



AEROSPACE MATERIAL SPECIFICATIONS

AMS 4124

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

485 Lexington Ave., New York, N. Y. 10017

Issued 4-15-67

Revised

ALUMINUM ALLOY BARS, ROLLED OR COLD FINISHED 5.6Zn - 2.5Mg - 1.6Cu - 0.30Cr (7075-T7351) 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 for machined parts subject to excessive warpage during machining due to residual stresses, and for parts requiring high strength and resistance to stress corrosion cracking and whose fabrication does not involve welding or forming.
4. **COMPOSITION:**

	min	max
Zinc	5.1	6.1
Magnesium	2.1	2.9
Copper	1.2	2.0
Chromium	0.18	0.40
Iron	--	0.7
Silicon	--	0.50
Manganese	--	0.30
Titanium	--	0.20
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

5. **CONDITION:** Rolled or cold finished, solution heat treated, stress-relieved by stretching, and precipitation heat treated to develop the required mechanical properties and resistance to stress corrosion cracking.
 - 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:** The product shall conform to the following requirements; tensile properties shall be determined in accordance with the latest issue of AMS 2355.
 - 6.1 **Tensile Properties:** Except as specified in 6.1.2, the following requirements apply to bars 0.500 in. and over in least distance between parallel sides and to rods 0.500 in. and over in diameter:

Tensile strength, psi	68,000 min
Yield Strength at 0.2% Offset or at 0.0149 in. 2 in. Extension Under Load (E = 10,300,000), psi	56,000 min
Elongation, % in 2 in. or 4D	10 min

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

- 6.1.2 Tensile properties shall be as agreed upon by purchaser and vendor for rounds over 3.000 in. in diameter and for squares, rectangles, hexagons, and octagons over 3.000 in. in least distance between parallel sides.
- 6.2 Hardness: Material should have hardness not lower than Brinell 125 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 130 using 1000 kg load and 10 mm ball, but shall not be rejected on the basis of hardness if other technical requirements are met.
- 6.3 Conductivity:
- 6.3.1 If the conductivity is below 38% IACS (International Annealed Copper Standard), the material is considered unsatisfactory and must be reprocessed, regardless of property level.
- 6.3.2 If the conductivity is 40% IACS or higher and the tensile properties meet specified requirements, the material is considered to be satisfactory.
- 6.3.3 If the conductivity is 38 - 40% IACS, the tensile properties meet specified requirements, and the yield strength does not exceed the specified minimum by more than 11,900 psi, the material is considered to be satisfactory.
- 6.3.4 If the conductivity is below 40% IACS and the yield strength exceeds the specified minimum value of by 12,000 psi or more, the material is considered suspect.
- 6.3.5 When material is considered suspect, it may be reprocessed or a sample of the material may be heated for not less than 30 min. at $870\text{ F} \pm 10$ ($465.6\text{ C} \pm 5.6$) and quenched in cold water. Conductivity shall then be measured within 15 min. after quenching. If the difference between this measurement and the original measurement on the material is 6% or more, the material is satisfactory. If the difference is less than 6%, the material must be reprocessed.
- 6.4 Stress Corrosion Cracking Test: Material shall be capable of showing no evidence of stress corrosion cracking when subjected to the following test:
- 6.4.1 A suitable test specimen, cut from the material so that the axis of loading of the specimen is parallel to the short transverse direction of the material, shall be stressed to 75% of the yield strength value given in 6.1 and held at constant strain in a suitable fixture. The stressed specimen shall be subjected to cyclic immersion for 30 days in a 3-1/2% solution of sodium chloride conforming to the purity and pH requirements of the issue of ASTM B117 listed in the latest issue of AMS 2350, and maintained at room temperature; each cycle shall consist of 10 min. immersion in the solution and 50 min. out of the solution. Specimens shall be dried prior to each immersion.
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 all applicable requirements of the latest issue of AMS 2201.
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.