.2	4.9	1.4	5.1	5.0	1.4
350	4.9	4.8	1.6	5.3	5.0	1.7	5.1	5.0	1.7
400	5.0	4.8	1.9	5.3	5.0	2.0	5.2	5.0	2.0
450	5.0	4.8	2.2	5.3	5.1	2.3	5.2	5.0	2.3
500	5.1	4.9	2.5	5.3	5.1	2.6	5.3	5.1	2.6
550	5.1	4.9	2.8	5.5	5.1	2.9	5.3	5.1	2.9
600	5.2	4.9	3.1	6.4	5.2	3.3	5.4	5.1	3.2
650	5.3	4.9	3.4	...	...	...	5.4	5.1	3.5
700	5.5	5.0	3.8	...	...	...	5.4	5.2	3.9
750	5.9	5.0	4.1	...	...	...	5.5	5.2	4.2
800	6.6	5.1	4.5	...	...	...	5.5	5.2	4.6

GENERAL NOTE: Coefficient A is the instantaneous coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F). Coefficient B is the mean coefficient of thermal expansion $\times 10^{-6}$ (in./in./°F) in going from 70°F to indicated temperature. Coefficient C is the linear thermal expansion (in./100 ft) in going from 70°F to indicated temperature.

(23)

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)

Temp., °F	Carbon and Low Alloy Steels		Carbon and Low Alloy Steels		Carbon and Low Alloy Steels		Carbon and Low Alloy Steels		Carbon and Low Alloy Steels	
	Material Group A [Note (1)] Plain Carbon		Material Group B [Note (2)]		Material Group C [Note (3)]		Material Group D [Note (4)]		Material Group E [Note (5)]	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	34.9	0.700	27.3	0.530	23.7	0.459	21.0	0.408	15.9	0.311
100	34.7	0.676	27.6	0.520	23.6	0.451	21.0	0.401	16.2	0.311
150	34.2	0.641	27.8	0.504	23.5	0.437	21.2	0.392	16.7	0.312
200	33.7	0.611	27.8	0.487	23.5	0.424	21.3	0.384	17.1	0.313
250	33.0	0.585	27.6	0.471	23.4	0.412	21.4	0.377	17.5	0.312
300	32.3	0.560	27.3	0.455	23.4	0.401	21.5	0.371	17.8	0.311
350	31.6	0.537	26.9	0.440	23.3	0.390	21.5	0.364	18.0	0.308
400	30.9	0.516	26.5	0.426	23.1	0.379	21.5	0.357	18.2	0.304
450	30.1	0.495	26.1	0.412	23.0	0.368	21.5	0.350	18.4	0.299
500	29.4	0.474	25.7	0.399	22.7	0.357	21.4	0.342	18.5	0.294
550	28.7	0.454	25.3	0.386	22.5	0.347	21.3	0.333	18.5	0.287
600	28.0	0.433	24.9	0.373	22.2	0.336	21.1	0.324	18.5	0.280
650	27.3	0.414	24.5	0.360	21.9	0.325	20.9	0.314	18.5	0.273
700	26.6	0.394	24.1	0.346	21.6	0.314	20.7	0.304	18.5	0.265
750	26.0	0.375	23.7	0.333	21.3	0.303	20.5	0.294	18.4	0.258
800	25.3	0.356	23.2	0.319	21.0	0.292	20.2	0.284	18.3	0.250
850	24.6	0.337	22.8	0.305	20.6	0.281	20.0	0.274	18.2	0.242
900	23.8	0.318	22.3	0.291	20.3	0.269	19.7	0.263	18.1	0.234
950	23.1	0.301	21.7	0.277	20.0	0.258	19.4	0.253	17.9	0.226
1,000	22.4	0.283	21.1	0.263	19.7	0.247	19.1	0.242	17.8	0.217
1,050	21.6	0.266	20.5	0.250	19.4	0.235	18.8	0.230	17.6	0.208
1,100	20.9	0.249	19.8	0.234	19.1	0.223	18.5	0.218	17.4	0.199
1,150	20.1	0.232	19.0	0.219	18.7	0.212	18.3	0.205	17.2	0.188
1,200	19.4	0.215	18.3	0.204	18.3	0.200	18.0	0.192	17.0	0.177
1,250	18.6	0.199	17.6	0.185	17.7	0.183	17.7	0.177	16.8	0.164
1,300	17.9	0.179	16.9	0.157	16.6	0.164	17.3	0.160	16.5	0.150
1,350	17.2	0.138	16.2	0.120	15.7	0.137	16.3	0.137	16.2	0.135
1,400	16.6	0.083	15.7	0.078	15.3	0.077	15.6	0.073	15.8	0.117
1,450	16.0	0.155	15.2	0.160	15.1	0.128	15.4	0.124	15.6	0.143
1,500	15.5	0.166	14.9	0.172	15.1	0.200	15.3	0.197	15.7	0.161
1,550	...	...	...	...	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	Carbon and Low Alloy Steels (Cont'd)		Ductile Cast Iron		High Chrome Steels		High Chrome Steels		High Alloy Steels		High Alloy Steels	
	Material Group F [Note (6)]		Material Group G [Note (7)]		Material Group H [Note (8)]		Material Group I [Note (9)]		Material Group J [Note (10)]		Material Group J [Note (10)]	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	12.8	0.256	21.7	0.439	14.2	0.276	11.6	0.221	10.0	0.188	8.6	0.151
100	13.1	0.257	22.0	0.445	14.2	0.271	11.6	0.220	10.1	0.189	8.7	0.152
150	13.6	0.258	22.5	0.455	14.3	0.265	11.7	0.217	10.3	0.189	9.0	0.154
200	14.0	0.260	22.9	0.463	14.3	0.260	11.7	0.214	10.6	0.190	9.3	0.156
250	14.4	0.261	23.2	0.430	14.4	0.256	11.8	0.211	10.9	0.190	9.6	0.158
300	14.7	0.262	23.4	0.434	14.4	0.251	11.8	0.208	11.2	0.190	9.8	0.160
350	15.0	0.262	23.5	0.436	14.4	0.246	11.9	0.205	11.5	0.190	10.1	0.162
400	15.2	0.260	23.5	0.436	14.5	0.242	11.9	0.203	11.7	0.190	10.4	0.165
450	15.4	0.258	23.5	0.436	14.5	0.237	12.0	0.200	12.0	0.190	10.6	0.167
500	15.6	0.254	23.4	0.434	14.5	0.231	12.0	0.198	12.3	0.190	10.9	0.169
550	15.8	0.250	23.3	0.399	14.6	0.226	12.1	0.195	12.5	0.190	11.1	0.172
600	15.9	0.245	23.1	0.396	14.6	0.221	12.2	0.193	12.8	0.189	11.3	0.174
650	16.0	0.239	23.0	0.394	14.6	0.216	12.2	0.190	13.0	0.188	11.6	0.177
700	16.0	0.233	...	...	14.6	0.210	12.3	0.187	13.1	0.187	11.8	0.179
750	16.1	0.227	...	...	14.6	0.205	12.3	0.183	13.3	0.184	12.0	0.182
800	16.1	0.220	...	...	14.7	0.200	12.4	0.179	13.4	0.181	12.3	0.184
850	16.1	0.214	...	...	14.7	0.196	12.5	0.174	13.6	0.177	12.5	0.186
900	16.1	0.207	...	...	14.7	0.191	12.6	0.169	13.7	0.171	12.7	0.189
950	16.1	0.200	...	...	14.7	0.186	12.6	0.163	13.8	0.166	12.9	0.191
1,000	16.1	0.193	...	...	14.7	0.180	12.7	0.158	13.9	0.159	13.1	0.194
1,050	16.0	0.185	...	...	14.7	0.174	12.8	0.153	14.0	0.152	13.4	0.196
1,100	16.0	0.176	...	...	14.7	0.167	12.9	0.148	14.0	0.144	13.6	0.198
1,150	15.9	0.166	...	...	14.8	0.159	13.0	0.152	14.1	0.136	13.8	0.201
1,200	15.8	0.155	...	...	14.8	0.149	13.1	0.159	14.3	0.130	14.0	0.203
1,250	15.7	0.142	...	...	14.8	0.137	13.2	0.168	14.4	0.138	14.3	0.205
1,300	15.6	0.127	...	...	14.8	0.123	13.4	0.176	14.5	0.153	14.5	0.208
1,350	15.4	0.111	...	...	14.8	0.107	13.5	0.183	14.7	0.171	14.7	0.210
1,400	15.3	0.147	...	...	14.8	0.158	13.7	0.189	14.9	0.185	14.9	0.212
1,450	15.1	0.165	...	...	14.8	0.172	13.8	0.194	15.2	0.194	15.1	0.214
1,500	14.9	0.177	...	...	14.9	0.173	14.0	0.199	15.5	0.200	15.3	0.216
1,550	...	...	...	...	...	...	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	High Alloy Steels (Cont'd)		High Alloy Steels		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys	
	Material Group K [Note (11)]		Material Group L [Note (12)]		Nickel N02200		Low C-Nickel N02201		Ni-Cu N04400	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	8.2	0.139	6.4	0.115	...	...	...	...	12.6	0.224
100	8.3	0.140	6.6	0.116	...	...	...	...	12.9	0.228
150	8.6	0.142	6.9	0.118	...	...	...	...	13.4	0.234
200	8.8	0.145	7.1	0.121	38.7	...	42.5	...	13.9	0.241
250	9.1	0.147	7.4	0.124	38.0	...	41.8	...	14.5	0.247
300	9.3	0.150	7.7	0.126	37.2	...	40.7	...	15.0	0.254
350	9.5	0.152	8.0	0.129	36.3	...	39.5	...	15.6	0.261
400	9.8	0.155	8.2	0.132	35.5	...	38.2	...	16.1	0.268
450	10.0	0.157	8.5	0.135	34.8	...	37.0	...	16.6	0.275
500	10.2	0.160	8.8	0.138	34.1	...	35.9	...	17.0	0.280
550	10.5	0.162	9.1	0.141	33.3	...	35.0	...	17.5	0.285
600	10.7	0.165	9.3	0.143	32.5	...	34.2	...	17.9	0.289
650	10.9	0.167	9.6	0.146	31.8	...	33.7	...	18.4	0.291
700	11.2	0.170	9.9	0.149	31.7	...	33.3	...	18.9	0.292
750	11.4	0.172	10.1	0.152	32.2	...	33.1	...	19.3	0.293
800	11.6	0.175	10.4	0.155	32.5	...	33.0	...	19.9	0.293
850	11.9	0.177	10.7	0.158	32.8	...	33.1	...	20.4	...
900	12.1	0.180	10.9	0.161	33.1	...	33.3	...	20.9	...
950	12.3	0.182	11.2	0.164	33.4	...	33.6	...	21.5	...
1,000	12.5	0.184	11.4	0.167	33.8	...	34.0	...	22.0	...
1,050	12.8	0.187	11.7	0.170	...	...	34.4	...	...	...
1,100	13.0	0.189	11.9	0.173	...	...	34.9	...	...	...
1,150	13.2	0.191	12.2	0.176	...	...	35.3	...	...	...
1,200	13.4	0.194	12.5	0.178	...	...	35.7	...	...	...
1,250	13.6	0.196	12.7	0.181	...	...	36.1	...	...	...
1,300	13.8	0.198	13.0	0.184	...	...	36.4	...	...	...
1,350	14.1	0.200	13.2	0.186	...	...	36.7	...	...	...
1,400	14.3	0.203	13.5	0.188	...	...	37.0	...	...	...
1,450	14.5	0.205	13.7	0.190	...	...	37.4	...	...	...
1,500	14.7	0.207	14.0	0.191	...	...	37.8	...	...	...
1,550	...	...	...	0.192	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	High Nickel Alloys (Cont'd)		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys	
	Ni-Cu N04405		Ni-Cr-Mo-Fe N06002		Ni-Cr-Fe- Mo-Cu N06007		N06022		N06030	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	12.6	...	5.2	0.088	5.8	0.117	5.6	...	5.9	...
100	12.9	...	5.5	0.092	6.0	0.116	5.8	...	6.1	...
150	13.4	...	5.9	0.098	6.2	0.116	6.0	...	6.5	...
200	13.9	...	6.3	0.105	6.4	0.116	6.4	...	6.9	...
250	14.5	...	6.6	0.111	6.7	0.118	6.7	...	7.3	...
300	15.0	...	7.0	0.116	6.9	0.120	7.0	...	7.6	...
350	15.6	...	7.3	0.122	7.2	0.122	7.4	...	8.0	...
400	16.1	...	7.6	0.127	7.4	0.125	7.8	...	8.4	...
450	16.6	...	7.9	0.132	7.7	0.128	8.1	...	8.7	...
500	17.0	...	8.2	0.136	7.9	0.131	8.5	...	9.1	...
550	17.5	...	8.5	0.141	8.2	0.133	8.8	...	9.5	...
600	17.9	...	8.8	0.145	8.4	0.136	9.1	...	9.8	...
650	18.4	...	9.1	0.149	8.6	0.139	9.4	...	10.2	...
700	18.9	...	9.4	0.153	8.9	0.142	9.7	...	10.5	...
750	19.3	...	9.7	0.156	9.2	0.145	10.1	...	10.8	...
800	19.9	...	10.1	0.160	9.4	0.148	10.4	...	11.1	...
850	20.4	...	10.4	0.163	9.7	0.151	10.7	...	11.4	...
900	20.9	...	10.7	0.166	9.9	0.154	11.0	...	11.6	...
950	21.5	...	11.0	0.169	10.2	0.157	11.4	...	11.9	...
1,000	22.0	...	11.4	0.172	10.5	0.160	11.7	...	12.1	...
1,050	...	...	11.7	0.174	10.7	0.163	12.0	...	12.2	...
1,100	...	...	12.0	0.176	10.9	0.166	12.3	...	12.4	...
1,150	...	...	12.3	0.178	11.1	0.168	...	...	...	...
1,200	...	...	12.6	0.180	11.2	0.171	...	...	...	...
1,250	...	...	12.9	0.182	...	...	...	...	...	...
1,300	...	...	13.2	0.183	...	...	...	...	...	...
1,350	...	...	13.5	0.183	...	...	...	...	...	...
1,400	...	...	13.8	0.184	...	...	...	...	...	...
1,450	...	...	14.2	0.183	...	...	...	...	...	...
1,500	...	...	14.6	0.182	...	...	...	...	...	...
1,550	...	...	...	0.181	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	High Nickel Alloys (Cont'd)		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys	
							Ni-Mo-Cr-Low C N06455 and N06686		Ni-Cr-Fe N06600	
	N06045		N06059		N06230					
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	7.5	0.125	6.0	0.113	5.2	0.095	5.8	0.110	8.6	0.154
100	...	...	6.3	...	5.4	0.097	5.9	0.112	8.7	0.154
150	...	...	6.6	...	5.6	0.100	6.2	0.115	8.9	0.155
200	...	...	6.9	...	5.9	0.104	6.5	0.118	9.1	0.156
250	...	...	7.2	...	6.2	0.107	6.8	0.121	9.3	0.158
300	...	...	7.4	...	6.6	0.111	7.1	0.124	9.6	0.160
350	...	...	7.7	...	6.9	0.114	7.4	0.127	9.8	0.163
400	...	...	7.9	...	7.2	0.117	7.7	0.130	10.1	0.165
450	...	...	8.2	...	7.5	0.121	8.0	0.134	10.3	0.168
500	...	...	8.5	...	7.9	0.124	8.2	0.137	10.6	0.170
550	...	...	8.7	...	8.2	0.127	8.5	0.140	10.8	0.172
600	...	...	9.0	...	8.5	0.130	8.8	0.144	11.1	0.175
650	...	...	9.3	...	8.9	0.133	9.1	0.147	11.3	0.177
700	...	...	9.5	...	9.2	0.136	9.3	0.151	11.6	0.179
750	...	...	9.8	...	9.5	0.139	9.6	0.154	11.8	0.181
800	...	...	10.1	...	9.8	0.141	9.9	0.158	12.1	0.183
850	...	...	10.3	...	10.2	0.144	10.2	0.161	12.4	0.184
900	...	...	10.6	...	10.5	0.147	10.5	0.165	12.6	0.186
950	...	...	10.8	...	10.8	0.150	10.8	0.169	12.9	0.188
1,000	...	...	11.1	...	11.1	0.152	11.1	0.173	13.2	0.189
1,050	...	...	11.4	...	11.4	0.155	11.5	0.177	13.4	0.191
1,100	...	...	11.7	...	11.7	0.158	11.8	0.181	13.7	0.192
1,150	...	...	...	...	12.0	0.160	12.1	0.185	14.0	0.194
1,200	...	...	...	...	12.3	0.163	12.5	0.189	14.3	0.196
1,250	...	...	...	...	12.7	0.165	...	...	14.6	0.197
1,300	...	...	...	...	13.0	0.166	...	...	14.9	0.199
1,350	...	...	...	...	13.3	0.168	...	...	15.2	0.201
1,400	...	...	...	...	13.6	0.168	...	...	15.5	0.204
1,450	...	...	...	...	13.9	0.168	...	...	15.8	0.206
1,500	...	...	...	...	14.2	0.167	...	...	16.0	0.208
1,550	...	...	...	...	...	...	...	...	...	0.210

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	High Nickel Alloys (Cont'd)		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys	
	Ni-Cr-Mo-Cb N06625		Ni-Cr-Fe N06690		Ni-Cr-Fe-Mo-Cb N07718		70Ni-16Cr-7Fe- Ti-Al N07750		Cr-Ni-Fe-Mo-Cu-Cb N08020	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	5.7	0.110	6.8	0.125	6.4	0.119	6.9	0.132	...	0.121
100	5.8	0.113	7.0	0.127	6.6	0.122	7.0	0.132	6.9	0.123
150	6.0	0.116	7.3	0.131	6.8	0.127	7.2	0.132	7.2	0.126
200	6.3	0.119	7.6	0.134	7.1	0.130	7.4	0.133	7.5	0.130
250	6.5	0.121	7.9	0.137	7.4	0.133	7.6	0.134	7.8	0.133
300	6.7	0.124	8.2	0.141	7.7	0.135	7.8	0.135	8.0	0.137
350	7.0	0.126	8.5	0.144	7.9	0.138	8.0	0.136	8.3	0.140
400	7.2	0.128	8.8	0.147	8.2	0.140	8.2	0.138	8.6	0.144
450	7.5	0.130	9.1	0.150	8.5	0.143	8.4	0.141	8.8	0.147
500	7.7	0.132	9.4	0.154	8.8	0.147	8.6	0.143	9.1	0.151
550	7.9	0.134	9.7	0.157	9.0	0.151	8.8	0.146	9.4	0.154
600	8.2	0.136	10.0	0.160	9.3	0.155	9.1	0.148	9.7	0.158
650	8.4	0.138	10.3	0.164	9.6	0.160	9.3	0.151	10.0	0.161
700	8.7	0.140	10.6	0.167	9.9	0.165	9.5	0.153	10.2	0.165
750	8.9	0.142	10.9	0.171	10.1	0.169	9.8	0.156	10.5	0.168
800	9.1	0.144	11.2	0.174	10.4	0.174	10.0	0.158	10.8	0.172
850	9.4	0.146	11.5	0.177	10.7	0.178	10.2	0.160	11.0	...
900	9.6	0.148	11.8	0.181	11.0	0.181	10.5	0.162	11.3	...
950	9.8	0.150	12.2	0.184	11.2	0.183	10.7	0.165	11.6	...
1,000	10.1	0.152	12.5	0.187	11.5	0.184	10.9	0.169	11.9	...
1,050	10.3	0.154	12.8	0.190	11.8	0.183	...	...	...	...
1,100	10.5	0.156	13.1	0.192	12.0	0.182	...	...	...	...
1,150	10.8	0.158	13.4	0.195	12.3	0.179	...	...	...	...
1,200	11.0	0.159	13.7	0.197	12.6	0.175	...	...	...	...
1,250	11.3	0.161	14.0	0.199	12.8	0.171	...	...	...	...
1,300	11.5	0.163	14.3	0.201	13.1	0.167	...	...	...	...
1,350	11.8	0.165	14.6	0.203	13.3	0.163	...	...	...	...
1,400	12.0	0.167	14.9	0.204	13.6	0.160	...	...	...	...
1,450	12.3	0.169	15.2	0.206	13.8	0.160	...	...	...	...
1,500	12.6	0.172	15.5	0.208	14.1	0.162	...	...	...	...
1,550	...	0.175	...	0.211	...	0.169	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	High Nickel Alloys (Cont'd)		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys	
	N08031 and N08367		Ni-Fe-Cr-Si N08330		N08354		Ni-Fe-Cr N08800, N08801, N08810, N08811		Ni-Fe-Cr-Mo-Cu N08825		Ni-Mo N10001	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	6.7	0.122	7.1	0.131	6.4	0.115	6.7	0.122	...	0.132	...	...
100	6.9	...	7.3	0.131	6.7	0.118	6.8	0.125	...	0.129	6.1	0.115
150	7.2	...	7.5	0.135	7.1	0.122	7.1	0.129	...	0.127	6.2	0.115
200	7.5	...	7.7	0.141	7.5	0.127	7.4	0.133	7.1	0.126	6.4	0.115
250	7.8	...	7.9	...	7.9	0.131	7.7	0.137	7.3	0.127	6.5	0.116
300	8.1	...	8.2	...	8.2	0.136	8.0	0.140	7.6	0.128	6.7	0.117
350	8.4	...	8.5	...	8.6	0.140	8.3	0.144	7.9	0.129	6.8	0.118
400	8.7	...	8.8	...	8.9	0.144	8.5	0.147	8.1	0.130	7.0	0.119
450	9.0	...	9.1	...	9.3	0.148	8.8	0.150	8.4	0.131	7.2	0.120
500	9.3	...	9.4	...	9.6	0.152	9.1	0.153	8.6	0.132	7.4	0.121
550	9.6	...	9.7	...	9.9	0.156	9.3	0.156	8.9	0.133	7.5	0.122
600	9.8	...	10.0	...	10.2	0.159	9.6	0.159	9.1	0.133	7.7	0.124
650	10.1	...	10.3	...	10.5	0.162	9.8	0.161	9.3	0.133	8.0	0.125
700	10.4	...	10.6	...	10.8	0.164	10.1	0.164	9.6	0.133	8.2	0.127
750	10.6	...	10.9	...	11.0	0.167	10.3	0.167	9.8	0.133	8.4	0.129
800	10.9	...	11.2	...	11.3	0.168	10.6	0.169	10.0	0.133	8.7	0.132
850	11.2	...	11.5	...	...	...	10.8	0.171	10.2	0.133	9.0	0.135
900	11.5	...	11.8	...	...	...	11.1	0.174	10.4	0.132	9.3	0.138
950	11.8	...	12.1	...	...	...	11.3	0.176	10.7	0.131	9.7	0.142
1,000	12.0	...	12.4	...	...	...	11.6	0.178	10.9	0.128	10.0	0.146
1,050	12.3	...	12.7	...	...	...	11.8	0.181	11.1	...	10.4	0.149
1,100	12.6	...	13.0	...	...	...	12.1	0.183	11.4	...	10.7	0.153
1,150	...	...	13.3	...	...	...	12.4	0.185	11.6	...	11.1	0.156
1,200	...	...	13.5	...	...	...	12.7	0.187	11.8	...	...	...
1,250	...	...	13.8	...	...	...	13.0	0.189	12.1	...	...	...
1,300	...	...	...	...	...	...	13.3	0.191	12.4	...	...	...
1,350	...	...	...	...	...	...	13.6	0.193	12.7	...	...	...
1,400	...	...	...	...	...	...	13.9	0.194	13.0	...	...	...
1,450	...	...	...	...	...	...	14.2	0.196	13.3	...	...	...
1,500	...	...	...	...	...	...	14.5	0.198	13.6	...	...	...
1,550	...	...	...	...	...	...	...	0.200	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

	High Nickel Alloys (Cont'd)		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys		High Nickel Alloys	
	Ni-Mo-Cr-Fe N10003		65Ni-25Mo- 8Cr-2Fe N10242		Ni-Mo-Cr N10276		N10629		Ni-Mo N10665	
Temp., °F	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	...	...	6.3	0.117	...	...	6.4	0.124	...	...
100	...	...	6.4	0.120	5.9	...	6.5	...	6.8	0.128
150	6.2	0.114	6.7	0.124	6.2	...	6.8	...	6.9	0.129
200	6.5	0.120	7.0	0.128	6.4	...	7.0	...	7.0	0.130
250	6.8	0.124	7.2	0.131	6.7	...	7.2	...	7.2	0.132
300	7.0	0.126	7.5	0.134	7.0	...	7.4	...	7.3	0.133
350	7.2	0.128	7.7	0.137	7.2	...	7.6	...	7.5	0.135
400	7.4	0.129	8.0	0.140	7.5	...	7.8	...	7.6	0.137
450	7.6	0.130	8.2	0.142	7.8	...	8.0	...	7.8	0.139
500	7.9	0.133	8.5	0.145	8.1	...	8.2	...	8.0	0.141
550	8.1	0.135	8.8	0.148	8.4	...	8.4	...	8.2	0.144
600	8.3	0.139	9.0	0.152	8.7	...	8.7	...	8.4	0.146
650	8.5	0.143	9.3	0.155	8.9	...	8.9	...	8.6	0.149
700	8.7	0.147	9.5	0.159	9.2	...	9.1	...	8.9	0.151
750	9.0	0.151	9.8	0.163	9.5	...	9.3	...	9.1	0.154
800	9.2	0.155	10.1	0.167	9.8	...	9.5	...	9.4	0.157
850	9.5	0.158	10.3	0.171	10.1	...	9.7	...	9.7	0.160
900	9.8	0.160	10.6	0.175	10.4	...	9.9	...	10.0	0.164
950	10.1	0.161	10.8	0.179	10.7	...	10.1	...	10.3	0.167
1,000	10.4	0.160	11.1	0.182	11.0	...	10.3	...	10.7	0.171
1,050	10.7	0.159	11.3	0.185	11.3	...	10.5	...	11.0	0.175
1,100	11.1	0.158	11.6	0.188	11.5	...	10.8	...	11.4	0.179
1,150	11.4	0.157	11.9	0.190	11.8	...	11.3	...	11.8	0.184
1,200	11.7	0.157	12.1	0.191	12.1	...	12.0	...	12.2	0.188
1,250	12.1	0.161	12.4	0.191	...	...	...	...	...	...
1,300	12.5	0.171	12.7	0.189	...	...	...	...	...	...
1,350	12.9	...	12.9	0.187	...	...	...	...	...	...
1,400	13.3	...	13.2	0.183	...	...	...	...	...	...
1,450	13.7	...	13.4	0.178	...	...	...	...	...	...
1,500	14.2	...	13.7	0.172	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

Temp., °F	High Nickel Alloys (Cont'd)		High Nickel Alloys		High Nickel Alloys		Titanium Alloys		Titanium Alloys	
	N10675		N12160		R20033		Titanium Gr. 1, 2, 2H, 3, 7, 7H, 11, 12, 16, 16H, 17, 26, 26H, and 27		Titanium Grades 9 and 28	
	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	6.5	0.115	6.3	0.115	7.7	0.130	12.7	0.359	5.1	0.145
100	6.6	0.117	6.4	0.116	7.9	...	12.5	0.352	5.2	0.147
150	6.8	0.120	6.6	0.117	8.1	...	12.2	0.341	5.5	0.150
200	6.9	0.123	6.8	0.119	8.4	...	12.0	0.330	5.7	0.152
250	7.1	0.126	7.1	0.122	8.6	...	11.9	0.321	5.9	0.155
300	7.3	0.129	7.3	0.124	8.8	...	11.7	0.313	6.1	0.158
350	7.5	0.132	7.6	0.127	9.1	...	11.6	0.306	6.2	0.160
400	7.7	0.135	7.9	0.130	9.3	...	11.5	0.300	6.4	0.163
450	8.0	0.137	8.2	0.134	9.5	...	11.4	0.294	6.6	0.166
500	8.2	0.140	8.5	0.138	9.8	...	11.3	0.290	6.7	0.168
550	8.4	0.143	8.8	0.142	10.0	...	11.2	0.286	6.8	0.170
600	8.7	0.146	9.1	0.146	10.3	...	11.2	0.283	6.9	0.172
650	8.9	0.149	9.4	0.150	10.5	...	11.2	0.280	...	...
700	9.2	0.151	9.8	0.154	10.7	...	11.2	0.278	...	...
750	9.4	0.154	10.1	0.158	11.0	...	11.2	0.276	...	...
800	9.7	0.157	10.5	0.162	11.2	...	11.2	0.275	...	...
850	9.9	0.161	10.9	0.165	11.4	...	11.2	0.274	...	...
900	10.2	0.164	11.2	0.169	11.6	...	11.3	0.273	...	...
950	10.5	0.167	11.6	0.171	...	...	11.4	0.272	...	...
1,000	10.7	0.170	12.0	0.174	...	...	11.4	0.271	...	...
1,050	11.0	0.174	12.4	0.176	...	...	11.5	0.270	...	...
1,100	11.3	0.177	12.8	0.178	...	...	11.6	0.270	...	...
1,150	11.6	0.180	13.1	0.180	...	...	...	...	...	...
1,200	11.8	0.183	13.5	0.181	...	...	...	...	...	...
1,250	12.1	0.185	13.9	0.182	...	...	...	...	...	...
1,300	12.4	0.187	14.2	0.183	...	...	...	...	...	...
1,350	12.7	0.188	14.5	0.183	...	...	...	...	...	...
1,400	13.0	0.188	14.8	0.185	...	...	...	...	...	...
1,450	13.3	0.186	15.0	0.186	...	...	...	...	...	...
1,500	13.7	0.183	15.1	0.188	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

	Titanium Alloys (Cont'd)		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys	
	Titanium Grade 38		A24430		A03560		A91060		A91100		A92014	
Temp., °F	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	4.3	0.122	94.0	2.641	92.0	2.611	135.2	3.721	133.1	3.671	89.9	2.470
100	4.4	0.124	94.5	2.638	92.9	2.608	133.7	3.647	131.8	3.606	90.9	2.480
150	4.6	0.127	96.0	2.632	94.2	2.603	131.7	3.544	130.0	3.505	92.3	2.480
200	4.8	0.130	97.3	2.629	95.4	2.597	130.1	3.457	128.5	3.418	93.6	2.480
250	5.0	0.133	98.2	2.628	96.4	2.592	128.7	3.380	127.3	3.347	94.7	2.481
300	5.2	0.137	98.9	2.622	97.4	2.590	127.5	3.311	126.2	3.285	95.7	2.479
350	5.4	0.141	99.8	2.609	98.2	2.590	126.5	3.249	125.3	3.227	96.6	2.470
400	5.6	0.144	100.4	2.600	98.9	2.580	125.6	3.190	124.5	3.170	97.4	2.470
450	5.8	0.148	...	...	...	...	...	...	...	...	...	...
500	6.0	0.152	...	...	...	...	...	...	...	...	...	...
550	6.2	0.157	...	...	...	...	...	...	...	...	...	...
600	6.4	0.161	...	...	...	...	...	...	...	...	...	...
650	6.6	0.165	...	...	...	...	...	...	...	...	...	...
700	6.9	0.171	...	...	...	...	...	...	...	...	...	...
750	7.2	0.177	...	...	...	...	...	...	...	...	...	...
800	7.5	0.184	...	...	...	...	...	...	...	...	...	...
850	...	...	...	...	...	...	...	...	...	...	...	...
900	...	...	...	...	...	...	...	...	...	...	...	...
950	...	...	...	...	...	...	...	...	...	...	...	...
1,000	...	...	...	...	...	...	...	...	...	...	...	...
1,050	...	...	...	...	...	...	...	...	...	...	...	...
1,100	...	...	...	...	...	...	...	...	...	...	...	...
1,150	...	...	...	...	...	...	...	...	...	...	...	...
1,200	...	...	...	...	...	...	...	...	...	...	...	...
1,250	...	...	...	...	...	...	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

	Aluminum Alloys (Cont'd)		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys	
	A92024		A93003		A93004		A95052 and A95652		A95083	
Temp., °F	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	85.8	2.360	102.3	2.810	94.0	2.601	79.6	2.220	67.2	1.880
100	86.9	2.370	102.8	2.800	94.9	2.598	80.8	2.229	68.7	1.909
150	88.5	2.381	103.5	2.779	96.1	2.592	82.7	2.251	70.8	1.942
200	90.0	2.388	104.2	2.762	97.2	2.589	84.4	2.269	72.8	1.968
250	91.3	2.393	104.7	2.748	98.1	2.588	85.9	2.280	74.6	1.990
300	92.4	2.398	105.2	2.731	99.0	2.582	87.2	2.290	76.2	2.011
350	93.4	2.401	105.7	2.709	99.7	2.569	88.4	2.300	77.8	2.029
400	94.4	2.390	106.1	2.690	100.4	2.560	89.6	2.300	79.2	2.050
450	...	...	...	...	...	...	...	...	...	...
500	...	...	...	...	...	...	...	...	...	...
550	...	...	...	...	...	...	...	...	...	...
600	...	...	...	...	...	...	...	...	...	...
650	...	...	...	...	...	...	...	...	...	...
700	...	...	...	...	...	...	...	...	...	...
750	...	...	...	...	...	...	...	...	...	...
800	...	...	...	...	...	...	...	...	...	...
850	...	...	...	...	...	...	...	...	...	...
900	...	...	...	...	...	...	...	...	...	...
950	...	...	...	...	...	...	...	...	...	...
1,000	...	...	...	...	...	...	...	...	...	...
1,050	...	...	...	...	...	...	...	...	...	...
1,100	...	...	...	...	...	...	...	...	...	...
1,150	...	...	...	...	...	...	...	...	...	...
1,200	...	...	...	...	...	...	...	...	...	...
1,250	...	...	...	...	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...	...

Table TCD
Nominal Coefficients of Thermal Conductivity (TC) and Thermal Diffusivity (TD)
(Cont'd)

	Aluminum Alloys (Cont'd)		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys		Aluminum Alloys	
	A95086		A95154 and A95254		A95454		A95456		A96061		A96063	
Temp., °F	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD	TC	TD
70	73.4	2.05	73.4	2.050	77.5	2.150	67.2	1.890	96.1	2.661	120.8	3.340
100	74.8	2.08	74.8	2.079	78.6	2.169	68.7	1.909	96.9	2.660	120.3	3.299
150	76.8	2.10	76.8	2.101	80.7	2.191	70.8	1.940	98.0	2.650	119.7	3.232
200	78.7	2.12	78.7	2.119	82.6	2.210	72.8	1.971	99.0	2.649	119.0	3.177
250	80.3	2.14	80.3	2.141	84.1	2.228	74.6	1.998	99.8	2.641	118.5	3.133
300	81.9	2.16	81.9	2.160	85.4	2.242	76.3	2.022	100.6	2.629	118.1	3.088
350	83.2	2.17	83.2	2.170	86.7	2.249	77.8	2.039	101.3	2.620	118.0	3.040
400	84.5	2.18	84.5	2.180	87.9	2.250	79.2	2.050	101.9	2.620	117.6	3.000
450	...	...	...	...	...	...	...	...	...	...	...	...
500	...	...	...	...	...	...	...	...	...	...	...	...
550	...	...	...	...	...	...	...	...	...	...	...	...
600	...	...	...	...	...	...	...	...	...	...	...	...
650	...	...	...	...	...	...	...	...	...	...	...	...
700	...	...	...	...	...	...	...	...	...	...	...	...
750	...	...	...	...	...	...	...	...	...	...	...	...
800	...	...	...	...	...	...	...	...	...	...	...	...
850	...	...	...	...	...	...	...	...	...	...	...	...
900	...	...	...	...	...	...	...	...	...	...	...	...
950	...	...	...	...	...	...	...	...	...	...	...	...
1,000	...	...	...	...	...	...	...	...	...	...	...	...
1,050	...	...	...	...	...	...	...	...	...	...	...	...
1,100	...	...	...	...	...	...	...	...	...	...	...	...
1,150	...	...	...	...	...	...	...	...	...	...	...	...
1,200	...	...	...	...	...	...	...	...	...	...	...	...
1,250	...	...	...	...	...	...	...	...	...	...	...	...
1,300	...	...	...	...	...	...	...	...	...	...	...	...
1,350	...	...	...	...	...	...	...	...	...	...	...	...
1,400	...	...	...	...	...	...	...	...	...	...	...	...
1,450	...	...	...	...	...	...	...	...	...	...	...	...
1,500	...	...	...	...	...	...	...	...	...	...	...	...
1,550	...	...	...	...	...	...	...	...	...	...	...	...

GENERAL NOTES:(a) TC is the thermal conductivity, Btu/hr-ft-°F, and TD is the thermal diffusivity, ft²/hr:

$$TD = \frac{TC \text{ (Btu/hr-ft-°F)}}{\text{density (lb/ft}^3\text{)} \times \text{specific heat (Btu/lb-°F)}}$$

(b) Values of thermal conductivity and thermal diffusivity should be used with the understanding that there is an associated $\pm 10\%$ uncertainty. This uncertainty results from compositional variations and variables associated with original data acquisition and analysis.**NOTES:**

(1) Material Group A includes those materials listed as "Carbon steel" in the Nominal Composition column in Tables 1A, 2A, 3, 5A, U, or Y-1.

(2) Material Group B includes those materials listed as "C-Mn-Si-Cb," "C-Mn-Si-V," "C-Mn-Si-V-Cb," "C-Mn-Ti," or "C-Si-Ti" in the Nominal Composition column in Tables 1A, 2A, 3, 5A, U, or Y-1. Also includes:

 $\frac{3}{4}\text{Cr}-\frac{1}{2}\text{Ni}-\text{Cu}$ $\frac{3}{4}\text{Ni}-\frac{1}{2}\text{Cu}-\text{Mo}$ $1\text{Cr}-\frac{1}{2}\text{Mo}-\text{Si}$ $2\frac{1}{2}\text{Ni}$

NOTES (CONT'D):

- (3) Material Group C includes the following carbon-moly steels:

C- $\frac{1}{4}$ MoC- $\frac{1}{2}$ Mo

The following low chrome steels:

 $\frac{1}{2}$ Cr- $\frac{1}{5}$ Mo-V $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-Si $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo $\frac{1}{2}$ Cr- $\frac{1}{2}$ Ni- $\frac{1}{5}$ Mo $\frac{3}{4}$ Cr- $\frac{3}{4}$ Ni-Cu-Al1Cr-1Mn- $\frac{1}{4}$ Mo1Cr- $\frac{1}{5}$ Mo1Cr- $\frac{1}{2}$ Mo1 $\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-Si1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Cu1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-Ti2Cr- $\frac{1}{2}$ Mo

The following manganese steels:

Mn- $\frac{1}{2}$ MoMn- $\frac{1}{2}$ Mo- $\frac{1}{4}$ NiMn- $\frac{1}{2}$ Mo- $\frac{1}{2}$ NiMn- $\frac{1}{2}$ Mo- $\frac{3}{4}$ NiMn- $\frac{1}{2}$ Ni-V

Mn-V

The following nickel steels:

 $\frac{1}{2}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V $\frac{1}{2}$ Ni- $\frac{1}{2}$ Mo-V $\frac{3}{4}$ Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V $\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo- $\frac{1}{3}$ Cr-V $\frac{3}{4}$ Ni- $\frac{1}{2}$ Mo-Cr-V $\frac{3}{4}$ Ni-1Mo- $\frac{3}{4}$ Cr1Ni- $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo1 $\frac{1}{4}$ Ni-1Cr- $\frac{1}{2}$ Mo3 $\frac{1}{2}$ Ni-1 $\frac{3}{4}$ Cr- $\frac{1}{2}$ Mo-V4Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V

- (4) Material Group D includes the following low chrome steels:

2 $\frac{1}{4}$ Cr-1Mo

3Cr-1Mo

3Cr-1Mo- $\frac{1}{4}$ V-Cb-Ca3Cr-1Mo- $\frac{1}{4}$ V-Ti-B

The following manganese steel:

Mn- $\frac{1}{4}$ Mo

The following nickel steels:

1 $\frac{3}{4}$ Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo2Ni- $\frac{3}{4}$ Cr- $\frac{1}{4}$ Mo2Ni- $\frac{3}{4}$ Cr- $\frac{1}{3}$ Mo2Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{4}$ Mo-V

2Ni-1Cu

2 $\frac{3}{4}$ Ni-1 $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo-V5Ni- $\frac{1}{4}$ Mo

7Ni

8Ni

9Ni

- (5) Material Group E includes:

5Cr- $\frac{1}{2}$ Mo5Cr- $\frac{1}{2}$ Mo-Si5Cr- $\frac{1}{2}$ Mo-Ti

- (6) Material Group F includes:

9Cr-1Mo

- (7) Material Group G includes:

12Cr

12Cr-1Al

13Cr

13Cr-4Ni

15Cr

17Cr

- (8) Material Group H includes:

27Cr

- (9) Material Group I includes:

17Cr-4Ni-4Cu

15Cr-5Ni-3Mo (only to 800°F)

- (10) Material Group J includes:

15Cr-6Ni-Cu-Mo (only to 800°F)

17Cr-7Ni-1Al (only to 800°F)

18Cr-8Ni

18Cr-8Ni-S (or Se)

18Cr-11Ni

22Cr-2Ni-Mo-N

23Cr-4Ni-Mo-Cu

These thermal conductivity and diffusivity values are also appropriate for H, L, N, and LN grades of austenitic stainless steels.

NOTES (CONT'D):

(11) Material Group K includes:

13Cr-8Ni-2Mo (only to 800°F)
 29Cr-7Ni-2Mo-N
 25Ni-15Cr-2Ti
 29Ni-20Cr-3Cu-2Mo
 16Cr-12Ni-2Mo
 18Cr-5Ni-3Mo
 18Cr-10Ni-Cb
 18Cr-10Ni-Ti
 18Cr-13Ni-3Mo
 18Cr-15Ni-4Si

19Cr-9Ni-Mo-W
 21Cr-11Ni-N
 22Cr-5Ni-3Mo-N
 23Cr-12Ni
 25Cr-6Ni-Mo-N
 25Cr-7Ni-4Mo-N
 25Cr-20Ni
 25Cr-20Ni-2Mo
 27Cr-7.5Ni-4.5Mo-Co-N
 44Fe-25Ni-21Cr-Mo

These thermal conductivity and diffusivity values are also appropriate for H, L, N, and LN grades of austenitic stainless steels.

(12) Material Group L includes:

14Cr-16Ni-6Si-Cu-Mo
 18Cr-18Ni-2Si
 18Cr-20Ni-5.5Si
 22Cr-13Ni-5Mn
 23Cr-25Ni-5.5Mo-N

24Cr-22Ni-6Mo-2W-Cu-N
 24Cr-22Ni-7.5Mo
 25Cr-12Ni
 25Cr-35Ni-N-Ce
 31Ni-31Fe-29Cr-Mo

These thermal conductivity and diffusivity values are also appropriate for H, L, N, and LN grades of austenitic stainless steels.