



AEROSPACE MATERIAL SPECIFICATION

AMS5731™

REV. L

Issued	1963-01
Revised	2006-06
Reaffirmed	2018-10

Superseding AMS5731K

Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, Tubing, and Rings
 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V
 Consumable Electrode Melted, 1800 °F (982 °C) Solution Heat Treated
 (Composition similar to UNS S66286)

RATIONALE

AMS5731L 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, flash welded rings, and stock for forging, flash welded rings, or heading.

1.2 Application

These products have been used typically for parts, such as flanges, cases, and fasteners, requiring moderate strength up to 1300 °F (704 °C) and oxidation resistance up to 1500 °F (816 °C), particularly those which are formed or welded and then heat treated to develop required properties, 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
AMS 2374	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloy Forgings

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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
AMS 7490	Rings, Flash Welded, Corrosion and Heat-Resistant Austenitic Steels, Austenitic-Type Iron, Nickel, or Cobalt Alloys, or Precipitation-Hardenable Alloys

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 B 660	Packaging/Packing of Aluminum and Magnesium Products
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, Mechanical Tubing, and Flash Welded Rings

Solution 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.

3.3.1.4 Flash Welded Rings

Shall not be supplied unless specified or permitted on purchaser's part drawing. When supplied, rings shall be manufactured in accordance with AMS 7490.

3.3.2 Stock for Forging, Flash Welded Rings, or Heading

As ordered by the forging, flash welded ring, or heading manufacturer.

3.4 Heat Treatment

Bars, wire, forgings, mechanical tubing, and flash welded rings shall be solution heat treated by heating to 1800 °F ± 25 (982 °C ± 14), holding at heat for a time commensurate with cross-sectional thickness, and quenching in oil, water, or other medium acceptable to purchaser. Pyrometry shall be in accordance with AMS 2750.

3.5 Properties

Product 5.0 inches (127 mm) and under in nominal diameter or least distance between parallel sides 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, Mechanical Tubing, and Flash Welded Rings

3.5.1.1 As Solution Heat Treated

3.5.1.1.1 Wire and Bars 0.500 Inch and Below

Wire, and bars 0.500 inch and below shall have tensile strength not higher than 105 ksi (724 MPa) or equivalent hardness (See 8.2).

3.5.1.1.2 Bars over 0.500 Inch, and Mechanical Tubing

Bars over 0.500 inch, and mechanical tubing shall have hardness not higher than 201 HB, or equivalent (See 8.3), determined approximately midway between outer surface and center or inner surface as applicable.

3.5.1.1.3 Forgings and Flash Welded Rings

Forgings and flash welded rings shall have hardness not higher than 201 HB, or equivalent (See 8.3).