

**AEROSPACE
MATERIAL
SPECIFICATION**



AMS 6442G

Issued JUL 1948
Revised APR 1987
Noncurrent FEB 1998
Cancelled SEP 2003
Superseding AMS 6442F

Steel Bars and Forgings
0.50Cr (0.98 - 1.10C) (SAE 50100)
For Bearing Applications

G50986

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of September, 2003. By this action, this document will remain listed in the numerical section of the Index of Aerospace Materials Specifications.

Similar, but not necessarily identical products, are covered by the following specifications:

AMS 6440 Steel, Bars, Forgings, and Tubing, 1.45Cr (0.98 - 1.10C) for Bearing Applications

AMS 6444 Steel, Bars, Forgings, and Tubing, 1.45Cr (0.98 - 1.10C) Premium Aircraft-Quality, Consumable Vacuum Electrode Melted

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1. SCOPE:

1.1 Form:

This specification covers a low-alloy steel in the form of bars, forgings, and forging stock.

1.2 Application:

Primarily for parts of small cross-section, such as needle bearings, requiring a through hardening steel usually with hardness of approximately 60 HRC and subject to very rigid inspection standards.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

- AMS 2251 Tolerances, Low-Alloy Steel Bars
- MAM 2251 Tolerances, Metric, Low-Alloy Steel Bars
- AMS 2259 Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
- AMS 2350 Standards and Test Methods
- AMS 2370 Quality Assurance Sampling of Carbon and Low-Alloy Steels, Wrought Products Except Forgings and Forging Stock
- AMS 2372 Quality Assurance Sampling of Carbon and Low-Alloy Steels, Forgings and Forging Stock
- AMS 2375 Control of Forgings Requiring First Article Approval
- AMS 2806 Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Heat and Corrosion Resistant Steels and Alloys
- AMS 2808 Identification, Forgings

2.2 ASTM Publications:

Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

- ASTM A370 Mechanical Testing of Steel Products
- ASTM E45 Determining the Inclusion Content of Steels
- ASTM E350 Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron
- ASTM E381 Macroetch Testing, Inspection, and Rating Steel Products, Comprising Bars, Billets, Blooms, and Forgings

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E350 or by spectrographic or other analytical methods approved by purchaser:

	min	max
Carbon	0.98	1.10
Manganese	0.25	0.45
Silicon	0.15	0.35
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	0.40	0.60
Nickel	--	0.25
Molybdenum	--	0.06
Copper	--	0.35

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition:

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

3.2.1 Bars:

3.2.1.1 Bars 0.500 In. (12.50 mm) and Under in Nominal Diameter or Distance Between Parallel Sides: Cold finished, with microstructure of spheroidized cementite in ferrite matrix, having tensile strength not higher than 120,000 psi (825 MPa) or equivalent hardness.

3.2.1.2 Bars Over 0.500 In. (12.50 mm) in Nominal Diameter or Distance Between Parallel Sides: Hot finished and annealed, with microstructure of spheroidized cementite in ferrite matrix, having hardness not higher than 207 HB, or equivalent, except that bars ordered cold finished may have hardness as high as 248 HB, or equivalent.