



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 10001

AMS 5845

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Revised

ALLOY BARS, HIGH STRENGTH, CORROSION RESISTANT
35Ni - 35Co - 20Cr - 10Mo
Solution Heat Treated, Cold Drawn, Aged, Centerless Ground

1. SCOPE:

- 1.1 Form: This specification covers a high-strength, corrosion-resistant alloy in the form of bars.
- 1.2 Application: Primarily for applications requiring high strength, good tension-tension fatigue strength, toughness, ductility, and exceptionally good corrosion resistance.
2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., Two Pennsylvania Plaza, New York, New York 10001.

2.1.1 Aerospace Material Specifications:

- AMS 2261 - Tolerances, Nickel, Nickel Base, and Cobalt Base Alloy Bars and Forging Stock
- AMS 2269 - Chemical Check Analysis Limits, Wrought Nickel and Nickel Base Alloys
- AMS 2350 - Standards and Test Methods
- AMS 2371 - Quality Assurance Sampling of Corrosion and Heat Resistant Alloys, Wrought Products Except Forgings

- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

- ASTM E8 - Tension Testing of Metallic Materials
- ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
- ASTM E112 - Estimating Average Grain Size of Metals
- ASTM E354 - Chemical Analysis of High Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt-Base Alloys

- 2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

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	min	max
Carbon	--	0.025
Manganese	--	0.15
Silicon	--	0.15
Phosphorus	--	0.015
Sulphur	--	0.010
Chromium	19.00 - 21.00	
Nickel	33.00 - 37.00	
Molybdenum	9.00 - 10.50	
Iron	--	1.00
Titanium	--	1.00
Cobalt	remainder	

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2269.

3.2 Condition: Solution heat treated, cold drawn, aged, and centerless ground.

3.3 Heat Treatment: Bars shall be solution heat treated by heating to $1925\text{ F} \pm 25$ ($1051.7\text{ C} \pm 14$), holding at heat for 1 - 2 hr, and cooling in air to room temperature. After cold drawing, the bars shall be aged by heating to a temperature within the range 1000 - 1100 F ($537.8 - 593.3\text{ C}$), holding at the selected temperature within $\pm 25\text{ F}$ ($\pm 14\text{ C}$) for 4 hr, and cooling.

3.4 Properties: The product shall conform to the following requirements:

3.4.1 Tensile Properties: Shall be as follows, determined in accordance with ASTM E8, with axis of specimen coinciding with the axis of the bar:

Tensile Strength, min	260,000 psi (1793 MPa)
Yield Strength at 0.2% Offset, min	230,000 psi (1586 MPa)
Elongation in 2 in. (50.8 mm) or 4D, min	8%
Reduction of Area (round specimens), min	35%

3.4.2 Hardness: Not lower than 44 HRC or equivalent, determined in accordance with ASTM E18.

3.4.3 Grain Size: Predominantly 4 or finer with occasional grains as large as 2 permissible, determined by comparison of a polished and etched specimen with the chart in ASTM E112.

3.5 Quality: Material shall be produced by multiple melting using vacuum induction followed by vacuum consumable electrode melting practice. The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

3.6 Sizes: Except when exact lengths or multiples of exact lengths are ordered, bars will be acceptable in mill lengths of 6 - 20 ft (1.8 - 6.1 m) but not more than 10% of any shipment shall be supplied in lengths shorter than 10 ft (3 m).

3.7 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2261.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of bars shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the bars conform to the requirements of this specification.