



AEROSPACE MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

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

AMS 4078 A

Superseding AMS 4078

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ALUMINUM ALLOY PLATE

5.6Zn - 2.5Mg - 1.6Cu - 0.30Cr (7075-T7351)

Stress-Relief Stretched

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **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.
3. **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	

4. **CONDITION:** Solution heat treated, stress-relieved by stretching, and precipitation heat treated to develop the required mechanical properties and resistance to stress corrosion cracking.
 - 4.1 Material shall be stretched in the solution heat treated condition to produce a nominal permanent set of 2%, but not less than 1-1/2% nor more than 3%.
 - 4.2 Material shall receive no further straightening operations after stretching.
5. **TECHNICAL REQUIREMENTS:** The product shall conform to the following requirements; tensile properties shall be determined in accordance with the latest issue of AMS 2355.

5.1 Tensile Properties:

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,300,000)		Elongation % in 2 in. or 4D min
		psi, min	in. in 2 in.	
0.250 to 1.000, incl	69,000	57,000	0.0151	7
Over 1.000 to 2.000, incl	69,000	57,000	0.0151	6
Over 2.000 to 2.500, incl	66,000	52,000	0.0141	6
Over 2.500 to 3.000, incl	64,000	49,000	0.0135	6

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

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- 5.1.2 Tensile properties of plate thicker than 3.000 in. shall be as agreed upon by purchaser and vendor.
- 5.2 Bending: Material 0.500 in. and under in thickness shall be capable of withstanding, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to 14 times the nominal thickness of the material, with axis of bend parallel to direction of rolling.
- 5.3 Conductivity:
- 5.3.1 If the conductivity is below 38% IACS (International Annealed Copper Standard), the material is considered unsatisfactory and must be reprocessed, regardless of property level.
- 5.3.2 If the conductivity is 40% IACS or higher and the tensile properties meet specified requirements, the material is considered to be satisfactory.
- 5.3.3 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.
- 5.3.4 If the conductivity is below 40% IACS and the yield strength exceeds the specified minimum value by 12,000 psi or more, the material is considered suspect.
- 5.3.5 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.
- 5.4 Stress Corrosion Cracking Test: Material shall be capable of showing no evidence of stress corrosion cracking when subjected to the following test:
- 5.4.1 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 5.1 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.
6. 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.
7. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2202.
8. REPORTS:
- 8.1 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, thickness, size, and quantity.
- 8.2 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.