



AEROSPACE MATERIAL SPECIFICATION	AMS5900™	REV. D
	Issued 1981-07 Reaffirmed 2013-08 Revised 2025-02	
	Superseding AMS5900C	
Steel Bars, Wire, Forgings, Mechanical Tubing and Forging Stock, Corrosion Resistant 14Cr - 2.1Mo - 0.30Cb (Nb) - 1.0V (1.05 - 1.15C) Premium Aircraft Quality for Bearing Applications, Double Vacuum Melted, Annealed (Composition similar to UNS S42800)		

RATIONALE

AMS5900D is the result of a Five-Year Review and update of the specification. The revision updates the Title to include the condition and applicable forms, addresses composition reporting (see 3.1.1), clarifies macrostructure requirements (see 3.4.1 and 8.8), revises decarburization measurement methods (see 3.4.4.5), clarifies quality requirements for bar (see 3.5.2 and 8.6), updates bar from plate reporting (see 4.4.2), permits additional forging stock properties to be specified (see 4.4.4 and 8.8), and updates the prohibition of exceptions requirements (see 8.7).

1. SCOPE

1.1 Form

This specification covers a premium aircraft-quality, corrosion-resistant steel in the form of bars, wire, forgings, mechanical tubing, and forging stock.

1.2 Application

These products have been used typically for critical bearing components requiring a through-hardening, corrosion-resistant steel operating under heavy loads and high speeds at moderate temperatures and subject to very rigid inspection standards, 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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Documents

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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
AMS2300	Steel Cleanliness, Premium Aircraft-Quality, Magnetic Particle Inspection Procedure
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
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 A604	Macroetch Testing of Consumable Electrode Remelted Steel Bars and Billets
ASTM A751	Chemical Analysis of Steel Products
ASTM E45	Determining the Inclusion Content of Steels
ASTM E112	Determining the Average Grain Size
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 E1077	Estimating the Depth of Decarburization of Steel Specimens

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 E1077 or by other analytical methods acceptable to the purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	1.05	1.15
Manganese	0.25	0.50
Silicon	0.20	0.40
Phosphorus	--	0.015
Sulfur	--	0.010
Chromium	13.75	14.75
Molybdenum	1.90	2.25
Columbium (Niobium)	0.25	0.35
Vanadium	0.90	1.15
Nickel	--	0.35
Copper	--	0.35

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

Product shall be multiple melted using vacuum induction melting practice followed by vacuum consumable electrode remelting.

3.3 Condition

The product shall be supplied in the following condition; hardness and tensile strength shall be determined in accordance with ASTM A370:

3.3.1 Bars

Bars shall be annealed having hardness not higher than 255 HB, or equivalent (see 8.2).

3.3.1.1 All hexagons and other bars 2.75 inches (69.8 mm) and under in nominal diameter or distance between parallel sides shall be cold finished.

3.3.1.2 Bars, other than hexagons, over 2.75 inches (69.8 mm) in nominal diameter or distance between parallel sides shall be hot finished.

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

3.3.2 Wire

Wire shall be cold finished and annealed having a tensile strength not higher than 130 ksi (896 MPa), except that for wire 0.062 inch (1.57 mm) and under in nominal diameter tensile strength shall be as agreed upon by the purchaser and producer.