



AEROSPACE MATERIAL SPECIFICATION

AMS6556™**REV. A**

Issued 2013-08
Revised 2018-06
Reaffirmed 2023-05

Superseding AMS6556

Steel, Bars, Wire, and Forgings
8V - 4Cr - 4W - 3Mo (2.45 - 2.55C)
Powder Metallurgy Product
Hot Isostatically Pressed
(Compositions similar to UNS T11453)

RATIONALE

AMS6556A results from a Five-Year Review and update of this specification that revises composition analytical methods (3.1), decarburization (3.4.3), and quality (3.5.2), adds no unauthorized exceptions (3.7), and revises reports (4.4) and identification (5.2).

AMS6556A has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

1.1 Form

This specification covers a premium aircraft-quality, high-alloy steel gas-atomized and HIP-consolidated in the form of bars, wire, forgings, and forging stock.

1.2 Application

These products have been used typically for critical parts, such as bearings 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.

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

AMS2370 Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock

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For more information on this standard, visit
<https://www.sae.org/standards/content/AMS6556A>

Documents
Document Sharing Hub

AMS2372	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Forgings
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

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A370	Mechanical Testing of Steel Products
ASTM A751	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM E45	Determining the Inclusion Content of Steel
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 E384	Microindentation Hardness of Materials
ASTM E1077	Standard Test Methods for Estimating the Depth of Decarburization of Steel Specimens

2.3 European Committee for Standardization

Available from British Standards Institution Group, 389 Chiswick High Road, London, W4 4AL, United Kingdom, Tel: +44 (0)20 8996 9001, www.bsigroup.com.

Or:

National Standards Authority of Ireland, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland, Tel: +353 1 807 3800, www.nsai.ie.

EN 10228	Steel Cleanliness Non-Destructive Testing of Steel Forgings – Part 3: Ultrasonic Testing of Ferritic or Martensitic Steel
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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 A751 or by other analytical methods acceptable to purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	2.45	2.55
Manganese	0.20	0.60
Silicon	0.40	0.60
Phosphorus	--	0.030
Sulfur	--	0.020
Chromium	3.75	4.50
Nickel	--	0.50
Cobalt	--	1.00
Molybdenum	2.80	3.40
Tungsten	3.80	4.40
Vanadium	7.60	8.20

3.1.1 Check Analysis

Composition variations shall meet the requirements of AMS2248, except that carbon shall be $\pm 0.04\%$ and vanadium $\pm 0.10\%$.

3.2 Melting Practice

Steel shall be produced by inert gas atomization of pre-alloyed melts, with resulting powder consolidated via hot isostatic pressing (HIP). Sintering or the use of binders or fillers to consolidate powder is not permitted. Blending of elemental powders to achieve the required chemical composition is not permitted.

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

3.3.1.1 Annealed material shall have hardness not higher than 310 BHN, or equivalent hardness (see 8.2).

3.3.1.2 Hot-drawn material shall have hardness not higher than 340 BHN, or equivalent hardness (see 8.2).

3.3.2 Wire

Hot finished having tensile strength not higher than 177 ksi (1220 MPa), or equivalent hardness (see 8.3).

3.3.3 Forgings

As ordered.

3.3.4 Forging Stock

As ordered by the forging manufacturer.