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

AMS 4038

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Revised

ALUMINUM ALLOY PLATE
5.6Zn - 2.5Mg - 1.6Cu - 0.3Cr (7075-T651)
Stress-Relief Stretched

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

2. APPLICATION: Primarily intended for machined parts subject to excessive warpage during machining due to residual stresses, and for structural parts which will be painted or otherwise protected from corrosion.

3. COMPOSITION:

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

4. CONDITION: Solution heat treated, stress-relieved by stretching, and precipitation heat treated.

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:

5.1 Tensile Properties: Test specimens shall conform to ASTM E8-57T except from material less than 3/4 in. wide, and shall be cut across the direction of rolling except from material less than 9 in. wide. Elongation requirements apply only to material 3/4 in. and over in width.

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. min
		psi, min	Extension Under Load in. in 2 in.	
0.250 to 0.499, incl	77,000	66,000	0.0168	8
Over 0.499 to 1.000, incl	77,000	66,000	0.0168	6
Over 1.000 to 2.000, incl	77,000	66,000	0.0168	4
Over 2.000 to 2.500, incl	73,000	62,000	0.0160	3
Over 2.500 to 3.000, incl	70,000	60,000	0.0157	3

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

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 0.499 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.

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 the latest issue of AMS 2202 as applicable. Thickness tolerances shall conform to Table II.

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.

9. IDENTIFICATION:

9.1 Unless otherwise specified, each plate shall be marked, in the respective location indicated below, with the manufacturer's identification, the alloy number and temper, or AMS 4038, and nominal thickness in inches. The characters shall be not less than 3/8 in. in height, shall be applied using a suitable marking fluid, and shall not be obliterated by normal handling or heat treatment.

9.1.1 The alloy number and temper, or AMS 4038, shall be marked in rows of recurring characters from one edge to the opposite edge with rows spaced such that no piece larger than 12 in. square could be cut from the plate without bearing the alloy identification. The manufacturer's identification and thickness shall be marked in rows not more than 20 in. apart.

9.2 When required, bench marking for determining amount of stretch shall be as agreed upon by purchaser and vendor.