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400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 7232G

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Superseding AMS 7232F

ALLOY RIVETS, CORROSION AND HEAT RESISTANT
74Ni - 15.5Cr - 8.0Fe

1. SCOPE:

1.1 Form: This specification covers a corrosion and heat resistant nickel alloy in the form of rivets.

1.2 Application: Primarily for fastener applications requiring corrosion resistance and heat and oxidation resistance up to 2000°F (1095°C), but with reduced strength at the higher temperatures. Rivets shall not be hand peened during driving.

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

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2269 - Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt 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 E354 - Chemical Analysis of High-Temperature, Electrical, Magnetic and Other Similar Iron, Nickel, and Cobalt Alloys

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

2.3.1 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: Shall conform to the following percentages by weight, Ø determined by wet chemical methods in accordance with ASTM E354 or by spectrochemical or other analytical methods approved by purchaser:

	min	max
Carbon	--	0.06
Manganese	--	1.00
Silicon	--	0.50
Sulfur	--	0.015
Chromium	14.00	17.00
Nickel + Cobalt	72.00	--
Iron	6.00	10.00
Cobalt (3.1.1)	--	1.00
Columbium + Tantalum (3.1.1)	--	1.00
Titanium (3.1.1)	--	0.50
Aluminum (3.1.1)	--	0.35
Copper	--	0.50

3.1.1 Determination not required for routine acceptance.

3.1.2 Check Analysis: Composition variation shall meet the requirements of AMS 2269.

3.2 Condition: Cold headed, unless purchaser permits machining, annealed, and descaled if necessary. Rivets shall be fabricated from wire cold drawn from hot finished wire or rod which has been previously ground or has had surface preparation (other than by pickling) for removal of seams and other injurious surface imperfections.

3.3 Annealing: Rivets shall be annealed by heating to 1950°F ± 25 (1065°C ± 15), holding at heat for 5 - 20 min., and cooling as required. The furnace atmosphere shall be such that it will not cause surface hardening.

3.4 Properties: Rivets shall conform to the following requirements:

3.4.1 Hardness: Shall be not higher than 151 HV, or equivalent, determined in Ø accordance with MIL-STD-1312, Test Method No. 6.

3.4.2 Formability: Solid-shank rivets shall withstand being driven cold to form a crack-free head having a diameter of 1.25 - 1.5 times the nominal shank diameter and a height within the range shown below and with expansion of the shank to the full diameter of the hole in which it is installed, provided that the hole diameter is not more than 0.006 in. (0.15 mm) greater than the nominal shank diameter.

Nominal Rivet Diameter		Head Height
Inch	Millimetres	Proportion of Nominal Diameter
0.062 - 0.094	1.55 - 2.35	0.5 - 1.0
0.125 - 0.250	3.00 - 6.25	0.5 - 0.8
0.312 - 0.375	7.80 - 9.50	0.5 - 0.7

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

3.5 Quality: Rivets, as received by purchaser, shall be uniform in quality and condition, sound, smooth, and free from foreign materials and from imperfections detrimental to usage of the rivets.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of rivets shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the rivets conform to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical Ø requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable:

4.3 Sampling: Shall be in accordance with the following; a lot shall be all rivets of the same part number annealed in a single furnace charge and presented for vendor's inspection at one time:

4.3.1 Composition: One sample from each heat.

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

4.3.3 Formability or Flarability Tests: As agreed upon by purchaser and vendor.

4.4 Reports: The vendor of rivets shall furnish with each shipment a report showing the results of tests for chemical composition and hardness and stating that the rivets conform to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 7232G, part number, and quantity.

4.5 Resampling and Retesting: If any 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 specimens for each original nonconforming specimen. Failure of any retest 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 packaged in separate containers.

5.1.2 Each container shall be marked with not less than the following information:

RIVETS, CORROSION AND HEAT RESISTANT ALLOY
AMS 7232G
PART NUMBER _____
PURCHASE 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 requirement 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 modifications authorized by purchaser 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.

8.2 Dimensions in inch/pound units and the Fahrenheit temperatures are primary; dimensions in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.