AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 7805

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Revised

MOLYBDENUM RODS
Arc Cast, Stress Relieved

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for parts requiring high modulus and uniform strength characteristics up to at least 1800 F. This material is not recommended for use in oxidizing atmospheres at 1000 F and above unless protected by a suitable coating.

3. COMPOSITION:

			Check Analysis	
			Under Min	Over Max
Molybdenum	99.90	min (1)		
Carbon	0.010 -	0.040	0.005	0.005
Iron	0.020	max	-	0.002
Silicon	0.010	max	-	0.002
Oxygen	0.0030	(30 ppm) max (2)	-	-
Nickel	0.010	max	-	0.001
Nitrogen	0.0010	(10 ppm) max (2)	-	0.0005 (5 ppm)

(1) Routine determination not required.
(2) Pending establishment of approved methods of analysis, deviation from these limits alone shall not be cause for rejection.

4. CONDITION: Hot cold worked, descaled, and stress relieved or, if so specified, hot cold worked, descaled, centerless ground, and stress relieved.

5. TECHNICAL REQUIREMENTS:

5.1 The product shall conform to the following requirements and shall be capable of meeting these requirements after being heated to 1800 F ± 25, held at heat for 30 min. in a suitable controlled atmosphere, and cooled rapidly.

5.1.1 Hardness:

Nominal Diameter or Distance Between Parallel Sides Inches	Hardness, Vickers (10kg) Max
0.188 to 0.875, incl	280
Over 0.875 to 1.125, incl	270
Over 1.125 to 1.875, incl	260
Over 1.875 to 2.875, incl	250
Over 2.875 to 3.500, incl	240

5.1.2 Tensile Properties: Material shall conform to the following requirements when tested at room temperature using strain rates of 0.003 - 0.007 in. per in. per min. through the yield strength and 0.010 - 0.030 in. per in. per min. between yield and ultimate.

Nominal Diameter or Distance Between Parallel Sides Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 46,000,000)		Elong. % in 2 in.
		psi, min	Extension Under Load in. in 2 in.	
0.188 to 0.875, incl	90,000	75,000	0.0073	18
Over 0.875 to 1.125, incl	85,000	70,000	0.0070	15
Over 1.125 to 1.875, incl	75,000	65,000	0.0068	10
Over 1.875 to 2.875, incl	70,000	60,000	0.0066	10
Over 2.875 to 3.500, incl	65,000	55,000	0.0064	10

5.1.2.1 Properties of rod under 3/16 in. in diameter or distance between parallel sides shall be as agreed upon between purchaser and vendor.

6. QUALITY: Material shall be vacuum arc melted using consumable electrode practice. The product shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES:

7.1 Hot-Cold Worked and Descaled:

Nominal Diameter or Distance Between Parallel Sides Inches	Tolerance, Inch		Out of Round Inch
	Plus	Minus	
0.062 to 0.281, incl	0.002	0.002	0.004
Over 0.281 to 0.406, incl	0.010	0.005	0.008
Over 0.406 to 0.625, incl	0.010	0.005	0.012
Over 0.625 to 0.875, incl	0.015	0.005	0.015
Over 0.875 to 1.000, incl	0.020	0.005	0.015
Over 1.000 to 1.375, incl	0.020	0.010	0.018
Over 1.375 to 1.500, incl	0.020	0.015	0.020
Over 1.500 to 1.625, incl	0.025	0.015	0.020
Over 1.625 to 2.000, incl	0.030	0.020	0.025
Over 2.000 to 2.500, incl	0.032	0.032	0.025
Over 2.500 to 3.250, incl	0.032	0.032	0.027
Over 3.250 to 3.500, incl	0.045	0.045	0.040

7.2 Centerless Ground:

Nominal Diameter Inches	Tolerance, Inch Plus and Minus
0.0625 to 2.000, incl	0.002
Over 2.000	0.003