

# AERONAUTICAL MATERIAL SPECIFICATIONS

## AMS 4610H

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

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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 - 3.7   |
| Iron                  | 0.35 max    |
| Other Elements, total | 0.5 max     |
| Zinc                  | remainder   |

5. CONDITION: Cold finished, half hard temper.

6. TECHNICAL REQUIREMENTS:

- 6.1 Tensile Properties:

Yield Strength at 0.2% Offset  
or at Extension Indicated  
(E=15,000,000)

| Nominal Diameter or Distance<br>Between Parallel Sides<br>Inches | Tensile<br>Strength<br>psi, min | Yield Strength<br>psi, min | Extension<br>Under Load<br>in. in 2 in. | Elongation<br>% 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<br>1.0 and under wide                        | 50,000                          | 25,000                     | 0.0073                                  | 10                         |
| 0.5 and under thick<br>Over 1.0 to 6.0, incl, wide               | 45,000                          | 17,000                     | 0.0063                                  | 15                         |
| Over 0.5 to 2.0, incl, thick<br>2.0 and under wide               | 45,000                          | 17,000                     | 0.0063                                  | 20                         |

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## 6.1 Tensile Properties: (Continued)

| Nominal Diameter or Distance<br>Between Parallel Sides<br>Inches | Tensile<br>Strength<br>psi, min | Yield Strength at 0.2% Offset<br>or at Extension Indicated<br>( $E=15,000,000$ ) |   | Elongation<br>% in 4D, min |
|--|---------------------------------|--|---|----------------------------|
|  |                                 | psi, min   | Extension<br>Under Load<br>in. in 2 in. |                            |
| Squares, Rectangles (Continued)                                  |                                 |  |   |                            |
| Over 0.5 to 2.0, incl, thick                                     | 40,000                          | 15,000   | 0.0060                                  | 20                         |
| Over 2.0 to 6.0, incl, wide                                      |                                 |  |   |                            |
| Over 2.0 thick   | 40,000                          | 15,000   | 0.0060                                  | 20                         |
| Over 2.0 to 4.0, incl, wide                                      |                                 |  |   |                            |

6.1.1 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.

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<br>Between Parallel Sides<br>Inches | Hardness, Rockwell B |                      |                      |
|--|----------------------|----------------------|----------------------|
|  | Rounds               | Hexagons<br>Octagons | Square<br>Rectangles |
| 1.0 and under  | 65 - 85              | 60 - 80              | 50 - 80              |
| Over 1.0 to 2.0, incl  | 60 - 80              | 50 - 70              | 40 - 70              |
| Over 2.0   | 60 - 80              | 45 - 65              | 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 be capable of withstanding, without cracking, testing in accordance with ASTM B154-51, Procedure A.

7. QUALITY: Material 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.

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.