



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AMS 7805A

Superseding AMS 7805

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MOLYBDENUM BARS Arc-Cast, Stress Relieved

1. SCOPE:

1.1 Form: This specification covers vacuum-arc-cast molybdenum in the form of wrought round bars.

1.2 Application: Primarily for parts requiring high modulus and uniform strength up to 1800° F (975° C). This material is not recommended for use in oxidizing atmospheres above 1000° F (540° C) unless protected by a suitable coating.

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., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

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

ASTM E8 - Tension Testing of Metallic Materials

ASTM E92 - Vickers Hardness of Metallic Materials

ASTM E350 - Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

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

2.3.1 Federal Standards:

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

2.3.2 Military Standards:

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

2.4 ANSI Publications: Available from American National Standards Institute, 1430 Broadway, New York, NY 10018.

ANSI B46.1 - Surface Texture

REAFFIRMED

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Documents



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3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight; carbon shall be determined in accordance with ASTM E350, molybdenum by difference, gaseous elements by vacuum fusion, and other metallic elements by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

		min	max	Check Analysis Over Max
Ø	Molybdenum	99.95	--	--
	Carbon	--	0.030	0.005
	Iron	--	0.008	0.002
	Silicon	--	0.008	0.002
	Nickel	--	0.002	0.002
	Nitrogen	--	0.002 (20 ppm)	0.0005 (5 ppm)
	Oxygen	--	0.0015 (15 ppm)	--
	Hydrogen	--	0.0005 (5 ppm)	--

- 3.2 Condition: Hot-cold worked, descaled, and stress-relieved; when so specified bars shall be centerless ground to a surface texture of 90 microinches (2.3 µm) or smoother, determined in accordance with ANSI B46.1.

- 3.3 Properties: Bars 0.125 to 4.500 in. (3.18 to 114.30 mm), incl, in nominal diameter shall conform to the following requirements; bars under 0.125 in. (3.18 mm) or over 4.500 in. (114.30 mm) in nominal diameter shall have tensile properties and hardness as agreed upon by purchaser and vendor:

3.3.1 As-Received:

- 3.3.1.1 Tensile Properties: Shall be as specified in Table I, determined in accordance with ASTM E8 with the rate of strain maintained at 0.002 - 0.005 in. per in. per min. (0.002 - 0.005 (mm/mm)/min.) through the 0.6% offset and 0.02 - 0.05 in. per in. per min. (0.02 - 0.05 (mm/mm)/min.) above the 0.6% offset to fracture.

TABLE I

Nominal Diameter Inches		Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 4D %, min
Ø	0.125 to 0.281, incl	95,000	80,000	30
	Over 0.281 to 0.406, incl	90,000	75,000	25
	Over 0.406 to 0.875, incl	90,000	75,000	20
	Over 0.875 to 1.125, incl	85,000	70,000	20
	Over 1.125 to 1.875, incl	75,000	65,000	15
	Over 1.875 to 2.875, incl	70,000	60,000	15
	Over 2.875 to 3.500, incl	70,000	60,000	10
	Over 3.500 to 4.500, incl	65,000	55,000	10