AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 4610 F

Issued 12-5-39
Revised 6-15-53

BRASS, FREE CUTTING
61.5Cu - 3Pb - 35.5Zn
Half Hard

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

2. FORM: Rods and bars.

3. APPLICATION: Primarily for screw machine parts.

4. COMPOSITION:

Copper	60.0 - 63.0
Lead	2.5 - 3.75
Iron	0.15 max
Total Other Elements	0.5 max
Zinc	remainder

5. CONDITION: Cold finished, half hard temper.

6. TECHNICAL REQUIREMENTS:

6.1 Tensile Properties:

Nominal Diameter or Distance Between Parallel Sides, Inches	Tensile Strength, psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 15,000,000) psi, min	Extension Under Load, in. in 2 in.	Elongation, % in 4D, min
Rounds, Hexagons, Octagons				
0.5 and under	60,000	28,000	0.0077	10
Over 0.5 to 1.0, incl	55,000	25,000	0.0073	15
Over 1.0 to 2.0, incl	50,000	20,000	0.0067	20
Over 2.0	45,000	15,000	0.0060	25
Squares, Rectangles				
0.5 and under thick 1.0 and under wide	50,000	25,000	0.0073	10
0.5 and under thick Over 1.0 to 6.0, incl, wide	45,000	17,000	0.0063	15
Over 0.5 to 2.0, incl, thick 2.0 and under, wide	45,000	17,000	0.0063	20
Over 0.5 to 2.0, incl, thick Over 2.0 to 6.0, incl, wide	40,000	15,000	0.0060	20
Over 2.0 thick Over 2.0 to 4.0, incl, wide	40,000	15,000	0.0060	20

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

6.2 Hardness: Material should have hardness as follows, or equivalent, but shall not be rejected on the basis of hardness if the tensile property requirements are met:

Nominal Diameter or Distance Between Parallel Sides, Inches	Hardness, Rockwell		
	Rounds	Hexagons Octagons	Squares Rectangles
1.0 and under	B 65-85	B 60-80	B 50-80
Over 1.0 to 2.0, incl	B 60-80	B 50-70	B 40-70
Over 2.0	B 60-80	B 45-65	B 40-70

6.2.1 Hardness determinations shall be made on the surface, except on rounds where a flat, as necessary for accuracy, may be made.

6.3 Mercurous Nitrate Test: Test specimens of full cross section having length of either 6 in. or twice the diameter or minimum distance between parallel sides, whichever is greater, shall, after cleaning, be capable of withstanding, without cracking, immersion for 30 min. in an aqueous solution containing 10 g of mercurous nitrate (11.4 g of $HgNO_3.2H_2O$ or 10.7 g of $HgNO_3.H_2O$) and 10 ml of nitric acid (sp gr 1.42) per liter of solution, using at least 10 ml of solution per sq in. of test specimen surface area.

7. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance or parts.

8. TOLERANCES: 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, Non-refractory.

8.2 Squares: Table III.

8.3 Rectangles, Thickness: Table III.

8.4 Rectangles, Width: Table VII, Non-refractory.

9. REPORTS:

9.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the requirements of this specification or stating that the chemical composition and tensile properties of the product conform to the requirements specified. This report shall include the purchase order number, material specification number, size, and quantity.