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400 Commonwealth Dr., Warrendale, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 7235C

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Superseding AMS 7235B

RIVETS, STEEL, CORROSION AND HEAT RESISTANT
15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V
1650°F (900°C) Solution Heat Treated and Partially Precipitation Heat Treated
UNS S66286

1. SCOPE:

1.1 Form: This specification covers high quality rivets fabricated from a corrosion and heat resistant steel.

1.2 Application: Primarily for joining parts requiring joints having high strength up to 1200°F (650°C) and oxidation resistance up to 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 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 2350 - Standards and Test Methods
AMS 5731 - Steel Bars, Forgings, Tubing, and Rings, Corrosion and Heat Resistant, 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V, Consumable Electrode Melted, 1800°F (980°C) Solution Heat Treated
AMS 5734 - Steel Bars, Forgings, and Tubing, Corrosion and Heat Resistant, 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V, Consumable Electrode Melted, 1650°F (900°C) Solution Heat Treated

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

2.2.1 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 Material and Fabrication: Rivets shall be cold headed from AMS 5731 or
Ø AMS 5734 heading stock unless purchaser permits machining from AMS 5731 or AMS 5734 bar and wire.

3.2 Condition: Rivets which have been cold headed shall be solution heat treated as in 3.3.1; all rivets shall be partially precipitation heat treated as in 3.3.2.

3.3 Heat Treatment: Rivets shall be heat treated as follows; furnace atmospheres shall be such as will not cause surface hardening:

3.3.1 Solution Heat Treatment: Cold headed rivets shall be solution heat
Ø treated by heating to a temperature within the range 1650° - 1800°F (900° - 980°C), holding at the selected temperature within ± 25°F (±15°C) for not less than 15 min., and cooling as required.

3.3.2 Precipitation Heat Treatment: All rivets shall be partially precipitation
Ø heat treated by heating to a temperature within the range 1200° - 1450°F (650° - 785°C), holding at the selected temperature within ±15°F (±8°C) for not less than 30 min., and cooling in air.

3.4 Properties: Rivets shall conform to the following requirements:

3.4.1 Shear Strength: The shank shall have shear strength of 80,000 - 95,000 psi (550 - 655 MPa) as heat treated and not lower than 90,000 psi (620 MPa) after being driven, determined in accordance with MIL-STD-1312, Test 4.

3.4.2 Formability: Rivets shall withstand being driven cold to form a crack-free
Ø head having a diameter of 1.25 to 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 Proportion of Nominal Diameter
Inch	Millimetres	
0.062 - 0.094	1.55 - 2.35	0.5 - 1.0
0.125 - 0.250	3.12 - 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, when flared to an angle of 90 deg and a diameter of 1.5 times the nominal shank diameter, shall neither show evidence of bending of the shank nor show cracks in the flared end of more than 10% of the rivets flared.

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 their performance.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of rivets shall supply all Ø 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 Ø material (3.1) and shear strength (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 size and configuration made from a single heat of steel, precipitation heat treated in a single furnace load, and presented for vendor's inspection at one time:

4.3.1 For Acceptance Tests:

4.3.1.1 Material: One sample from bars, wire, or heading stock from each heat.

4.3.1.2 Shear Strength: 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 a report Ø stating that the chemical composition of the rivets conforms to the applicable material specification, showing the results of tests to determine conformance to the shear strength requirements, and stating that the parts conform to the other technical requirements of this specification. This report shall include the purchase order number, AMS 7235C, contractor or other direct supplier of material, part number, nominal size, 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 Packaging and Identification:

5.1.1 Rivets having different part numbers shall be packed in separate containers.

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

RIVETS, CORROSION AND HEAT RESISTANT STEEL
AMS 7235C
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 (Ø) symbol is used to indicate technical changes from the previous issue of this specification.

8.2 Driving: Rivets should not be hand peened during driving.

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