Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 7228F
Superseding AMS 7228E
Issued 3-13-40
Revised 7-16-79

RIVETS, STEEL, CORROSION RESISTANT
18Cr - 9Ni

1. SCOPE:

1.1 Type: This specification covers rivets made of a corrosion-resistant steel.

1.2 Application: Primarily for joining corrosion-resistant steel parts requiring corrosion, heat, and oxidation resistance up to approximately 800° F (425° C) but high shear strength is not required.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2248 - Chemical Check Analysis Limits, Wrought Heat and Corrosion Resistant Steels and Alloys
AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E353 - Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of
MIL-STD-1312 - Fasteners, Test Methods

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Rivets shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E353, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Carbon	--	0.12
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.045
Sulfur	--	0.030
Chromium	17.00	--
Nickel	8.00	--
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Condition: Cold headed from cold-drawn wire or bar unless purchaser permits machining. Rivets, after forming, shall be solution heat treated free from continuous carbide network, and descaled if necessary; solution heat treatment shall be performed in a furnace atmosphere which will not cause surface hardening.

3.3 Properties: Rivets shall conform to the following requirements:

3.3.1 Hardness: Shall be not higher than 150 HV10 or equivalent, determined in accordance with MIL-STD-1312, Test No. 6.

3.3.2 Formability: Solid shank rivets shall drive cold satisfactorily with a full head free from cracks and with expansion of the shank to the full diameter of the hole in which it is installed.

3.3.3 Flarability: Hollow-end rivets shall flare to a diameter of 1.5 times the nominal shank diameter without bending the shank and without cracking in the flared end.

3.4 Quality: Rivets shall be uniform in quality and condition, clean, sound, smooth, and free from foreign materials and from internal and external imperfections detrimental to their performance.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of rivets shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the rivets conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1) and hardness (3.3.1) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for formability (3.3.2) or flarability (3.3.3), as applicable, are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with the following; a lot shall be all rivets of the same part number solution heat treated in one furnace charge:

4.3.1 Acceptance Tests:

4.3.1.1 Composition: One sample from bars or wire from each heat.

4.3.1.2 Hardness: One sample, consisting of five rivets, from each lot.

4.3.2 Periodic Tests: As agreed upon by purchaser and vendor.

4.4. Reports: The vendor of rivets shall furnish with each shipment three copies of a report showing the results of tests for chemical composition and hardness of each lot in the shipment and stating that the rivets conform to the other technical requirements of this specification. This report shall include the purchase order number, this specification number and its revision letter, part number, and quantity.

4.5 Resampling and Retesting: If any rivet or specimen used in the above tests fails to meet the specified requirements, disposition of the rivets may be based on the results of testing three additional rivets or specimens for each original nonconforming specimen. Failure of any retest rivet or specimen to meet the specified requirements shall be cause for rejection of the rivets represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification and Packaging:

5.1.1 Rivets of each different part number shall be packed in separate containers.

5.1.2 Each container shall be marked to show the following information:

RIVETS, STEEL, CORROSION RESISTANT
AMS 7228F
PART NUMBER _____
PURCHASER ORDER NUMBER _____
QUANTITY _____
MANUFACTURER'S IDENTIFICATION _____

5.1.3 Containers of rivets shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the rivets to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.1.4 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.1.1 and 5.1.3 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS: Rivets not conforming to this specification or to authorized modifications will be subject to rejection.

8. NOTES:

8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.