

ASME B16.48-2020
(Revision of ASME B16.48-2015)

Line Blanks

ASMENORMDOC.COM : Click to view the full PDF of ASME B16.48 2020

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers

Line Blanks

ASMENORMDOC.COM : Click to view the full PDF of ASME B16.48 2020

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: December 15, 2020

The next edition of this Standard is scheduled for publication in 2025.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME B16 Committee may be published as Cases. Cases and interpretations are published on the ASME website under the Committee Pages at <http://cstools.asme.org/> as they are issued.

Errata to codes and standards may be posted on the ASME website under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The Committee Pages can be found at <http://cstools.asme.org/>. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting "Errata" in the "Publication Information" section.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

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

Copyright © 2020 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All rights reserved
Printed in U.S.A.

CONTENTS

Foreword	v
Committee Roster	vi
Correspondence With the B16 Committee	vii
Summary of Changes	ix
List of Changes in Record Number Order	x
1 Scope	1
2 General	1
3 Pressure-Temperature Ratings	1
4 Design	2
5 Dimensions	2
6 Materials	3
7 Marking	3
8 Paddle Blank and Spacer Identification	3
9 Testing	3
Mandatory Appendix	
I References	22
Nonmandatory Appendices	
A Quality System Program	23
Figure	
2.1.1-1 Line Blanks	2
Tables	
4.3.1-1 Dimensions of Class 150 Blanks for Use With Raised Face Flanges	4
4.3.1-2 Dimensions of Class 300 Blanks for Use With Raised Face Flanges	5
4.3.1-3 Dimensions of Class 600 Blanks for Use With Raised Face Flanges	6
4.3.1-4 Dimensions of Class 900 Blanks for Use With Raised Face Flanges	7
4.3.1-5 Dimensions of Class 1500 Blanks for Use With Raised Face Flanges	8
4.3.1-6 Dimensions of Class 2500 Blanks for Use With Raised Face Flanges	9
5.1-1 Dimensions of Class 150 Female Ring-Joint Facing Figure-8 Blanks	10
5.1-2 Dimensions of Class 300 Female Ring-Joint Facing Figure-8 Blanks	11
5.1-3 Dimensions of Class 600 Female Ring-Joint Facing Figure-8 Blanks	12
5.1-4 Dimensions of Class 900 Female Ring-Joint Facing Figure-8 Blanks	13
5.1-5 Dimensions of Class 1500 Female Ring-Joint Facing Figure-8 Blanks	14
5.1-6 Dimensions of Class 2500 Female Ring-Joint Facing Figure-8 Blanks	15
5.1-7 Dimensions of Class 150 Male Ring-Joint Facing Figure-8 Blanks	16

5.1-8	Dimensions of Class 300 Male Ring-Joint Facing Figure-8 Blanks	17
5.1-9	Dimensions of Class 600 Male Ring-Joint Facing Figure-8 Blanks	18
5.1-10	Dimensions of Class 900 Male Ring-Joint Facing Figure-8 Blanks	19
5.1-11	Dimensions of Class 1500 Male Ring-Joint Facing Figure-8 Blanks	20
5.1-12	Dimensions of Class 2500 Male Ring-Joint Facing Figure-8 Blanks	21

ASMENORMDOC.COM : Click to view the full PDF of ASME B16.48 2020

FOREWORD

In July 1993, the ASME B16 Committee gave to its Subcommittee C the assignment to convert the API 590 Steel Line Blanks Standard into an ASME standard. The American Petroleum Institute no longer publishes the API 590 Standard.

These line blanks were designed in accordance with the rules of the ASME B31.3-2002 edition. Materials and relevant footnotes have been added following the ASME format.

Significant additions were made to the 2005 edition that included reference to the use of all materials listed in ASME B16.5, Table 1A plus Metric units. The added materials of construction included additions to classes of alloy steels, stainless steels, and nickel alloys. The 2005 edition was also metricated over previous editions to include both U.S. Customary units (in parentheses) and Metric units in the text, Metric units in dimensional tables in the body, and U.S. Customary units in dimensional tables in Nonmandatory Appendix A.

Following the approval of the Standards Committee and ASME, approval for the 2005 edition was granted by the American National Standards Institute (ANSI) on September 19, 2005.

The 2010 edition included revisions to paragraph numbering and adjustments of appendices. In addition to renumbering of main text, updates were made to the Materials section and Marking Method. Illustrations for the figure-8 blanks for raised face flange joints were revised. Finally, the tables for male ring-joint facing figure-8 blanks were revised to support both oval and octagonal ring shapes.

The 2015 edition included revisions to paragraph numbering, and updates to the Materials and Thickness Tolerances sections. Tables for class 300 male oval ring-joint figure-8 blanks were updated for thickness.

The B16 Committee operates under procedures accredited by ANSI. Following approval by the Standards Committee and ASME, the 2015 edition was approved as an American National Standard by ANSI on September 18, 2015, with the designation ASME B16.48-2015.

In ASME B16.48-2020, the U.S. Customary tables in former Mandatory Appendix I have been merged with the SI tables in the main text. The tables and figures have been redesignated, former Mandatory Appendix I has been deleted, and the subsequent Mandatory Appendix has been redesignated. Cross-references have been updated accordingly. In addition, this edition includes revisions to former Tables 1, 7, and 14. Following approval by the ASME B16 Standards Committee, this revision to the 2015 edition was approved as an American National Standard by ANSI on November 13, 2020, with the designation ASME B16.48-2020.

ASME B16 COMMITTEE

Standardization of Valves, Flanges, Fittings, and Gaskets

(The following is the roster of the Committee at the time of approval of this Standard.)

STANDARDS COMMITTEE OFFICERS

R. M. Bojarczuk, *Chair*
C. E. Davila, *Vice Chair*
C. Ramcharran, *Secretary*

STANDARDS COMMITTEE PERSONNEL

A. Appleton , Alloy Stainless Products Co., Inc.	R. C. Merrick , Fluor Enterprises
J. Barker , DeZURIK, Inc.	M. L. Nayyar , NICE
D. C. Bayreuther , Metso Automation, Flow Control Division	W. H. Patrick , The Dow Chemical Co.
W. B. Bedesem , Consultant	D. W. Rahoi , CCM 2000
R. Bojarczuk , ExxonMobil Research and Engineering Co.	C. Ramcharran , The American Society of Mechanical Engineers
A. M. Cheta , Qatar Shell GTL	D. Reid , VSP Technologies
M. A. Clark , Consultant	R. A. Schmidt , Canadoil
G. A. Cuccio , Capitol Manufacturing Co.	J. P. Tucker , Flowserve
J. D'Avanzo , Fluoroseal Valves	F. R. Volstadt , Volstadt and Associates, Inc.
C. E. Davila , Crane ChemPharma and Energy	F. Feng , <i>Delegate</i> , China Productivity Center for Machinery
K. S. Felder , Valero Energy	R. W. Barnes , <i>Contributing Member</i> , Anric Enterprises, Inc.
D. R. Frikken , Becht Engineering Co.	P. V. Craig , <i>Contributing Member</i> , Jomar Group
D. Hunt, Jr. , Fastenal	B. G. Fabian , <i>Contributing Member</i> , Pennsylvania Machine Works
G. A. Jolly , Samshin, Ltd.	A. G. Kireta, Jr. , <i>Contributing Member</i> , Copper Development Association, Inc.
E. J. Lain , Exelon Nuclear	
T. A. McMahon , Emerson Process Management	

SUBCOMMITTEE C — STEEL FLANGES AND FLANGED FITTINGS

A. M. Cheta , <i>Chair</i> , Qatar Shell GTL	J. R. Holstrom , Val-Matic Valve and Manufacturing Corp.
W. H. Patrick , <i>Vice Chair</i> , The Dow Chemical Co.	G. A. Jolly , Samshin, Ltd.
J. Wu , <i>Secretary</i> , The American Society of Mechanical Engineers	M. L. Nayyar , NICE
A. Appleton , Alloy Stainless Products Co., Inc.	D. W. Rahoi , CCM 2000
W. B. Bedesem , Consultant	T. V. Ramakrishnan , Forged Components, Inc.
C. E. Davila , Crane ChemPharma and Energy	R. A. Schmidt , Canadoil
B. Dennis , Kerkau Manufacturing	D. E. Tezzo , Emerson
J. P. Ellenberger , Retired	J. P. Tucker , Flowserve
D. R. Frikken , Becht Engineering Co.	G. T. Walden , Ferguson
E. Gulgun , International Standard Valve, Inc.	M. M. Zaidi , Worley
G. B. Hailegiorgis , AFGlobal	

CORRESPONDENCE WITH THE B16 COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B16 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
<http://go.asme.org/Inquiry>

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. 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 documentation.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B16 Standards Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B16 Standards Committee.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at <http://go.asme.org/InterpretationRequest>. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may e-mail the request to the Secretary of the B16 Standards Committee at SecretaryB16@asme.org, or mail it to the above address. The request for an interpretation should be clear and unambiguous. It is further recommended that the Inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry in one or two words.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of "Yes" or "No," with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

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.

Attending Committee Meetings. The B16 Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the B16 Standards Committee.

ASMENORMDOC.COM : Click to view the full PDF of ASME B16.48 2020

ASME B16.48-2020

SUMMARY OF CHANGES

Following approval by the ASME B16 Standards Committee and ASME, and after public review, ASME B16.48-2020 was approved by the American National Standards Institute on November 13, 2020.

In ASME B16.48-2020, the U.S. Customary tables in former Mandatory Appendix I have been merged with the SI tables in the main text. The tables and figures have been redesignated, former Mandatory Appendix I has been deleted, and subsequent Mandatory Appendix has been redesignated. Cross-references have been updated accordingly. In addition, this edition includes the following changes identified by a margin note, **(20)**. The Record Numbers listed below are explained in more detail in the “List of Changes in Record Number Order” following this Summary of Changes.

<i>Page</i>	<i>Location</i>	<i>Change (Record Number)</i>
4	Table 4.3.1-1	Formerly Table 1; outside diameter revised for NPS 2½ and NPS 4 (17-3164, 18-2075)
10	Table 5.1-1	Formerly Table 7; outside diameter revised for NPS 4 and NPS 14 (18-807)
17	Table 5.1-8	Formerly Table 14; centerline dimension revised for NPS 14 (18-109)

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
17-3164	Revised NPS 2½ for “Outside Diameter, <i>O</i> ” in Table 4.3.1-1 (former Table 1), Dimensions of Class 150 Blanks for Use With Raised Face Flanges
18-109	Revised NPS 14 for “Centerline Dimension, <i>A</i> ” in Table 5.1-8 (former Table 14), Dimensions of Class 300 Male Ring-Joint Facing Figure-8 Blanks
18-807	Revised NPS 4 and NPS 14 for “Outside Diameter, <i>O</i> ” in Table 5.1-1 (former Table 7), Dimensions of Class 150 Female Ring-Joint Facing Figure-8 Blanks
18-2075	Revised NPS 4 for “Outside Diameter, <i>O</i> ” in Table 4.3.1-1 (former Table 1), Dimensions of Class 150 Blanks for Use With Raised Face Flanges

ASMENORMDOC.COM : Click to view the full PDF of ASME B16.48 2020

LINE BLANKS

1 SCOPE

This Standard covers pressure-temperature ratings, materials, dimensions, tolerances, marking, and testing for operating line blanks in sizes NPS $\frac{1}{2}$ through NPS 24 for installation between ASME B16.5 flanges in the 150, 300, 600, 900, 1500, and 2500 pressure classes.

2 GENERAL

2.1 Definitions

2.1.1 Figure-8 Blank. A figure-8 blank (also called a spectacle blank) is a pressure-retaining plate with one solid end and one open end connected with a web or tie bar (see Figure 2.1.1-1).

2.1.2 Paddle Blank. A paddle blank is similar to the solid end of a figure-8 blank. It has a plain radial handle. It is generally used in conjunction with a paddle spacer in large sizes.

2.1.3 Paddle Spacer. A paddle spacer is similar to the open end of a figure-8 blank. It has a plain radial handle. It is generally used in conjunction with a paddle blank.

2.2 References

Codes, standards, and specifications, containing provisions to the extent referenced herein, constitute requirements of this Standard. These reference documents are listed in [Mandatory Appendix I](#).

2.3 Quality Systems

Nonmandatory requirements relating to the product manufacturer's Quality System Program are described in [Nonmandatory Appendix A](#).

2.4 Relevant Units

This Standard states values in both SI (Metric) and U.S. Customary units. These systems of units are to be regarded separately as standard. Within the text, the U.S. Customary units are shown in parentheses. The values stated in each system are not exact equivalents; therefore, it is required that each system of units be used independently of the other. Combining values from the two systems constitutes nonconformance with the Standard.

2.5 Convention

For determining conformance with this Standard, the convention for fixing significant digits where limits (maximum and minimum values) are specified shall be as defined in ASTM E29. This requires that an observed or calculated value be rounded off to the nearest unit in the last right-hand digit used for expressing the limit. Decimal values and tolerances do not imply a particular method of measurement.

2.6 Size

NPS, followed by a dimensionless number, is the designation for nominal blank size. NPS is related to the reference nominal diameter, DN, as defined in ISO 6708. The relationship is typically as follows:

NPS	DN
$\frac{1}{2}$	15
$\frac{3}{4}$	20
1	25
$1\frac{1}{4}$	32
$1\frac{1}{2}$	40
2	50
$2\frac{1}{2}$	65
3	80
4	100

GENERAL NOTE: For NPS ≥ 4 , the related DN = 25 multiplied by the NPS number.

2.7 Service Conditions

Criteria for selection of materials suitable for particular fluid service are not within the scope of this Standard.

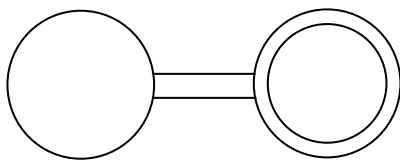
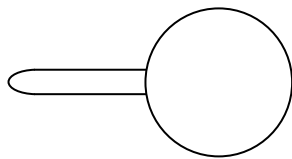
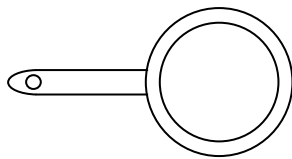
3 PRESSURE-TEMPERATURE RATINGS

3.1 Pressure Classes

Line blanks covered by this Standard are for the following pressure classes: 150, 300, 600, 900, 1500, and 2500 as listed in ASME B16.5.

3.2 Pressure-Temperature Ratings

3.2.1 Ratings. Ratings are the maximum allowable working gage pressure at the temperature shown in ASME B16.5, Tables 2 and 2C for the appropriate material

Figure 2.1.1-1 Line Blanks**(a) Figure-8 Blank****(b) Paddle Blank****(c) Paddle Spacer**

and pressure class. For intermediate temperatures, linear interpolation between temperatures within a pressure class is permitted by ASME B16.5.

3.2.2 System Pressure Testing. Line blanks may be subjected to system tests at a pressure not to exceed 1.5 times the 38°C (100°F) rating rounded off to the next higher 1 bar (25 psi) increment. Testing at any higher pressure is the responsibility of the user, taking into account the requirements of the applicable code or regulation.

3.2.3 Mixed Material Joints. Should either the two flanges or the line blank in a flanged line blank assembly not have the same pressure-temperature rating, the rating of the assembled joint at any temperature shall be the lower of the flange or line blank rating at that temperature.

4 DESIGN

4.1 Handle

The handle or web (tie bar) may be integral or attached to the line blank or spacer. The web and its attachment shall be capable of supporting the weight of the blank or spacer in all orientations without permanent deformation to the web.

4.2 Edge Preparation

In addition to machining, flame, plasma, saw cutting, and press punching are acceptable methods for forming the inside and outside diameters of line blanks. Surfaces shall be free of projections that would interfere with gasket seating.

4.3 Facing

4.3.1 Raised Face Joint Blanks. The gasket-seating surface and dimensions for line blanks used with raised face flanges shall be in accordance with ASME B16.5. A raised face may be specified for these blanks at the option of the purchaser. The height of the raised faces shall be in addition to the thicknesses, t , listed in Tables 4.3.1-1 through 4.3.1-6.

4.3.2 Female Ring-Joint Blanks. Female ring-joint grooves shall be shaped with the groove side wall surface finish not exceeding $1.6 \mu\text{m}$ (63 $\mu\text{in.}$) Ra roughness. The finish of the gasket contact faces shall be judged by visual comparison with Ra standards (see ASME B46.1) and not by instruments having stylus tracers and electronic amplification.

4.3.3 Male Ring-Joint Blanks. The gasket shape (ring) for male ring-joint blanks shall not exceed $1.6 \mu\text{m}$ (63 $\mu\text{in.}$) Ra roughness. The finish of the gasket contact faces shall be judged by visual comparison with Ra standards (see ASME B46.1) and not by instruments having stylus tracers and electronic amplification.

5 DIMENSIONS

5.1 General

Dimensions shall be in accordance with Tables 4.3.1-1 through 4.3.1-6 and 5.1-1 through 5.1-12.

5.2 Tolerances

5.2.1 Facing Tolerances. Tolerances for facings shall be in accordance with ASME B16.5.

5.2.2 Thickness Tolerances. Thickness tolerances are

Size	Tolerance, mm (in.)
NPS ≤ 18	+3.0, -0.0 (+0.12, -0.00)
NPS ≥ 20	+4.8, -0.0 (+0.19, -0.00)

5.3 Openings

(a) For NPS $\frac{1}{2}$, NPS $\frac{3}{4}$, and NPS 1 blanks in all raised face classes, the inside diameter is equal to standard weight welding neck flange bore.

(b) For NPS $1\frac{1}{4}$ and larger blanks in Classes 150 and 300 raised face, the inside diameter is equal to the pipe outside diameter.

(c) For NPS $1\frac{1}{4}$ and larger blanks in Classes 600 and 900 raised face, the inside diameter is equal to Schedule 10S welding neck flange bore.

(d) For Class 1500 raised face blanks, the inside diameter is equal to Schedule 40 welding neck flange bore.

(e) For Class 2500 raised face blanks, the inside diameter is equal to Schedule 40 through NPS 6, Schedule 60 for NPS 8 and NPS 10, and Schedule 80 for NPS 12.

(f) For all ring-joint blanks, the inside diameter is equal to the pipe outside diameter.

(g) Dimensions are based on concentric installation of spiral wound gaskets with inner rings as required by ASME B16.20 and conform to the maximum permitted bore of ASME B16.5 welding neck flanges described in ASME B16.20, Table SW-2.5-3.

5.4 Facing Finish

Facing finish shall be in accordance with ASME B16.5, para. 6.4.5.

6 MATERIALS

6.1 General

(a) Materials for line blanks shall be in accordance with ASME B16.5, Table 1A and shall include material restrictions cited in notes to ASME B16.5, Tables 2 and 2C. The blank and spacer portions of line blanks shall be manufactured as one piece in accordance with the applicable material specification. Assembly of multiple pieces into a blank or spacer portion by welding or other means is not permitted by this Standard. Attachment of the handle or web (tie bar) to a blank or spacer portion by welding or other means is permitted.

(b) Recommended bolting materials for flange-blank assemblies are listed in ASME B16.5, Table 1B.

(c) For materials manufactured to editions of the material specification other than those listed in ASME B16.5, Mandatory Appendix II, refer to para. 6.2.

(d) Criteria for the selection of materials are not within the scope of this Standard.

6.2 Materials Manufactured to Other Editions

Materials may meet the requirements of material specification editions other than those listed in ASME B16.5, Appendix II, provided

(a) the materials are the same specification, grade, type, class, alloy, and heat-treated condition, as applicable

(b) the line blank manufacturer certifies that the requirements of the edition of the specification listed in ASME B16.5, Mandatory Appendix II have been met

7 MARKING

7.1 General

(a) Line blanks shall be marked as follows:

- (1) manufacturer's name or trademark
- (2) material, specification, and grade or class
- (3) pressure class
- (4) B16
- (5) size (NPS)
- (6) ring number (if applicable)

(b) Where space does not permit all of the above markings, they may be omitted in the reverse order given in (a).

(c) The B16 designation may be applied only when the line blank has been manufactured in full conformance with this Standard.

7.2 Marking Method

The marking shall be applied by steel stamping or other marking device that leaves a legible imprint. When marking on the blind portion of the blanks, low stress marking shall be used and shall not impinge on the gasket seating surface.

8 PADDLE BLANK AND SPACER IDENTIFICATION

8.1 Paddle Handles

In order to differentiate between an installed paddle spacer and a paddle blank, it is required that there be an externally visible distinction between the two as required by paras. 8.2 and 8.3.

8.2 Paddle Blank Handles

Handles for paddle blanks shall be solid with no openings.

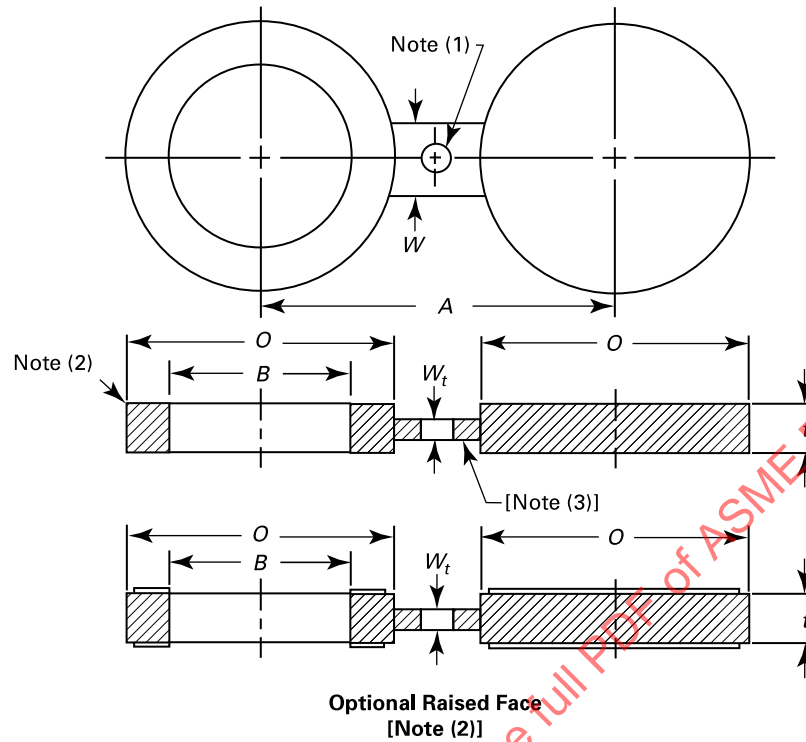
8.3 Paddle Spacer Handles

Handles for paddle spacers shall have a single through indicator hole located near the end of the handle. The hole diameter shall not be less than 12 mm ($\frac{1}{2}$ in.).

9 TESTING

Line blanks are not required to be pressure tested.

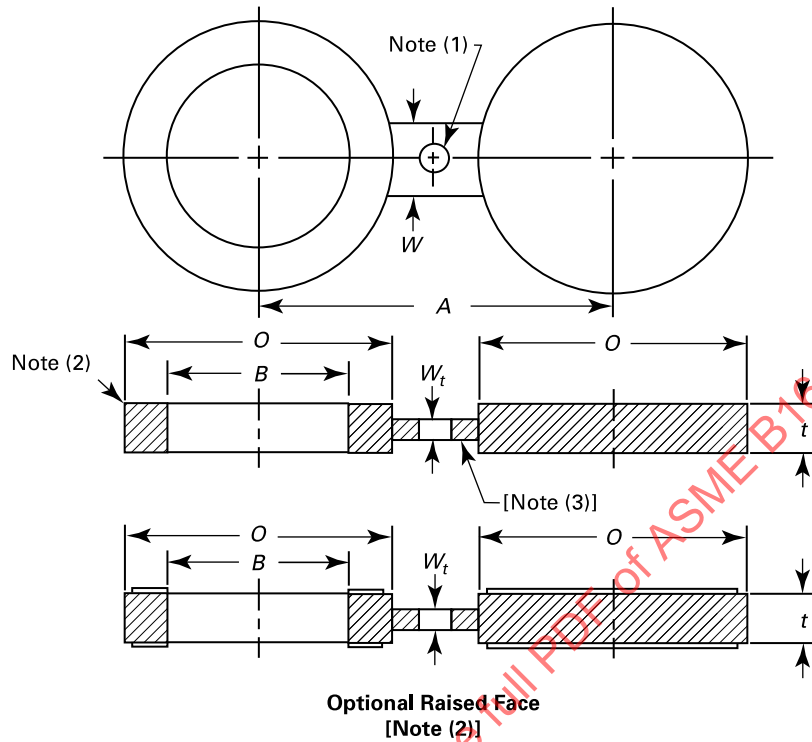
(20)

Table 4.3.1-1 Dimensions of Class 150 Blanks for Use With Raised Face Flanges

NPS	Inside Diameter, B , mm (in.)	Outside Diameter, O , mm (in.)	Centerline Dimension, A , mm (in.)	Thickness, t , mm (in.)	Web Width, W , mm (in.)
$\frac{1}{2}$	16 (0.62)	45 (1.75)	60 (2.38)	3.0 (0.12)	38 (1.50)
$\frac{3}{4}$	21 (0.82)	54 (2.12)	70 (2.75)	3.0 (0.12)	38 (1.50)
1	27 (1.05)	64 (2.50)	80 (3.12)	3.0 (0.12)	38 (1.50)
$1\frac{1}{4}$	42 (1.66)	73 (2.88)	90 (3.50)	6.4 (0.25)	38 (1.50)
$1\frac{1}{2}$	48 (1.90)	83 (3.25)	100 (3.88)	6.4 (0.25)	38 (1.50)
2	61 (2.38)	102 (4.00)	120 (4.75)	6.4 (0.25)	51 (2.00)
$2\frac{1}{2}$	73 (2.88)	121 (4.75)	140 (5.50)	6.4 (0.25)	51 (2.00)
3	89 (3.50)	133 (5.25)	150 (6.00)	6.4 (0.25)	64 (2.50)
$3\frac{1}{2}$	102 (4.00)	159 (6.25)	175 (7.00)	9.7 (0.38)	64 (2.50)
4	114 (4.50)	171 (6.75)	190 (7.50)	9.7 (0.38)	64 (2.50)
5	141 (5.56)	194 (7.62)	215 (8.50)	9.7 (0.38)	76 (3.00)
6	168 (6.62)	219 (8.62)	240 (9.50)	12.7 (0.50)	76 (3.00)
8	219 (8.62)	276 (10.88)	300 (11.75)	12.7 (0.50)	76 (3.00)
10	273 (10.75)	337 (13.25)	360 (14.25)	15.7 (0.62)	102 (4.00)
12	324 (12.75)	406 (16.00)	430 (17.00)	19.1 (0.75)	102 (4.00)
14	356 (14.00)	448 (17.62)	475 (18.75)	19.1 (0.75)	108 (4.25)
16	406 (16.00)	511 (20.12)	540 (21.25)	22.4 (0.88)	108 (4.25)
18	457 (18.00)	546 (21.50)	580 (22.75)	25.4 (1.00)	114 (4.50)
20	508 (20.00)	603 (23.75)	635 (25.00)	28.4 (1.12)	121 (4.75)
24	610 (24.00)	714 (28.12)	750 (29.50)	31.8 (1.25)	140 (5.50)

NOTES:

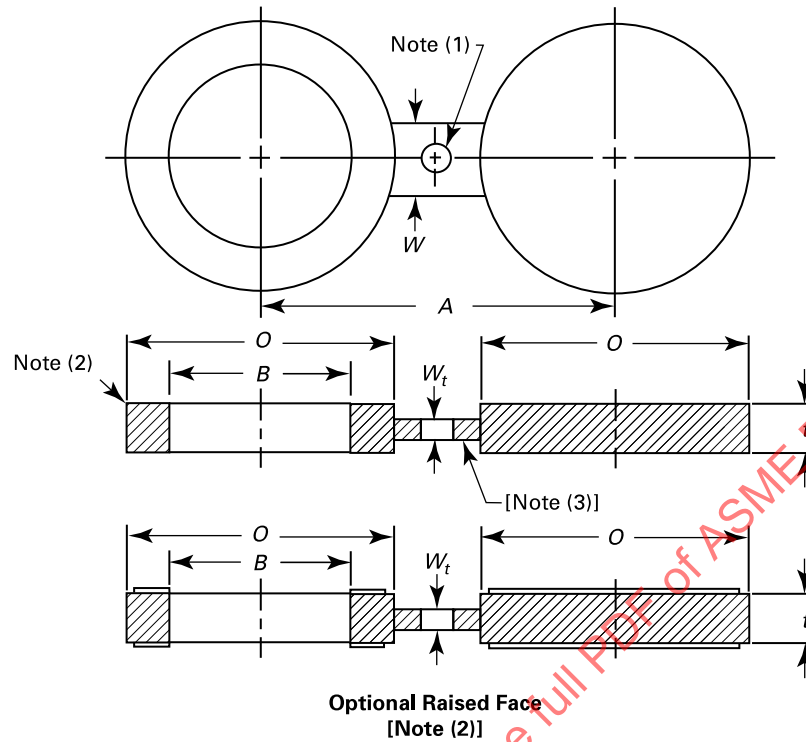
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Optional raised face. Refer to [para. 4.3.1](#).
- (3) The thickness of the web (or tie bar) dimension, W_b , shall be as determined by [para. 4.1](#).

Table 4.3.1-2 Dimensions of Class 300 Blanks for Use With Raised Face Flanges

NPS	Inside Diameter, B , mm (in.)	Outside Diameter, O , mm (in.)	Centerline Dimension, A , mm (in.)	Thickness, t , mm (in.)	Web Width, W , mm (in.)
$\frac{1}{2}$	16 (0.62)	51 (2.00)	65 (2.62)	6.4 (0.25)	38 (1.50)
$\frac{3}{4}$	21 (0.82)	64 (2.50)	80 (3.25)	6.4 (0.25)	38 (1.50)
1	27 (1.05)	70 (2.75)	90 (3.50)	6.4 (0.25)	38 (1.50)
$1\frac{1}{4}$	42 (1.66)	79 (3.12)	100 (3.88)	6.4 (0.25)	38 (1.50)
$1\frac{1}{2}$	48 (1.90)	92 (3.62)	115 (4.50)	6.4 (0.25)	38 (1.50)
2	61 (2.38)	108 (4.25)	125 (5.00)	9.7 (0.38)	51 (2.00)
$2\frac{1}{2}$	73 (2.88)	127 (5.00)	150 (5.88)	9.7 (0.38)	51 (2.00)
3	89 (3.50)	146 (5.75)	170 (6.62)	9.7 (0.38)	64 (2.50)
$3\frac{1}{2}$	102 (4.00)	162 (6.38)	185 (7.25)	12.7 (0.50)	64 (2.50)
4	114 (4.50)	178 (7.00)	200 (7.88)	12.7 (0.50)	64 (2.50)
5	141 (5.56)	213 (8.38)	235 (9.25)	15.7 (0.62)	76 (3.00)
6	168 (6.62)	248 (9.75)	270 (10.62)	15.7 (0.62)	76 (3.00)
8	219 (8.62)	305 (12.00)	330 (13.00)	22.4 (0.88)	76 (3.00)
10	273 (10.75)	359 (14.12)	385 (15.25)	25.4 (1.00)	102 (4.00)
12	324 (12.75)	419 (16.50)	450 (17.75)	28.4 (1.12)	102 (4.00)
14	356 (14.00)	483 (19.00)	515 (20.25)	31.8 (1.25)	108 (4.25)
16	406 (16.00)	536 (21.12)	570 (22.50)	38.1 (1.50)	108 (4.25)
18	457 (18.00)	594 (23.38)	630 (24.75)	41.1 (1.62)	114 (4.50)
20	508 (20.00)	651 (25.62)	685 (27.00)	44.5 (1.75)	121 (4.75)
24	610 (24.00)	772 (30.38)	810 (32.00)	50.8 (2.00)	140 (5.50)

NOTES:

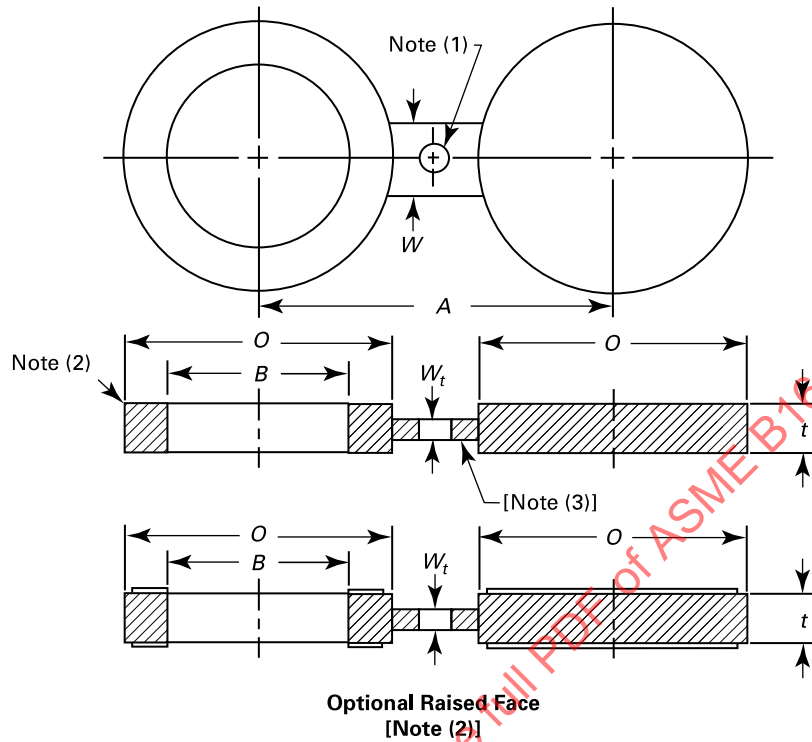
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Optional raised face. Refer to [para. 4.3.1](#).
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by [para. 4.1](#).

Table 4.3.1-3 Dimensions of Class 600 Blanks for Use With Raised Face Flanges

NPS	Inside Diameter, B , mm (in.)	Outside Diameter, O , mm (in.)	Centerline Dimension, A , mm (in.)	Thickness, t , mm (in.)	Web Width, W , mm (in.)
$\frac{1}{2}$	16 (0.62)	51 (2.00)	65 (2.62)	6.4 (0.25)	38 (1.50)
$\frac{3}{4}$	21 (0.82)	64 (2.50)	80 (3.25)	6.4 (0.25)	38 (1.50)
1	27 (1.05)	70 (2.75)	90 (3.50)	6.4 (0.25)	57 (2.25)
$1\frac{1}{4}$	37 (1.44)	79 (3.12)	100 (3.88)	9.7 (0.38)	57 (2.25)
$1\frac{1}{2}$	43 (1.68)	92 (3.62)	115 (4.50)	9.7 (0.38)	67 (2.62)
2	55 (2.16)	108 (4.25)	125 (5.00)	9.7 (0.38)	57 (2.25)
$2\frac{1}{2}$	67 (2.64)	127 (5.00)	150 (5.88)	12.7 (0.50)	67 (2.62)
3	83 (3.26)	146 (5.75)	170 (6.62)	12.7 (0.50)	67 (2.62)
$3\frac{1}{2}$	96 (3.76)	159 (6.25)	185 (7.25)	15.7 (0.62)	76 (3.00)
4	108 (4.26)	191 (7.50)	215 (8.50)	15.7 (0.62)	76 (3.00)
5	135 (5.30)	238 (9.38)	265 (10.50)	19.1 (0.75)	86 (3.38)
6	162 (6.36)	264 (10.38)	290 (11.50)	22.4 (0.88)	86 (3.38)
8	212 (8.33)	318 (12.50)	350 (13.75)	28.4 (1.12)	95 (3.75)
10	265 (10.42)	397 (15.62)	430 (17.00)	35.1 (1.38)	105 (4.12)
12	315 (12.39)	454 (17.88)	490 (19.25)	41.1 (1.62)	105 (4.12)
14	346 (13.62)	489 (19.25)	525 (20.75)	44.5 (1.75)	114 (4.50)
16	397 (15.62)	562 (22.12)	605 (23.75)	50.8 (2.00)	124 (4.88)
18	448 (17.62)	610 (24.00)	655 (25.75)	53.8 (2.12)	133 (5.25)
20	497 (19.56)	679 (26.75)	725 (28.50)	63.5 (2.50)	133 (5.25)
24	597 (23.50)	787 (31.00)	840 (33.00)	73.2 (2.88)	152 (6.00)

NOTES:

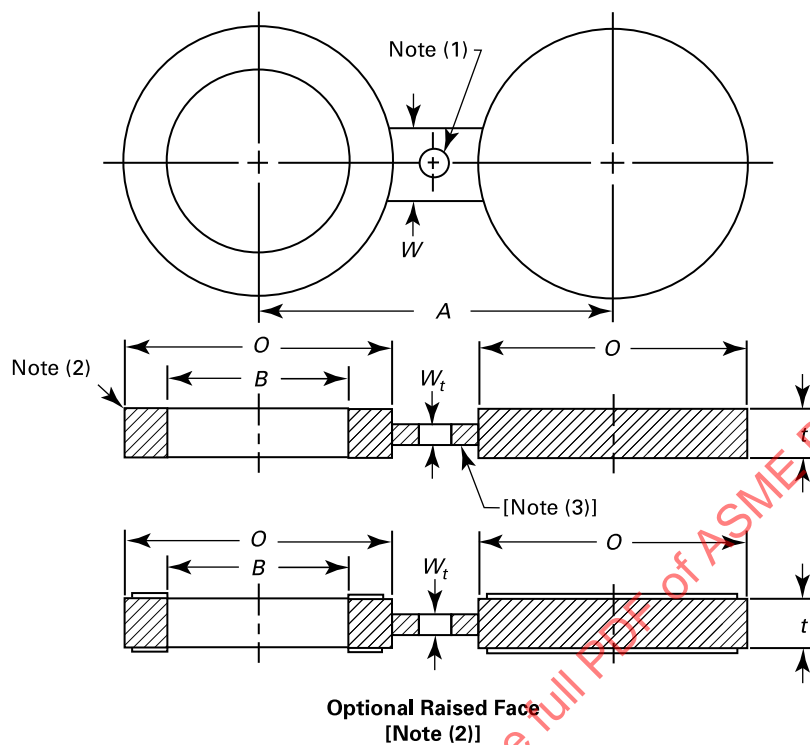
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Optional raised face. Refer to [para. 4.3.1](#).
- (3) The thickness of the web (or tie bar) dimension, W_b , shall be as determined by [para. 4.1](#).

Table 4.3.1-4 Dimensions of Class 900 Blanks for Use With Raised Face Flanges

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1/2	16 (0.62)	60 (2.38)	80 (3.25)	6.4 (0.25)	38 (1.50)
3/4	21 (0.82)	67 (2.62)	90 (3.50)	6.4 (0.25)	41 (1.62)
1	27 (1.05)	76 (3.00)	100 (4.00)	6.4 (0.25)	57 (2.25)
1 1/4	37 (1.44)	86 (3.38)	110 (4.38)	9.7 (0.38)	57 (2.25)
1 1/2	43 (1.68)	95 (3.75)	125 (4.88)	9.7 (0.38)	67 (2.62)
2	55 (2.16)	140 (5.50)	165 (6.50)	12.7 (0.50)	57 (2.25)
2 1/2	67 (2.64)	162 (6.38)	190 (7.50)	12.7 (0.50)	67 (2.62)
3	83 (3.26)	165 (6.50)	190 (7.50)	15.7 (0.62)	67 (2.62)
4	108 (4.26)	203 (8.00)	235 (9.25)	19.1 (0.75)	76 (3.00)
5	135 (5.30)	244 (9.62)	280 (11.00)	22.4 (0.88)	86 (3.38)
6	162 (6.36)	286 (11.25)	320 (12.50)	25.4 (1.00)	86 (3.38)
8	212 (8.33)	356 (14.00)	395 (15.50)	35.1 (1.38)	95 (3.75)
10	265 (10.42)	432 (17.00)	470 (18.50)	41.1 (1.62)	105 (4.12)
12	315 (12.39)	495 (19.50)	535 (21.00)	47.8 (1.88)	105 (4.12)
14	346 (13.62)	518 (20.38)	560 (22.00)	53.8 (2.12)	114 (4.50)
16	397 (15.62)	572 (22.50)	615 (24.25)	60.5 (2.38)	124 (4.88)
18	448 (17.62)	635 (25.00)	685 (27.00)	66.5 (2.62)	133 (5.25)
20	497 (19.56)	696 (27.38)	750 (29.50)	73.2 (2.88)	133 (5.25)
24	597 (23.50)	835 (32.88)	900 (35.50)	88.9 (3.50)	152 (6.00)

NOTES:

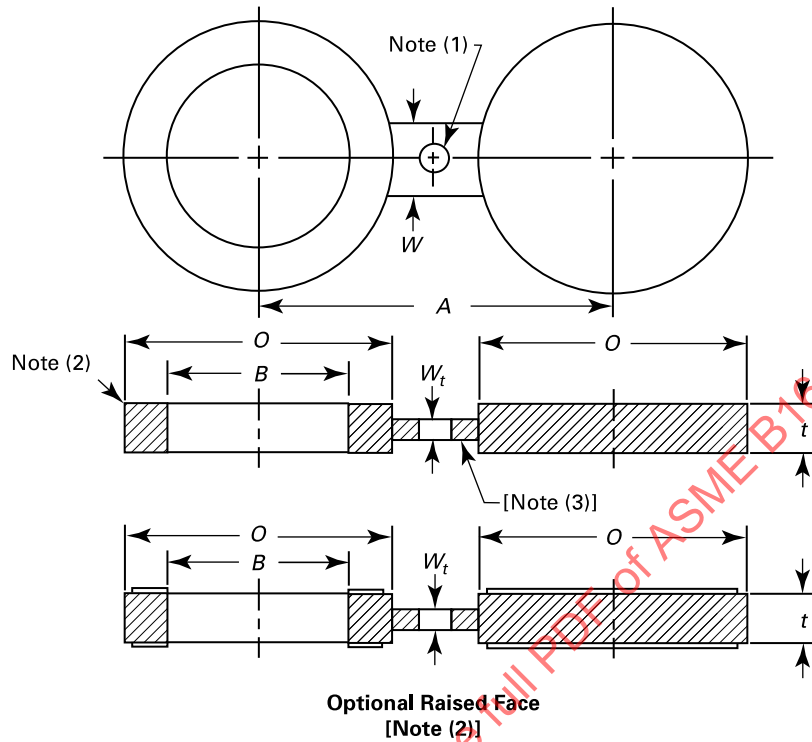
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Optional raised face. Refer to [para. 4.3.1](#).
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by [para. 4.1](#).

Table 4.3.1-5 Dimensions of Class 1500 Blanks for Use With Raised Face Flanges

NPS	Inside Diameter, B , mm (in.)	Outside Diameter, O , mm (in.)	Centerline Dimension, A , mm (in.)	Thickness, t , mm (in.)	Web Width, W , mm (in.)
$\frac{1}{2}$	16 (0.62)	61 (2.38)	80 (3.25)	6.4 (0.25)	38 (1.50)
$\frac{3}{4}$	21 (0.82)	67 (2.62)	90 (3.50)	9.7 (0.38)	41 (1.62)
1	27 (1.05)	76 (3.00)	100 (4.00)	9.7 (0.38)	64 (2.20)
$1\frac{1}{4}$	35 (1.38)	86 (3.38)	110 (4.38)	9.7 (0.38)	64 (2.50)
$1\frac{1}{2}$	41 (1.61)	95 (3.75)	125 (4.88)	12.7 (0.50)	70 (2.75)
2	53 (2.07)	140 (5.50)	165 (6.50)	12.7 (0.50)	70 (2.75)
$2\frac{1}{2}$	63 (2.47)	162 (6.38)	190 (7.50)	15.7 (0.62)	76 (3.00)
3	78 (3.07)	172 (6.75)	205 (8.00)	19.1 (0.75)	76 (3.00)
4	102 (4.03)	206 (8.12)	240 (9.50)	22.4 (0.88)	89 (3.50)
5	128 (5.05)	251 (9.88)	290 (11.50)	28.4 (1.12)	89 (3.50)
6	154 (6.06)	279 (11.00)	320 (12.50)	35.1 (1.38)	89 (3.50)
8	203 (7.98)	349 (13.75)	395 (15.50)	41.1 (1.62)	102 (4.00)
10	255 (10.02)	432 (17.00)	480 (19.00)	50.8 (2.00)	114 (4.50)
12	303 (11.94)	518 (20.38)	570 (22.50)	60.5 (2.38)	114 (4.50)
14	333 (13.12)	575 (22.62)	635 (25.00)	66.5 (2.62)	127 (5.00)
16	381 (15.00)	638 (25.12)	705 (27.75)	76.2 (3.00)	133 (5.25)
18	429 (16.88)	702 (27.62)	775 (30.50)	85.9 (3.38)	146 (5.75)
20	478 (18.81)	752 (29.62)	830 (32.75)	95.3 (3.75)	152 (6.00)
24	575 (22.62)	899 (35.38)	990 (39.00)	111.3 (4.38)	178 (7.00)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Optional raised face. Refer to [para. 4.3.1](#).
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by [para. 4.1](#).

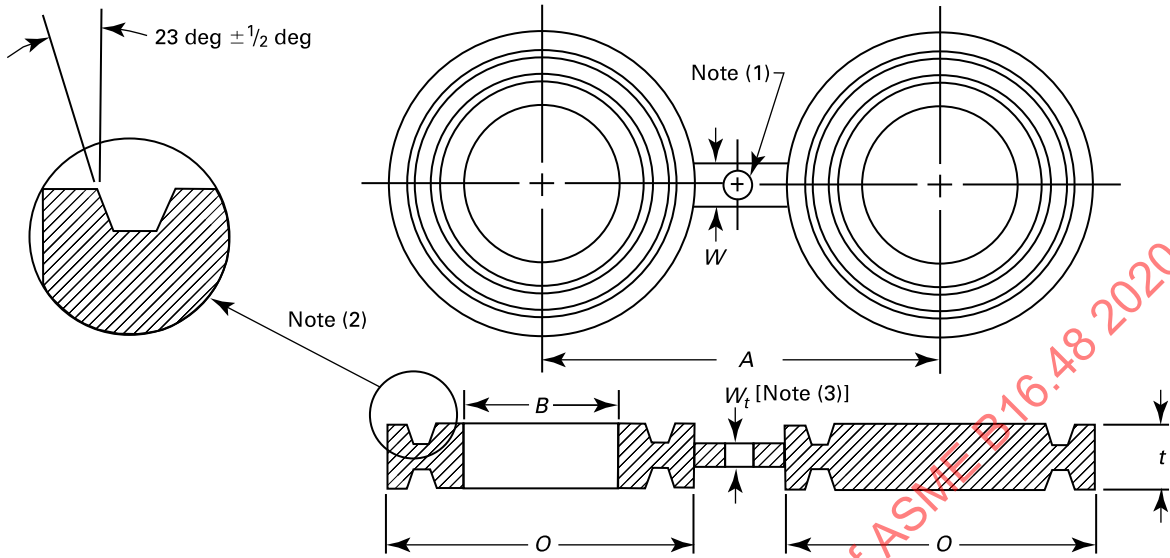
Table 4.3.1-6 Dimensions of Class 2500 Blanks for Use With Raised Face Flanges

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1/2	16 (0.62)	67 (2.62)	90 (3.50)	9.7 (0.38)	38 (1.50)
3/4	21 (0.82)	73 (2.88)	95 (3.75)	9.7 (0.38)	41 (1.62)
1	27 (1.05)	83 (3.25)	110 (4.25)	9.7 (0.38)	64 (2.50)
1 1/4	35 (1.38)	102 (4.00)	130 (5.12)	12.7 (0.50)	64 (2.50)
1 1/2	41 (1.61)	114 (4.50)	145 (5.75)	15.7 (0.62)	70 (2.75)
2	53 (2.07)	143 (5.62)	170 (6.75)	15.7 (0.62)	70 (2.75)
2 1/2	63 (2.47)	165 (6.50)	195 (7.75)	19.1 (0.75)	76 (3.00)
3	78 (3.07)	194 (7.62)	230 (9.00)	22.4 (0.88)	76 (3.00)
4	102 (4.03)	232 (9.12)	275 (10.75)	28.4 (1.12)	89 (3.50)
5	128 (5.05)	276 (10.88)	325 (12.75)	35.1 (1.38)	89 (3.50)
6	154 (6.06)	314 (12.38)	370 (14.50)	41.1 (1.62)	89 (3.50)
8	198 (7.81)	384 (15.12)	440 (17.25)	53.8 (2.12)	102 (4.00)
10	248 (9.75)	473 (18.62)	540 (21.25)	66.5 (2.62)	114 (4.50)
12	289 (11.37)	546 (21.50)	620 (24.38)	79.2 (3.12)	114 (4.50)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Optional raised face. Refer to [para. 4.3.1](#).
- (3) The thickness of the web (or tie bar) dimension, W_b , shall be as determined by [para. 4.1](#).

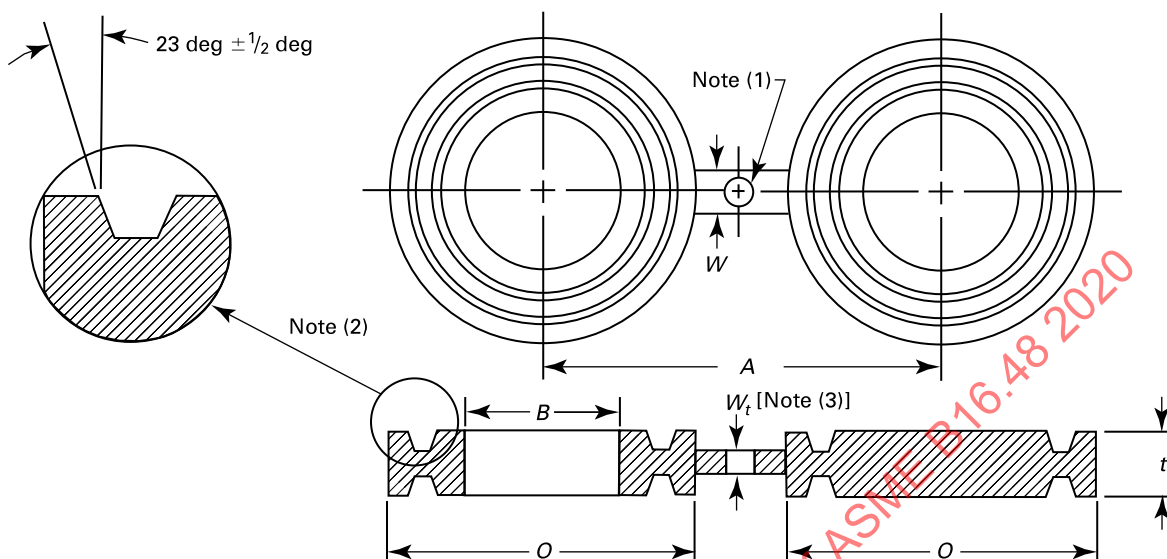
(20)

Table 5.1-1 Dimensions of Class 150 Female Ring-Joint Facing Figure-8 Blanks

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1	34 (1.32)	64 (2.50)	80 (3.12)	19.1 (0.75)	51 (2.00)
1 $\frac{1}{4}$	42 (1.66)	73 (2.88)	90 (3.50)	19.1 (0.75)	51 (2.00)
1 $\frac{1}{2}$	48 (1.90)	83 (3.25)	100 (3.88)	19.1 (0.75)	57 (2.25)
2	61 (2.38)	102 (4.00)	120 (4.75)	19.1 (0.75)	57 (2.25)
2 $\frac{1}{2}$	73 (2.88)	121 (4.75)	140 (5.50)	22.4 (0.88)	57 (2.25)
3	89 (3.50)	133 (5.25)	150 (6.00)	22.4 (0.88)	57 (2.25)
3 $\frac{1}{2}$	102 (4.00)	154 (6.06)	175 (7.00)	22.4 (0.88)	64 (2.50)
4	114 (4.50)	171 (6.75)	190 (7.50)	22.4 (0.88)	64 (2.50)
5	141 (5.56)	194 (7.62)	215 (8.50)	25.4 (1.00)	70 (2.75)
6	168 (6.62)	219 (8.62)	240 (9.50)	25.4 (1.00)	83 (3.25)
8	219 (8.62)	273 (10.75)	300 (11.75)	28.4 (1.12)	95 (3.75)
10	273 (10.75)	330 (13.00)	360 (14.25)	31.8 (1.25)	102 (4.00)
12	324 (12.75)	406 (16.00)	430 (17.00)	35.1 (1.38)	121 (4.75)
14	356 (14.00)	425 (16.75)	475 (18.75)	35.1 (1.38)	127 (5.00)
16	406 (16.00)	483 (19.00)	540 (21.25)	38.1 (1.50)	127 (5.00)
18	457 (18.00)	546 (21.50)	580 (22.75)	41.1 (1.62)	127 (5.00)
20	508 (20.00)	597 (23.50)	635 (25.00)	41.1 (1.62)	127 (5.00)
24	610 (24.00)	711 (28.00)	750 (29.50)	47.8 (1.88)	152 (6.00)

NOTES:

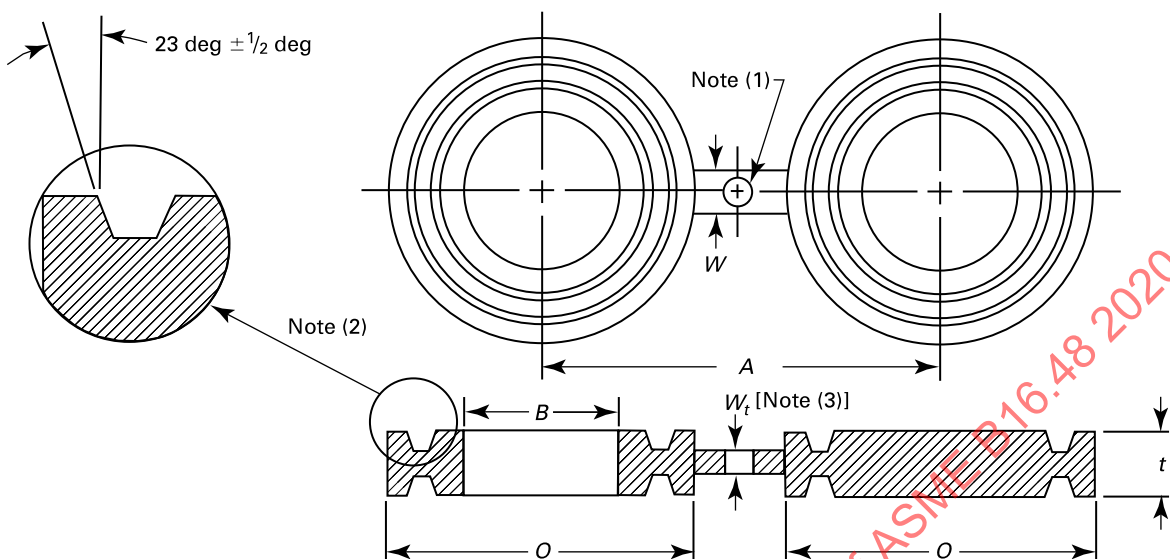
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Female ring-joint groove dimensions shall be in accordance with ASME B16.5.
- (3) The thickness of the web (or tie bar) dimension, W_b , shall be as determined by [para. 4.1](#).

Table 5.1-2 Dimensions of Class 300 Female Ring-Joint Facing Figure-8 Blanks

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
$\frac{1}{2}$	21 (0.84)	51 (2.00)	65 (2.62)	15.7 (0.62)	38 (1.50)
$\frac{3}{4}$	27 (1.05)	64 (2.50)	80 (3.25)	19.1 (0.75)	45 (1.75)
1	34 (1.32)	70 (2.75)	90 (3.50)	19.1 (0.75)	51 (2.00)
$1\frac{1}{4}$	42 (1.66)	79 (3.12)	100 (3.88)	22.4 (0.88)	51 (2.00)
$1\frac{1}{2}$	48 (1.90)	90 (3.56)	115 (4.50)	22.4 (0.88)	57 (2.25)
2	61 (2.38)	108 (4.25)	125 (5.00)	25.4 (1.00)	57 (2.25)
$2\frac{1}{2}$	73 (2.88)	127 (5.00)	150 (5.88)	28.4 (1.12)	57 (2.25)
3	89 (3.50)	146 (5.75)	170 (6.62)	28.4 (1.12)	57 (2.25)
$3\frac{1}{2}$	102 (4.00)	159 (6.25)	185 (7.25)	28.4 (1.12)	64 (2.50)
4	114 (4.50)	175 (6.88)	200 (7.88)	31.8 (1.25)	64 (2.50)
5	141 (5.56)	210 (8.25)	235 (9.25)	35.1 (1.38)	70 (2.75)
6	168 (6.62)	241 (9.50)	270 (10.62)	35.1 (1.38)	83 (3.25)
8	219 (8.62)	302 (11.88)	330 (13.00)	41.1 (1.62)	95 (3.75)
10	273 (10.75)	356 (14.00)	385 (15.25)	44.5 (1.75)	102 (4.00)
12	324 (12.75)	413 (16.25)	450 (17.75)	50.8 (2.00)	121 (4.75)
14	356 (14.00)	457 (18.00)	515 (20.25)	53.8 (2.12)	127 (5.00)
16	406 (16.00)	508 (20.00)	570 (22.50)	57.2 (2.25)	127 (5.00)
18	457 (18.00)	575 (22.62)	630 (24.75)	60.5 (2.38)	127 (5.00)
20	508 (20.00)	635 (25.00)	685 (27.00)	69.9 (2.75)	127 (5.00)
24	610 (24.00)	749 (29.50)	810 (32.00)	79.2 (3.12)	152 (6.00)

NOTES:

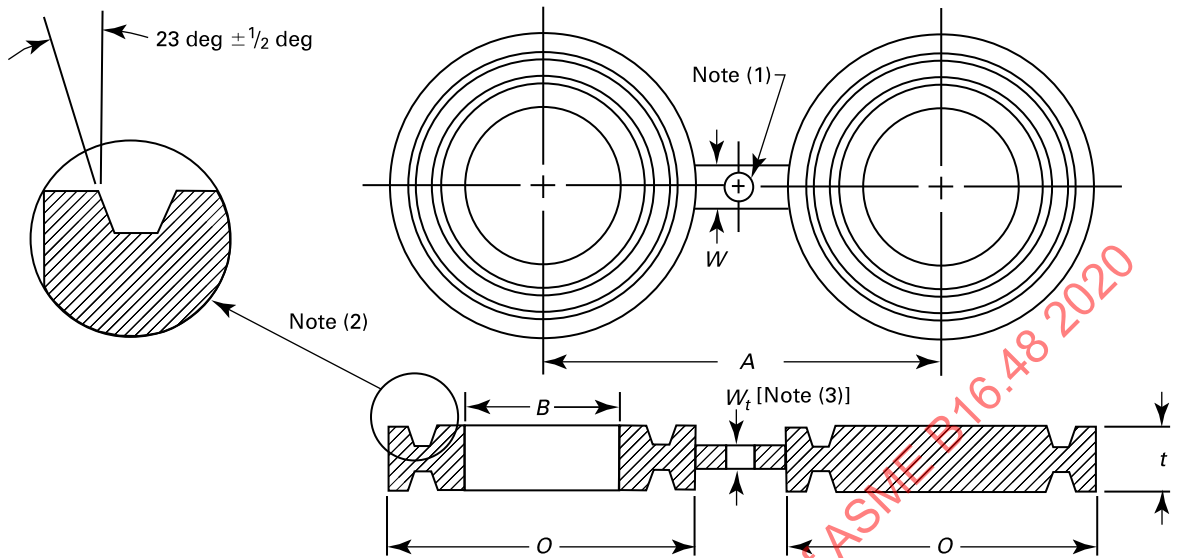
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Female ring-joint groove dimensions shall be in accordance with ASME B16.5.
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by [para. 4.1](#).

Table 5.1-3 Dimensions of Class 600 Female Ring-Joint Facing Figure-8 Blanks

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1/2	21 (0.84)	51 (2.00)	65 (2.62)	19.1 (0.75)	38 (1.50)
3/4	27 (1.05)	64 (2.50)	80 (3.25)	22.4 (0.88)	45 (1.75)
1	34 (1.32)	70 (2.75)	90 (3.50)	22.4 (0.88)	51 (2.00)
1 1/4	42 (1.66)	79 (3.12)	100 (3.88)	22.4 (0.88)	51 (2.00)
1 1/2	48 (1.90)	90 (3.56)	115 (4.50)	22.4 (0.88)	57 (2.25)
2	61 (2.38)	108 (4.25)	125 (5.00)	28.4 (1.12)	57 (2.25)
2 1/2	73 (2.88)	127 (5.00)	150 (5.88)	31.8 (1.25)	57 (2.25)
3	89 (3.50)	146 (5.75)	170 (6.62)	31.8 (1.25)	57 (2.25)
3 1/2	102 (4.00)	159 (6.25)	185 (7.25)	35.1 (1.38)	64 (2.50)
4	114 (4.50)	175 (6.88)	215 (8.50)	35.1 (1.38)	64 (2.50)
5	141 (5.56)	210 (8.25)	265 (10.50)	38.1 (1.50)	70 (2.75)
6	168 (6.62)	241 (9.50)	290 (11.50)	44.5 (1.75)	83 (3.25)
8	219 (8.62)	302 (11.88)	350 (13.75)	50.8 (2.00)	95 (3.75)
10	273 (10.75)	356 (14.00)	430 (17.00)	57.2 (2.25)	102 (4.00)
12	324 (12.75)	413 (16.25)	490 (19.25)	63.5 (2.50)	121 (4.75)
14	356 (14.00)	457 (18.00)	525 (20.75)	66.5 (2.62)	127 (5.00)
16	406 (16.00)	508 (20.00)	605 (23.75)	73.2 (2.88)	127 (5.00)
18	457 (18.00)	575 (22.62)	655 (25.75)	79.2 (3.12)	127 (5.00)
20	508 (20.00)	635 (25.00)	725 (28.50)	88.9 (3.50)	127 (5.00)
24	610 (24.00)	749 (29.50)	840 (33.00)	104.6 (4.12)	152 (6.00)

NOTES:

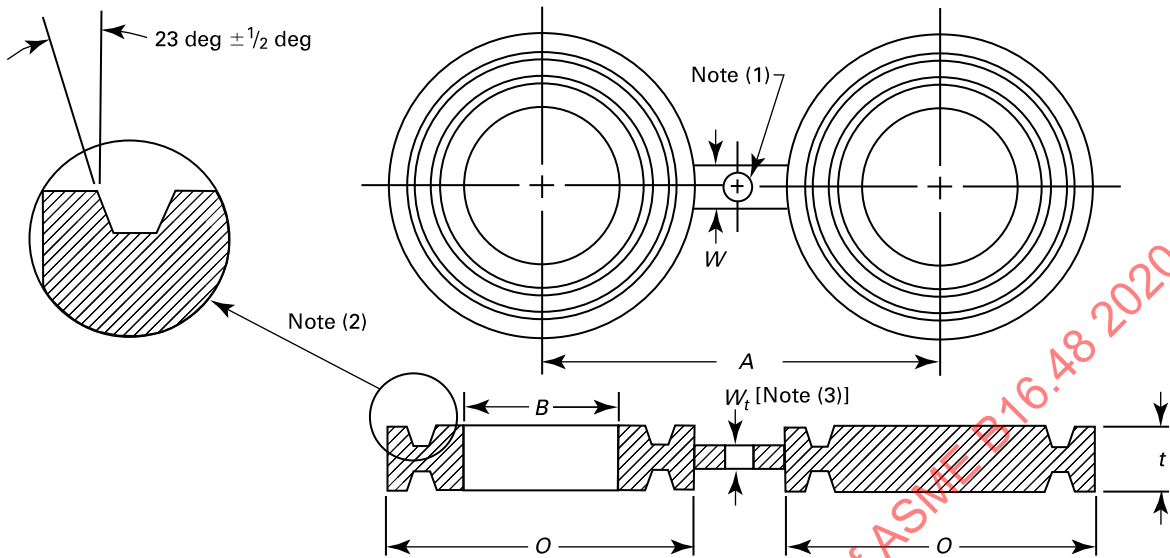
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Female ring-joint groove dimensions shall be in accordance with ASME B16.5.
- (3) The thickness of the web (or tie bar) dimension, W_b , shall be as determined by [para. 4.1](#).

Table 5.1-4 Dimensions of Class 900 Female Ring-Joint Facing Figure-8 Blanks

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1/2	21 (0.84)	61 (2.38)	80 (3.25)	22.4 (0.88)	38 (1.50)
3/4	27 (1.05)	67 (2.62)	90 (3.50)	22.4 (0.88)	45 (1.75)
1	34 (1.32)	71 (2.81)	100 (4.00)	22.4 (0.88)	51 (2.00)
1 1/4	42 (1.66)	81 (3.19)	110 (4.38)	25.4 (1.00)	51 (2.00)
1 1/2	48 (1.90)	92 (3.62)	125 (4.88)	25.4 (1.00)	64 (2.50)
2	61 (2.38)	124 (4.88)	165 (6.50)	31.8 (1.25)	51 (2.00)
2 1/2	73 (2.88)	137 (5.38)	190 (7.50)	35.1 (1.38)	67 (2.62)
3	89 (3.50)	155 (6.12)	190 (7.50)	35.1 (1.38)	67 (2.62)
4	114 (4.50)	181 (7.12)	235 (9.25)	41.1 (1.62)	73 (2.88)
5	141 (5.56)	216 (8.50)	280 (11.00)	44.5 (1.75)	73 (2.88)
6	168 (6.62)	241 (9.50)	315 (12.50)	47.8 (1.88)	73 (2.88)
8	219 (8.62)	308 (12.12)	395 (15.50)	57.2 (2.25)	80 (3.12)
10	273 (10.75)	362 (14.25)	470 (18.50)	63.5 (2.50)	121 (4.75)
12	324 (12.75)	419 (16.50)	535 (21.00)	73.2 (2.88)	121 (4.75)
14	356 (14.00)	467 (18.38)	560 (22.00)	82.6 (3.25)	121 (4.75)
16	406 (16.00)	524 (20.62)	615 (24.25)	91.9 (3.62)	127 (5.00)
18	457 (18.00)	594 (23.38)	685 (27.00)	101.6 (4.00)	133 (5.25)
20	508 (20.00)	648 (25.50)	750 (29.50)	111.3 (4.38)	127 (5.00)
24	610 (24.00)	772 (30.38)	900 (35.50)	133.4 (5.25)	140 (5.50)

NOTES:

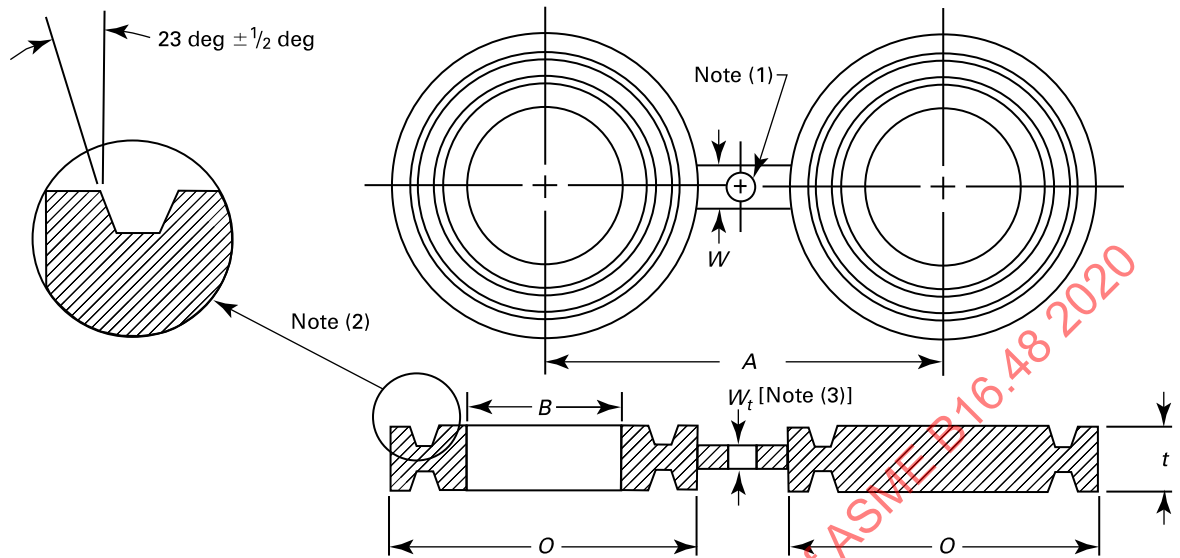
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Female ring-joint groove dimensions shall be in accordance with ASME B16.5.
- (3) The thickness of the web (or tie bar) dimension, W_b, shall be as determined by [para. 4.1](#).

Table 5.1-5 Dimensions of Class 1500 Female Ring-Joint Facing Figure-8 Blanks

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1/2	21 (0.84)	61 (2.38)	80 (3.25)	22.4 (0.88)	38 (1.50)
3/4	27 (1.05)	67 (2.62)	90 (3.50)	25.4 (1.00)	45 (1.75)
1	34 (1.32)	71 (2.81)	100 (4.00)	25.4 (1.00)	54 (2.12)
1 1/4	42 (1.66)	81 (3.19)	110 (4.38)	25.4 (1.00)	54 (2.12)
1 1/2	48 (1.90)	92 (3.62)	125 (4.88)	28.4 (1.12)	57 (2.25)
2	61 (2.38)	124 (4.88)	165 (6.50)	35.1 (1.38)	54 (2.12)
2 1/2	73 (2.88)	137 (5.38)	190 (7.50)	38.1 (1.50)	57 (2.25)
3	89 (3.50)	168 (6.62)	205 (8.00)	44.5 (1.75)	73 (2.88)
4	114 (4.50)	194 (7.62)	240 (9.50)	47.8 (1.88)	76 (3.00)
5	141 (5.56)	229 (9.00)	290 (11.50)	53.8 (2.12)	76 (3.00)
6	168 (6.62)	248 (9.75)	315 (12.50)	60.5 (2.38)	79 (3.12)
8	219 (8.62)	318 (12.50)	395 (15.50)	73.2 (2.88)	86 (3.38)
10	273 (10.75)	371 (14.62)	480 (19.00)	82.5 (3.25)	133 (5.25)
12	324 (12.75)	438 (17.25)	570 (22.50)	101.6 (4.00)	133 (5.25)
14	356 (14.00)	489 (19.25)	635 (25.00)	111.3 (4.38)	140 (5.50)
16	406 (16.00)	546 (21.50)	705 (27.75)	124.0 (4.88)	146 (5.75)
18	457 (18.00)	613 (24.12)	775 (30.50)	133.0 (5.25)	152 (6.00)
20	508 (20.00)	673 (26.50)	830 (32.75)	142.7 (5.62)	165 (6.50)
24	610 (24.00)	794 (31.25)	990 (39.00)	168.1 (6.62)	178 (7.00)

NOTES:

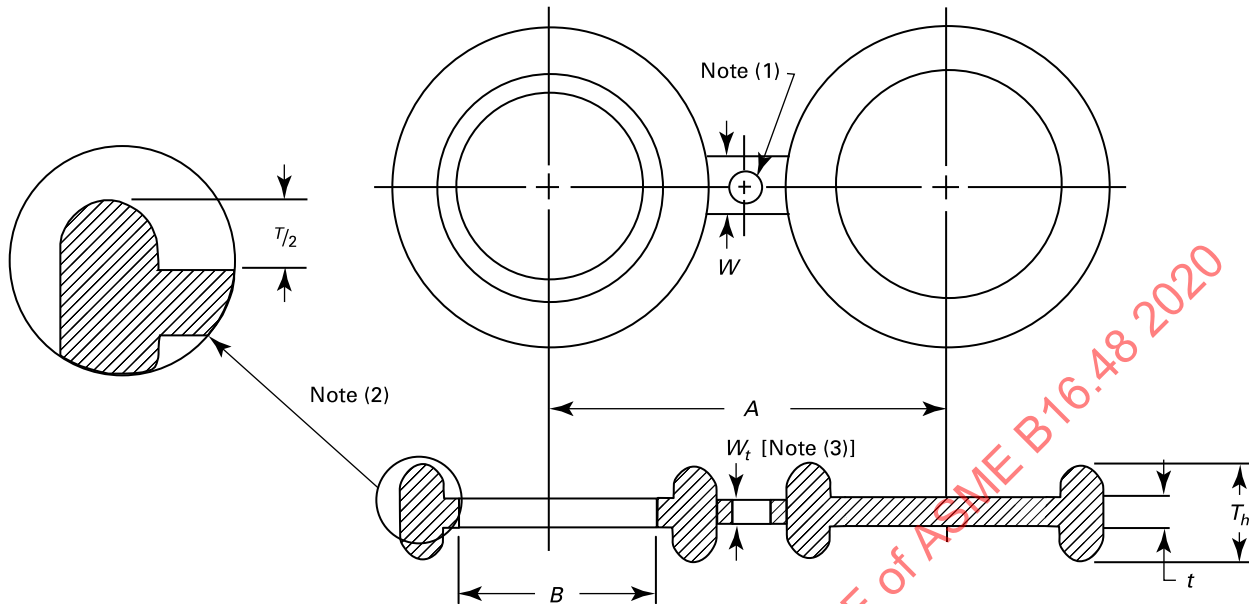
- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Female ring-joint groove dimensions shall be in accordance with ASME B16.5.
- (3) The thickness of the web (or tie bar) dimension, W_b, shall be as determined by [para. 4.1](#).

Table 5.1-6 Dimensions of Class 2500 Female Ring-Joint Facing Figure-8 Blanks

NPS	Inside Diameter, B, mm (in.)	Outside Diameter, O, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
1/2	21 (0.84)	65 (2.56)	90 (3.50)	25.4 (1.00)	38 (1.50)
3/4	27 (1.05)	73 (2.88)	95 (3.75)	28.4 (1.12)	45 (1.75)
1	34 (1.32)	83 (3.25)	110 (4.25)	28.4 (1.12)	54 (2.12)
1 1/4	42 (1.66)	102 (4.00)	130 (5.12)	35.1 (1.38)	54 (2.12)
1 1/2	48 (1.90)	114 (4.50)	145 (5.75)	38.1 (1.50)	61 (2.38)
2	61 (2.38)	133 (5.25)	170 (6.75)	41.1 (1.62)	57 (2.25)
2 1/2	73 (2.88)	149 (5.88)	195 (7.75)	47.8 (1.88)	61 (2.38)
3	89 (3.50)	168 (6.62)	230 (9.00)	50.8 (2.00)	76 (3.00)
4	114 (4.50)	203 (8.00)	270 (10.75)	63.5 (2.50)	83 (3.25)
5	141 (5.56)	241 (9.50)	325 (12.75)	73.2 (2.88)	89 (3.50)
6	168 (6.62)	279 (11.00)	370 (14.50)	82.6 (3.25)	95 (3.75)
8	219 (8.62)	340 (13.38)	440 (17.25)	98.6 (3.88)	95 (3.75)
10	273 (10.75)	425 (16.75)	540 (21.25)	117.3 (4.62)	91 (3.58)
12	324 (12.75)	495 (19.50)	620 (24.38)	133.4 (5.25)	152 (6.00)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Female ring-joint groove dimensions shall be in accordance with ASME B16.5.
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by para. 4.1.

Table 5.1-7 Dimensions of Class 150 Male Ring-Joint Facing Figure-8 Blanks

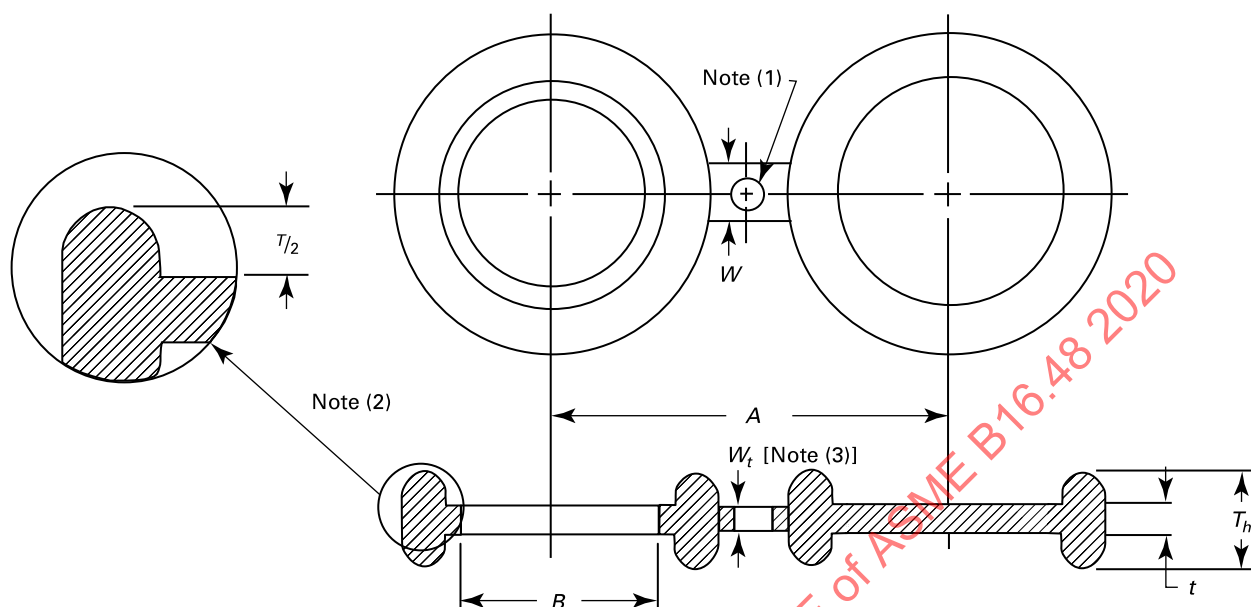
NPS	Inside Diameter, B , mm (in.)	Centerline Dimension, A , mm (in.)	Thickness, t , mm (in.)	Web Width, W , mm (in.)
1	34 (1.32)	80 (3.12)	6.4 (0.25)	51 (2.00)
1 $\frac{1}{4}$	42 (1.66)	90 (3.50)	6.4 (0.25)	51 (2.00)
1 $\frac{1}{2}$	48 (1.90)	100 (3.88)	6.4 (0.25)	57 (2.25)
2	61 (2.38)	120 (4.75)	6.4 (0.25)	57 (2.25)
2 $\frac{1}{2}$	73 (2.88)	140 (5.50)	9.7 (0.38)	57 (2.25)
3	89 (3.50)	150 (6.00)	9.7 (0.38)	57 (2.25)
3 $\frac{1}{2}$	102 (4.00)	175 (7.00)	9.7 (0.38)	64 (2.50)
4	114 (4.50)	190 (7.50)	9.7 (0.38)	64 (2.50)
5	141 (5.56)	215 (8.50)	12.7 (0.50)	76 (3.00)
6	168 (6.62)	240 (9.50)	12.7 (0.50)	83 (3.25)
8	219 (8.62)	300 (11.75)	15.7 (0.62)	95 (3.75)
10	273 (10.75)	362 (14.25)	19.1 (0.75)	102 (4.00)
12	324 (12.75)	432 (17.00)	22.4 (0.88)	121 (4.75)
14	356 (14.00)	476 (18.75)	22.4 (0.88)	127 (5.00)
16	406 (16.00)	540 (21.25)	25.4 (1.00)	127 (5.00)
18	457 (18.00)	578 (22.75)	28.4 (1.12)	127 (5.00)
20	508 (20.00)	635 (25.00)	28.4 (1.12)	127 (5.00)
24	610 (24.00)	749 (29.50)	35.1 (1.38)	152 (6.00)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Oval or octagonal ring shapes may be provided; only the oval ring is illustrated for simplicity. Ring dimensions shall be in accordance with ASME B16.20, except $T_h = T + t$, where T is the ring height specified in ASME B16.20.
- (3) The thickness of the web (or tie bar) dimension, W_b , shall be as determined by [para. 4.1](#).

Table 5.1-8 Dimensions of Class 300 Male Ring-Joint Facing Figure-8 Blanks

(20)

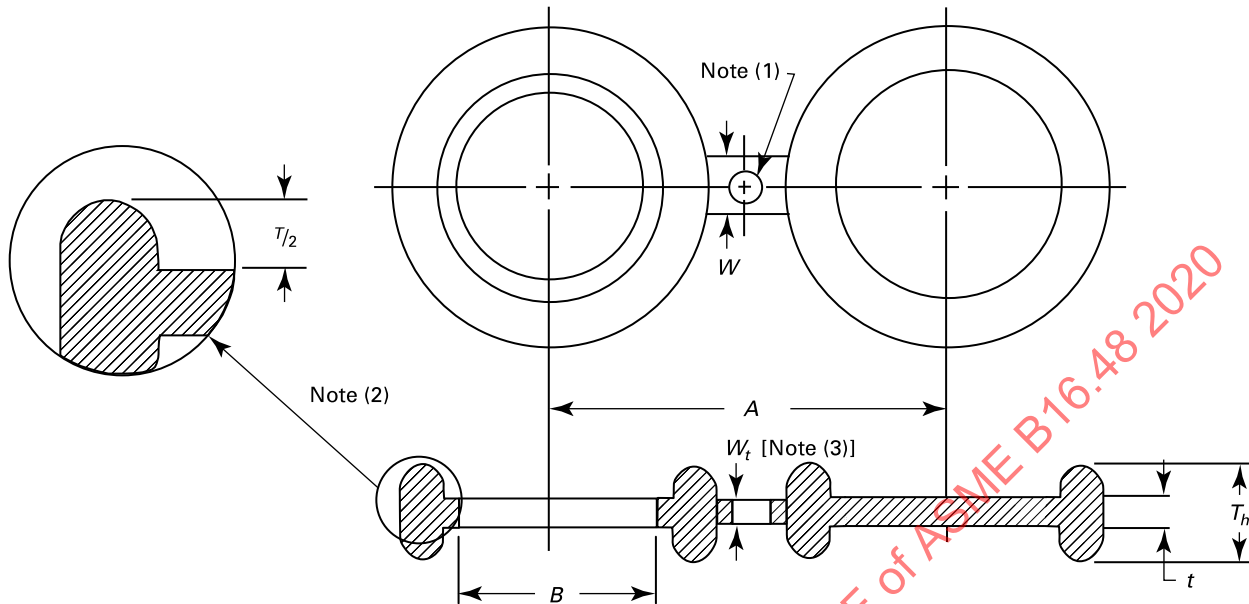


NPS	Inside Diameter, B, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
$\frac{1}{2}$	21 (0.84)	65 (2.62)	6.4 (0.25)	38 (1.50)
$\frac{3}{4}$	27 (1.05)	80 (3.25)	9.7 (0.38)	45 (1.75)
1	34 (1.32)	90 (3.50)	9.7 (0.38)	51 (2.00)
$1\frac{1}{4}$	42 (1.66)	100 (3.88)	9.7 (0.38)	51 (2.00)
$1\frac{1}{2}$	48 (1.90)	115 (4.50)	9.7 (0.38)	57 (2.25)
2	61 (2.38)	125 (5.00)	12.7 (0.50)	57 (2.25)
$2\frac{1}{2}$	73 (2.88)	150 (5.88)	15.7 (0.62)	57 (2.25)
3	89 (3.50)	170 (6.62)	15.7 (0.62)	57 (2.25)
$3\frac{1}{2}$	102 (4.00)	180 (7.25)	15.7 (0.62)	64 (2.50)
4	114 (4.50)	200 (7.88)	15.7 (0.62)	64 (2.50)
5	141 (5.56)	235 (9.25)	19.1 (0.75)	76 (3.00)
6	168 (6.62)	270 (10.62)	22.4 (0.88)	83 (3.25)
8	219 (8.62)	330 (13.00)	25.4 (1.00)	95 (3.75)
10	273 (10.75)	390 (15.25)	28.4 (1.12)	102 (4.00)
12	324 (12.75)	450 (17.75)	35.1 (1.38)	121 (4.75)
14	356 (14.00)	515 (20.25)	38.1 (1.50)	127 (5.00)
16	406 (16.00)	570 (22.50)	41.1 (1.62)	127 (5.00)
18	457 (18.00)	630 (24.75)	44.5 (1.75)	127 (5.00)
20	508 (20.00)	685 (27.00)	50.8 (2.00)	127 (5.00)
24	610 (24.00)	810 (32.00)	57.2 (2.25)	152 (6.00)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Oval or octagonal ring shapes may be provided; only the oval ring is illustrated for simplicity. Ring dimensions shall be in accordance with ASME B16.20, except $T_h = T + t$, where T is the ring height specified in ASME B16.20.
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by para. 4.1.

Table 5.1-9 Dimensions of Class 600 Male Ring-Joint Facing Figure-8 Blanks

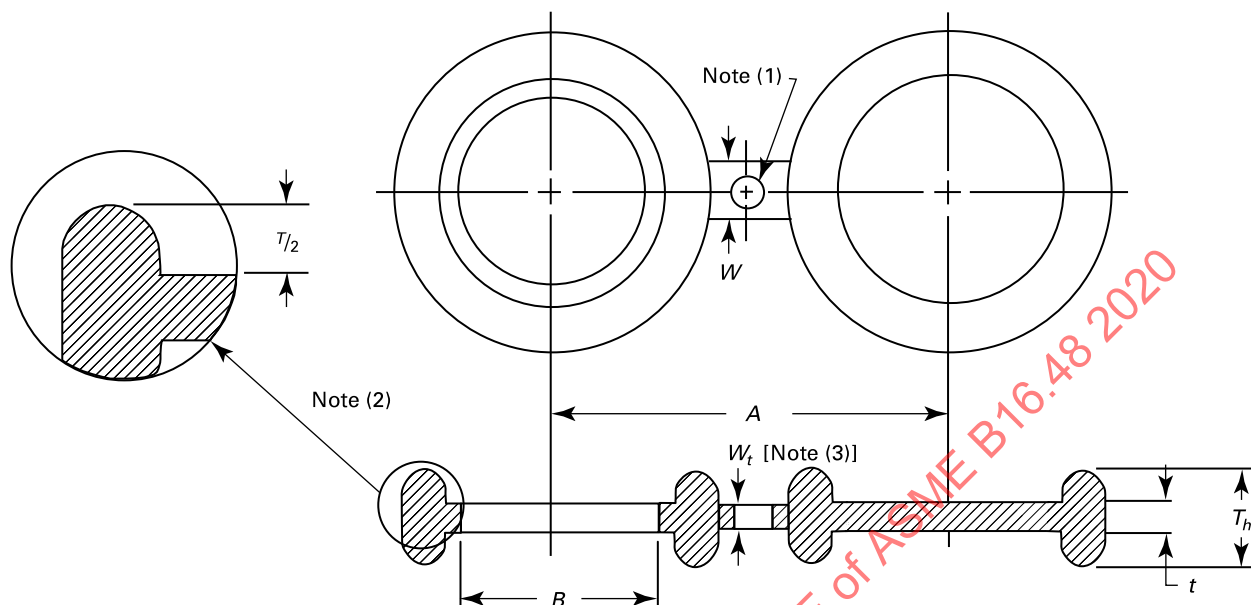


NPS	Inside Diameter, B, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
$\frac{1}{2}$	21 (0.84)	65 (2.62)	6.4 (0.25)	38 (1.50)
$\frac{3}{4}$	27 (1.05)	80 (3.25)	9.7 (0.38)	45 (1.75)
1	34 (1.32)	90 (3.50)	9.7 (0.38)	51 (2.00)
$1\frac{1}{4}$	42 (1.66)	100 (3.88)	9.7 (0.38)	57 (2.25)
$1\frac{1}{2}$	48 (1.90)	115 (4.50)	9.7 (0.38)	57 (2.25)
2	61 (2.38)	125 (5.00)	12.7 (0.50)	51 (2.00)
$2\frac{1}{2}$	73 (2.88)	150 (5.88)	15.7 (0.62)	57 (2.25)
3	89 (3.50)	170 (6.62)	15.7 (0.62)	67 (2.62)
$3\frac{1}{2}$	102 (4.00)	180 (7.25)	19.1 (0.75)	67 (2.62)
4	114 (4.50)	215 (8.50)	19.1 (0.75)	73 (2.88)
5	141 (5.56)	265 (10.50)	22.4 (0.88)	73 (2.88)
6	168 (6.62)	290 (11.50)	28.4 (1.12)	73 (2.88)
8	219 (8.62)	350 (13.75)	35.1 (1.38)	83 (3.25)
10	273 (10.75)	430 (17.00)	41.1 (1.62)	121 (4.75)
12	324 (12.75)	490 (19.25)	47.8 (1.88)	121 (4.75)
14	356 (14.00)	525 (20.75)	50.8 (2.00)	121 (4.75)
16	406 (16.00)	605 (23.75)	57.2 (2.25)	127 (5.00)
18	457 (18.00)	650 (25.75)	63.5 (2.50)	133 (5.25)
20	508 (20.00)	720 (28.50)	69.9 (2.75)	127 (5.00)
24	610 (24.00)	840 (33.00)	82.6 (3.25)	152 (6.00)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Oval or octagonal ring shapes may be provided; only the oval ring is illustrated for simplicity. Ring dimensions shall be in accordance with ASME B16.20, except $T_h = T + t$, where T is the ring height specified in ASME B16.20.
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by [para. 4.1](#).

Table 5.1-10 Dimensions of Class 900 Male Ring-Joint Facing Figure-8 Blanks



NPS	Inside Diameter, B, mm (in.)	Centerline Dimension, A, mm (in.)	Thickness, t, mm (in.)	Web Width, W, mm (in.)
$\frac{1}{2}$	21 (0.84)	80 (3.25)	9.7 (0.38)	38 (1.50)
$\frac{3}{4}$	27 (1.05)	90 (3.50)	9.7 (0.38)	45 (1.75)
1	34 (1.32)	100 (4.00)	9.7 (0.38)	51 (2.00)
$1\frac{1}{4}$	42 (1.66)	110 (4.38)	12.7 (0.50)	54 (2.12)
$1\frac{1}{2}$	48 (1.90)	125 (4.88)	12.7 (0.50)	54 (2.12)
2	61 (2.38)	165 (6.50)	15.7 (0.62)	51 (2.00)
$2\frac{1}{2}$	73 (2.88)	190 (7.50)	19.1 (0.75)	54 (2.12)
3	89 (3.50)	190 (7.50)	19.1 (0.75)	67 (2.62)
4	114 (4.50)	235 (9.25)	25.4 (1.00)	73 (2.88)
5	141 (5.56)	280 (11.00)	28.4 (1.12)	73 (2.88)
6	168 (6.62)	315 (12.50)	31.8 (1.25)	73 (2.88)
8	219 (8.62)	395 (15.50)	41.1 (1.62)	79 (3.12)
10	273 (10.75)	470 (18.50)	47.8 (1.88)	121 (4.75)
12	324 (12.75)	535 (21.00)	57.2 (2.25)	121 (4.75)
14	356 (14.00)	560 (22.00)	60.5 (2.38)	121 (4.75)
16	406 (16.00)	615 (24.25)	69.9 (2.75)	127 (5.00)
18	457 (18.00)	685 (27.00)	76.2 (3.00)	133 (5.25)
20	508 (20.00)	750 (29.50)	85.9 (3.38)	127 (5.00)
24	610 (24.00)	900 (35.50)	98.6 (3.88)	152 (6.00)

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole and located such that it will not interfere with bolting between two flanges.
- (2) Oval or octagonal ring shapes may be provided; only the oval ring is illustrated for simplicity. Ring dimensions shall be in accordance with ASME B16.20, except $T_h = T + t$, where T is the ring height specified in ASME B16.20.
- (3) The thickness of the web (or tie bar) dimension, W_t , shall be as determined by para. 4.1.