

Steel, Corrosion-Resistant, Bars, Wire, and Forgings
17Cr - 0.52Mo (0.95 - 1.20C) (440C)
(Composition similar to UNS S44004)

RATIONALE

AMS5630L removes the requirements for microinclusion rating, grain size, and conformance to AMS2303 introduced at revision K. This results in changes to Acceptance Tests (4.2.1) and Reports (4.4).

1. SCOPE

1.1 Form

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

1.2 Application

These products have been used typically for parts requiring hardness up to 58 HRC and resistance to wear, corrosion, and oxidation, 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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2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

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

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 A 370	Mechanical Testing of Steel Products
ASTM E 353	Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys
ASTM E 381	Macroetch Testing Steel Bars, Billets, Blooms, and Forgings
ASTM E 384	Knoop and Vickers Hardness of Materials

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 E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - COMPOSITION

Element	min	max
Carbon	0.95	1.20
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	16.00	18.00
Molybdenum	0.40	0.65
Nickel	--	0.75
Copper	--	0.50

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Condition

The product shall be supplied in the following condition; hardness and tensile strength shall be determined in accordance with ASTM A 370:

3.2.1 Bars

Annealed having a hardness not higher than 255 HB, or equivalent (See 8.2). Bars shall not be cut from plate (See 4.4.2).

3.2.1.1 Bars 2.750 Inches (69.85 mm) and Under in Nominal Diameter or Least Distance Between Parallel Sides and All Hexagons

Cold finished.

3.2.1.2 Bars, Other Than Hexagons, Over 2.750 Inches (69.85 mm) in Nominal Diameter or Least Distance Between Parallel Sides

Hot finished or cold finished.

3.2.2 Wire and Bars Under 0.500 Inch

Cold finished having tensile strength not higher than 130 ksi (896 MPa) or equivalent hardness (See 8.3).

3.2.3 Forgings

As ordered.

3.2.4 Forging Stock

As ordered by the forging manufacturer.

3.3 Properties

The product shall conform to the following requirements; hardness testing shall be performed in accordance with ASTM A 370:

3.3.1 Macrostructure

Visual examination of transverse sections from bars, billets, and forging stock, etched in hot hydrochloric acid in accordance with ASTM E 381, shall show no imperfections such as pipe or cracks. Standards for porosity, segregation, inclusions, and other imperfections as defined in the macrographs of ASTM E 381 may be agreed upon by purchaser and vendor.

3.3.2 Response to Heat Treatment

Specimens as in 4.3.3, protected by suitable means or treated in a neutral atmosphere to minimize scaling and prevent either carburization or decarburization, shall have hardness not lower than 58 HRC, or equivalent (See 8.2), after being heated to 1925 °F ± 25 (1052 °C ± 14), held at heat for 30 minutes ± 3, and quenched in oil.

3.3.2.1 Sub-zero cooling to -100 °F ± 20 (-73 °C ± 11), holding at that temperature for 2 hours ± 0.25, and warming in air to room temperature, after heating as in 3.3.2, is optional.