

AEROSPACE
MATERIAL
SPECIFICATION

AMS 7237A
Superseding AMS 7237

Issued 7-15-63
Revised 4-1-83

RIVETS, ALLOY, CORROSION AND HEAT RESISTANT
47.5Ni - 22Cr - 1.5Co - 9.0Mo - 0.60W - 18.5Fe
Solution Heat Treated

UNS N06002

1. SCOPE:

1.1 Type: This specification covers rivets fabricated from a corrosion and heat resistant nickel alloy.

1.2 Application: Primarily for joints requiring a combination of corrosion resistance, heat and oxidation resistance up to 2200°F (1205°C), and relatively high strength above 1500°F (815°C).

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 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-Base 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 Federal Standards:

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

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade or their use by governmental agencies is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

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: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354, 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	0.05	0.15
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	20.50	23.00
Cobalt	0.50	2.50
Molybdenum	8.00	10.00
Tungsten	0.20	1.00
Iron	17.00	20.00
Boron	--	0.010
Copper	--	0.30
Nickel	remainder	

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

3.2 Condition: Cold headed, unless purchaser permits machining, solution heat treated, 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 Heat Treatment: Rivets shall be solution heat treated by heating to $2150^{\circ}\text{F} \pm 25$ ($1175^{\circ}\text{C} \pm 15$), holding at heat for 7 - 10 min., and cooling rapidly. 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 230 HV or equivalent, determined in accordance with MIL-STD-1312, Test No. 6.

3.4.2 Formability: Rivets shall withstand being driven satisfactorily with a full head free from cracks; rivets may be heated for driving.

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 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 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:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1) and hardness (3.4.1) are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for formability (3.4.2) and flarability (3.4.3) 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 a single furnace charge and presented for vendor's inspection at one time:

4.3.1 For Acceptance Tests:

4.3.1.1 Composition: One sample from each heat of wire.

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

4.3.2 For 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 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 7237A, 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 packaged in separate containers.

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

RIVETS, CORROSION AND HEAT RESISTANT ALLOY

AMS 7237A

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 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 modifications authorized by purchaser will be subject to rejection.

8. NOTES:

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