



AEROSPACE MATERIAL SPECIFICATION	AMS5737™	REV. P
	Issued 1959-01 Revised 2006-06 Reaffirmed 2018-10 Superseding AMS5737N	
Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, and Tubing 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V Consumable Electrode Melted 1650 °F (899 °C) Solution and Precipitation Heat Treated (Composition similar to UNS S66286)		

RATIONALE

AMS5737P has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

This specification covers a corrosion and heat-resistant steel in the form of bars, wire, forgings, mechanical tubing, and stock for forging or heading.

1.2 Application

These products have been used typically for parts, such as turbine rotors, shafts, blades, vanes, dowels, flanges, and fittings, requiring moderate strength up to 1300 °F (704 °C) and oxidation resistance up to 1500 °F (816 °C), 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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS 2241	Tolerances, Corrosion and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
AMS 2243	Tolerances, Corrosion and Heat-Resistant Steel Tubing
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

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AMS 2374	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloy Forgings
AMS 2750	Pyrometry
AMS 2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and Alloys
AMS 2808	Identification, Forgings

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A 370	Mechanical Testing of Steel Products
ASTM E 112	Determining Average Grain Size
ASTM E 139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E 292	Conducting Time-for-Rupture Notch Tension Tests of Materials
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	--	0.08
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	13.50	16.00
Nickel	24.00	27.00
Molybdenum	1.00	1.50
Titanium	1.90	2.35
Boron	0.003	0.010
Vanadium	0.10	0.50
Cobalt	--	1.00
Aluminum	--	0.35
Copper	--	0.50

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS 2248.

3.2 Melting Practice

Steel shall be produced by multiple melting using consumable electrode practice in the remelt cycle.

3.3 Condition

The product shall be supplied in the following condition:

3.3.1 Bars, Wire, Forgings, and Mechanical Tubing

Solution and precipitation heat treated.

3.3.1.1 Bars and Wire

3.3.1.1.1 All hexagons regardless of size, and other bars 2.750 inches (69.85 mm) and under in nominal diameter or least distance between parallel sides, and wire shall be cold finished.

3.3.1.1.2 Bars, other than hexagons, over 2.750 inches (69.85 mm) in nominal diameter or least distance between parallel sides shall be hot finished and descaled or cold finished.

3.3.1.2 Forgings

Shall be descaled.

3.3.1.3 Mechanical Tubing

Shall be cold finished.

3.3.2 Stock for Forging or Heading

As ordered by the forging or heading manufacturer.

3.4 Heat Treatment

Bars, wire, forgings, and mechanical tubing shall be heat treated as follows; pyrometry shall be in accordance with AMS 2750:

3.4.1 Solution Heat Treatment

Heat to 1650 °F ± 25 (899 °C ± 14), hold at heat for a time commensurate with cross-sectional thickness, and quench in oil, water, or other medium acceptable to purchaser, except that product 0.250 inch (6.35 mm) and under in nominal diameter or least distance between parallel sides may be air cooled from the solution heat treating temperature.

3.4.2 Precipitation Heat Treatment

Heat to a temperature within the range 1300 to 1400 °F (704 to 760 °C), hold at heat for not less than 16 hours, and cool in air.

3.5 Properties

The product shall conform to the following requirements; hardness and tensile testing shall be performed in accordance with ASTM A 370:

3.5.1 Bars, Wire, Forgings, and Mechanical Tubing

3.5.1.1 Tensile Properties

Shall be as shown in Table 2, except as permitted by 3.5.1.1.1, for product 5.00 inches (127.0 mm) and under in nominal diameter or least distance between parallel sides; requirements apply in both the longitudinal and transverse direction but tests in the transverse direction need be made only on product from which a specimen not less than 2.50 inches (63.5 mm) in length can be taken. Tests in the longitudinal direction are not required on product tested in the transverse direction.

TABLE 2 - MINIMUM ROOM TEMPERATURE TENSILE PROPERTIES

Property	Value
Tensile Strength	140 ksi (965 MPa)
Yield Strength at 0.2% Offset	95 ksi (655 MPa)
Elongation in 4D	12%
Reduction of Area	15%