



AEROSPACE MATERIAL SPECIFICATION

AMS5743™**REV. L**

Issued 1957-09
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Revised 2025-09

Superseding AMS5743K

(R) Steel, Corrosion- and Heat-Resistant, Bars, Forgings and Forging Stock,
15.5Cr - 4.5Ni - 2.9Mo - 0.10N (AM 355®),
Consumable Electrode Remelted,
Solution Heat Treated, Subzero Cooled, Equalized, and Over-Tempered
(Composition similar to UNS S35500)

RATIONALE

AMS5743L is the result of a Five-Year Review and update of the specification. The revision updates the Title to match the Scope and adds the trade name/trademark for information (see 8.8), revises composition reporting requirements (see 3.1.1), updates heat-treatment requirements into a Table format and adds pyrometry controls (see 3.4 and 3.4.1), revises strain rate requirements (see 3.5.1.2.1.1), adds finish requirements and guidance (see 3.6.2 and 8.5), adds reporting to MMPDS (see 3.8 and 8.7), clarifies bar reporting (see 4.4.2), addresses additional forging stock options (see 4.4.3 and 8.9), and updates the exceptions requirements (see 8.6).

1. SCOPE

1.1 Form

This specification covers a corrosion- and heat-resistant steel in the form of bars, forgings, and forging stock.

1.2 Application

These products have been used typically for parts requiring oxidation resistance and high strength up to 800 °F (427 °C) and where such parts may require welding during fabrication, 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 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), www.sae.org.

AMS2241 Tolerances, Corrosion- and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire

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Documents

Standard, visit Sharing Hub

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
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 E140	Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

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	0.10	0.15
Manganese	0.50	1.25
Silicon	--	0.50
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	15.00	16.00
Nickel	4.00	5.00
Molybdenum	2.50	3.25
Nitrogen	0.07	0.13

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 multiple melted using consumable electrode practice in the remelt cycle.

3.3 Condition

The product shall be supplied in the following condition:

3.3.1 Bars

Bars shall be solution heat treated, subzero cooled, equalized, over-tempered, and descaled.

3.3.1.1 Rounds

Round bars shall be ground, turned, or polished after heat treatment.

3.3.1.2 Shapes

Shaped bars shall be cold finished prior to heat treatment.

3.3.1.3 Flats

Flat bars shall be hot finished prior to heat treatment.

3.3.1.4 Bars shall not be cut from plate (see 4.4.2).

3.3.2 Forgings

Forgings shall be solution heat treated, subzero cooled, equalized, and over-tempered.

3.3.3 Forging Stock

Forging stock shall be as ordered by the forging manufacturer.

3.4 Heat Treatment

Bars and forgings shall be heat treated in accordance with the steps defined in Table 2.

Table 2 - Heat treatment

Step	Temperature	Hold Time	Cooling (unless otherwise noted)
Solution Heat Treat	1900 °F ± 25 °F (1038 °C ± 14 °C)	1 to 3 hours	Cooling as rapidly as possible to room temperature
Subzero Cooling	-100 °F (-73 °C) or colder	3 hours minimum	Warming in air to room temperature
Equalization	1425 °F ± 50 °F (774 °C ± 28 °C)	3 hours minimum	Cooling in air to not higher than 80 °F (27 °C)
Over-Temper	1075 °F ± 25 °F (579 °C ± 14 °C)	3 hours minimum	Cooling in air