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

AMS 4119

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Revised

# ALUMINUM ALLOY BARS, ROLLED
## 4.5Cu - 1.5Mg - 0.6Mn (2024-T3510)
## Stress-Relief Stretched

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

2. FORM: Bars and rods.

3. APPLICATION: Primarily intended for machined parts subject to excessive warpage during machining due to residual stresses, and for parts requiring good strength and whose fabrication does not involve welding.

4. COMPOSITION:

| | |
|---|---|
| Copper | 3.8 - 4.9 |
| Magnesium | 1.2 - 1.8 |
| Manganese | 0.30 - 0.9 |
| Iron | 0.50 max |
| Silicon | 0.50 max |
| Zinc | 0.25 max |
| Chromium | 0.10 max |
| Other Impurities, each | 0.05 max |
| Other Impurities, total | 0.15 max |
| Aluminum | remainder |

5. CONDITION: Rolled or cold finished, solution heat treated, and stress-relieved by stretching.

5.1 Material shall be stretched in the solution heat treated condition to produce a nominal permanent set of 1-1/2%, but not less than 1% nor more than 3%.

5.2 Material shall receive no further straightening operations after stretching, unless specifically authorized.

6. TECHNICAL REQUIREMENTS:

6.1 Tensile Properties:

| | |
|---|---|
| Tensile Strength, psi | 62,000 min |
| Yield Strength at 0.2% Offset or at 0.0116 in. in 2 in. Extension Under Load (E = 10,500,000), psi | 40,000 min |
| Elongation, % in 4D | 10 min |

6.1.1 When a dispute occurs between purchaser and vendor over the yield strength value, yield strength determined by the offset method shall apply.

6.1.2 Tensile properties shall be as agreed upon by purchaser and vendor on material under 0.125 in., on rounds over 6.500 in. in diameter, on squares over 4.000 in., and on rectangles with a thickness over 4.000 in. or a maximum area of 36 sq inches.

6.2 Hardness: Not lower than Brinell 100 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball or not lower than Brinell 106 using 1000 kg load and 10 mm ball, but the product shall not be rejected on the basis of hardness if the requirements for tensile properties are met.

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. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2201 as applicable. Diameter, thickness, and width tolerances shall be as specified below:

8.1 Diameter: Table I.

8.2 Thickness and Width, Squares, Hexagons, and Rectangles: Table II.

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.

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.

10. IDENTIFICATION:

10.1 Unless otherwise specified, each bar and rod 0.25 in. and over in diameter, or equivalent, or which has at least one substantially flat unobstructed surface 0.50 in. or greater in width, shall be marked with the manufacturer's identification, and the alloy number and temper, or AMS 4119. The characters shall be of such size as to be clearly legible, shall be applied recurring at intervals not exceeding 3 ft using a suitable marking fluid, and shall not be obliterated by normal handling or heat treatment.

10.2 Bars and rods less than 0.25 in. in diameter, or equivalent, shall be identified as agreed upon by purchaser and vendor.