



AEROSPACE MATERIAL SPECIFICATION

AMS6532™**REV. J**Issued 1992-07
Revised 2022-01

Superseding AMS6532H

Steel, Bars and Forgings, and Forging Stock
3.1Cr - 11.5Ni - 13.5Co - 1.2Mo (0.21 - 0.25C)
Vacuum Melted, Normalized and Overaged
Precipitation Hardenable
(Composition similar to UNS K92580)

RATIONALE

AMS6532J is the result of a Five-Year Review and update of the specification. The revision updates the title to match the scope, updates the form to address size limits within the specification (1.1), updates the prohibition on substitutions (3.5.4.1.5, 8.6), incorporates AS6279 as a requirement (3.8), incorporates tables for clarity (Table 4 and 7), and adds additional notes on AS1182 (8.5).

1. SCOPE

1.1 Form

This specification covers a premium aircraft-quality alloy steel in the form of bars, forgings 100 square inches (645 cm²) and under in cross-sectional area and forging stock of any size.

1.2 Application

These products have been used typically for heat treated parts requiring a combination of high strength, high toughness, and weldability, 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 +1 724-776-4970 (outside USA), www.sae.org.

AMS2248 Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys

AMS2251 Tolerances, Low-Alloy Steel Bars

AMS2300 Steel Cleanliness, Premium Aircraft-Quality, Magnetic Particle Inspection Procedure

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Full document details: SAE AMS6532J

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Documents

Document Sharing Hub

AMS2310	Qualification Sampling and Testing of Steels for Transverse Tensile Properties
AMS2370	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock
AMS2372	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel 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
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications
AS1182	Standard Stock Removal Allowance, Aircraft-Quality and Premium Aircraft-Quality Steel Bars and Mechanical Tubing
AS6279	Standard Practice for Production, Distribution, and Procurement of Metal Stock

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	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM E45	Determining the Inclusion Content of Steel
ASTM E112	Determining 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 E399	Plane-Strain Fracture Toughness of Metallic Materials
ASTM E1077	Estimating the Depth of Decarburization of Steel Specimens

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 purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	0.21	0.25
Manganese	--	0.10
Silicon	--	0.10
Phosphorus	--	0.008
Sulfur	--	0.005
Phosphorus + Sulfur	--	0.010
Chromium	2.90	3.30
Nickel	11.00	12.00
Cobalt	13.00	14.00
Molybdenum	1.10	1.30
Titanium	--	0.015
Aluminum	--	0.015
Oxygen	--	0.0020 (20 ppm)
Nitrogen	--	0.0015 (15 ppm)

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Melting Practice

Steel shall be multiple melted using vacuum induction melting followed by vacuum arc remelting.

3.3 Condition

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

3.3.1 Bars

Normalized and overaged, having hardness not higher than 372 HB, or equivalent (see 8.2), and ground or turned. Bar shall not be cut from plate (also see 4.4.2).

3.3.2 Forgings

Normalized and overaged, having hardness not higher than 372 HB, or equivalent (see 8.2), and descaled.

3.3.3 Forging Stock

As ordered by the forging manufacturer.

3.4 Heat Treatment

Shall conform to the following:

3.4.1 Bars and Forgings

Shall be normalized by heating to 1650 °F ± 25 °F (899 °C ± 14 °C), holding at heat for 60 minutes ± 15 minutes, and cooling in air to a temperature between 45 °F and 200 °F (7 °C and 93 °C), and overaged by heating to 1250 °F ± 25 °F (677 °C ± 14 °C), holding at heat for 16 hours minimum, and air cooled. Pyrometry shall be in accordance with AMS2750.

3.4.2 Forging Stock

As ordered by the forging manufacturer.