



AEROSPACE MATERIAL SPECIFICATION	AMS5731™	REV. M
	Issued 1963-01 Reaffirmed 2018-10 Revised 2023-09	
Superseding AMS5731L		
(R) Steel, Corrosion- and Heat-Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings, and Stock for Forgings, Rings, or Heading 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V (A286) Consumable Electrode Remelted, 1800 °F (982 °C) Solution Heat Treated Precipitation Hardenable (Composition similar to UNS S66286)		

RATIONALE

AMS5731M is the result of a Five-Year Review and update of the specification. The revision revises the Title to match the Scope, clarifies size limits and prohibits exceptions (see 1.1, 3.5.4, 3.8, 4.4.2, 5.2.1.1, and 8.7), updates composition testing and reporting (see 3.1 and 3.1.1), limits cutting bar from larger products (see 3.3.1.1.3 and 4.4.3), adds option for continuous heat treatment (see 3.4.1), updates tensile test requirements including strain rate control during testing (see 3.5.1.2.1), adds quality requirements (see 3.6.1 and 8.5), provides for forging stock properties (see 4.4.4 and 8.8), updates packaging (see 5.3), and allows the use of prior revisions.

1. SCOPE

1.1 Form

This specification covers a corrosion- and heat-resistant steel in the form of bars, wire, forgings, mechanical tubing, and flash welded rings up to 5.00 inches (127 mm), inclusive, in nominal diameter or least distance between parallel sides (thickness) and stock for forging, flash welded rings, or heading of any size.

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.

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2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2241	Tolerances, Corrosion- and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
AMS2243	Tolerances, Corrosion and Heat-Resistant Steel Tubing
AMS2248	Chemical Check Analysis Limits, Corrosion- and Heat-Resistant Steels and Alloys, Maraging and Other Highly Alloyed Steels, and Iron Alloys
AMS2371	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS2374	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloy Forgings
AMS2750	Pyrometry
AMS2806	Identification Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels, and Corrosion and Heat-Resistant Steels and Alloys
AMS2808	Identification, Forgings
AMS7490	Rings, Flash Welded, Corrosion and Heat-Resistant Austenitic Steels, Austenitic-Type Iron, Nickel or Cobalt Alloys, or Precipitation-Hardenable Alloys
AS1182	Standard Stock Removal Allowance, Aircraft-Quality and Premium Aircraft-Quality Steel, Bars and Mechanical Tubing
AS7766	Terms Used in Aerospace Metals Specifications

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 A370	Mechanical Testing of Steel Products
ASTM A751	Chemical Analysis of Steel Products
ASTM E139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E140	Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness
ASTM E292	Conducting Time-for-Rupture Notch Tension Tests of Materials

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751 or by other analytical methods acceptable to the 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 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection unless limits of acceptability are specified by the purchaser.

3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Melting Practice

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

3.3 Condition

3.3.1 Bars, Wire, Forgings, Mechanical Tubing, and Flash Welded Rings

Bars, wire, forgings, mechanical tubing, and flash welded rings shall be 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.

3.3.1.1.3 Bars shall not be cut from plate (see 4.4.3).

3.3.1.2 Forgings

Forgings shall be descaled.