SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS5738 | REV. D

Issued 1956-02
Revised 2002-11
Reaffirmed 2013-04

Superseding AMS5738C

Steel, Corrosion-Resistant, Bars and Wire 18Cr - 9Ni (SAE 30303F) Free Machining, High Yield Strength Solution Heat Treated and Cold Worked

(Composition similar to UNS S30323)

RATIONALE

AMS5738D has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers a free-machining, corrosion-resistant steel in the form of cold worked bars and wire.

1.2 Application:

These products have been used typically for parts, such as bolts requiring high strength on which the amount of machining warrants use of a free-machining grade of steel, and requiring corrosion resistance similar to the 18-8 type of steel but not subjected to temperatures exceeding 700 °F (371 °C) during fabrication or in service, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2241	Tolerances, Corrosion and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
MAM 2241	Tolerances, Metric, Corrosion and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS5738D

2.1 (Continued):

AMS 2248	Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and Alloys

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM E 8	Tension Testing of Metallic Materials
ASTM E 8M	Tension Testing of Metallic Materials (Metric)
ASTM E 353	Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.12
Manganese	0.20	2.00
Silicon	--	1.00
Phosphorus	--	0.17
Sulfur	--	0.10
Chromium	17.00	19.00
Nickel	8.00	10.00
Selenium	0.15	0.35
Molybdenum	--	0.75
Copper	--	0.75

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

3.2 Condition:

Solution heat treated, free from continuous carbide network determined by metallographic examination, and cold worked.

3.3 Properties:

Product shall conform to the following requirements; tensile testing shall be performed in accordance with ASTM E 8 or ASTM E 8M.

3.3.1 Tensile Properties: Shall be as shown in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2A - Minimum Tensile Properties, Inch/Pound Units

Nominal Diameter or Least Distance Between Parallel Sides Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D %	Reduction of Area %
Up to 0.750, incl	125	100	12	35
Over 0.750 to 1.000, incl	115	80	15	35
Over 1.000 to 1.250, incl	105	65	20	35
Over 1.250 to 1.500, incl	100	50	28	45
Over 1.500 to 1.750, incl	95	45.0	28	45

TABLE 2B - Minimum Tensile Properties, SI Units

Nominal Diameter or Least Distance Between Parallel Sides	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 4D %	Reduction of Area %
Up to 19.05, incl	862	689	12	35
Over 19.05 to 25.40, incl	793	552	15	35
Over 25.40 to 31.75, incl	724	448	20	35
Over 31.75 to 38.10, incl	689	345	28	45
Over 38.10 to 44.45, incl	655	310	28	45

3.4 Quality:

Product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Bars and wire shall conform to all applicable requirements of AMS 2241 or MAM 2241.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Periodic Tests: Condition (3.2) is a periodic test and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2371.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report showing the following results of tests and relevant information:

4.4.1 For each heat:

Composition.

4.4.2 For each lot:

Tensile properties.

4.4.3 A statement that the product conforms to the other technical requirements.

4.4.4 Purchase order number
Heat and lot numbers
AMS 5738D
Size
Quantity.