

AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 4631c

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

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ALUMINUM BRONZE 90.5Cu - 7.5Al - 1.9Si

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **FORM:** Rods, bars, forgings, and forging stock.
3. **APPLICATION:** Primarily for parts requiring strength and wear resistance at moderate temperatures. This material has slightly more resistance to corrosion than AMS 4630.

4. **COMPOSITION:**

Copper	89.0 min
Aluminum	6.5 - 8.5
Silicon	1.6 - 2.25
Total Named Elements	99.5 min

5. **CONDITION:**

- 5.1 **Rods and Bars:** Hot rolled or drawn, or extruded, then cold finished if necessary, and stress relieved.
- 5.2 **Forgings:** Stress relieved.
- 5.3 **Forging Stock:** As ordered by the forging manufacturer.

6. **TECHNICAL REQUIREMENTS:**

6.1 **Tensile Properties:**

6.1.1 **Rods and Bars:**

Nominal Diameter or Distance Between Parallel Sides Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E=16,000,000)		Elongation % in 4D, min
		psi, min	Extension Under Load in. in 2 in.	
0.5 and under	90,000	45,000	0.0096	15
Over 0.5 to 1.0, incl	88,000	44,000	0.0095	15
Over 1.0 to 2.0, incl	85,000	42,500	0.0093	20
Over 2.0 to 3.0, incl	75,000	37,500	0.0087	30

- 6.1.1.1 Tensile test specimens from rods and bars over 1.5 in. in diameter or distance between parallel sides shall have their axes located approximately midway between center and surface.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no obligation to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the reports are responsible for protecting themselves against infringement of patents."

- 6.2 Hardness: Material, including forgings but excluding forging stock, shall have hardness not lower than Brinell 130, using 1000 kg load, or equivalent hardness by other methods, on the surface, except on rounds, where a flat as necessary for accuracy may be made, or not lower than Rockwell B 80 when taken half-way between center and surface of the cross section.
- 6.3 Mercurous Nitrate Test: Test specimens as in 6.3.1 and 6.3.2 shall be capable of \emptyset withstanding, without cracking, testing in accordance with ASTM B154-51, Procedure A.
- 6.3.1 Rods and Bars: Test specimens shall be of full cross section and shall have length of either 6 in. or twice the diameter or minimum distance between parallel sides, whichever is greater.
- 6.3.2 Forgings: Test specimens may be any convenient size or shape, or an entire forging may be used.
7. QUALITY: Material shall be uniform in quality and condition, clean, sound, smooth, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.
8. TOLERANCE: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2221 as applicable. Diameter, thickness, and width tolerances shall be as specified below:
- 8.1 Rounds, Hexagons, and Octagons: Table I, Refractory.
- 8.2 Squares: Table IV.
- 8.3 Rectangles, Thickness: Table IV.
- 8.4 Rectangles, Width: Table VII, Refractory.
9. REPORTS:
- 9.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and technical requirements of this specification. This report shall include the purchase order number, material specification number, size, and quantity. If forgings are supplied, the part number and size of stock used to make the forgings shall also be included.
- 9.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.