AERONAUTICAL MATERIAL SPECIFICATIONS

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

AMS 4039

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Revised

ALUMINUM ALLOY PLATE, ALCLAD
5.6Zn - 2.5Mg - 1.6Cu - 0.3Cr (Alclad 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 of good strength which are required to exhibit maximum corrosion resistance.

3. COMPOSITION:

Core		Cladding	
Zinc	5.1 - 6.1	Zinc	0.8 - 1.3
Magnesium	2.1 - 2.9	Silicon + Iron	0.7 max
Copper	1.2 - 2.0	Magnesium	0.10 max
Chromium	0.18 - 0.40	Copper	0.10 max
Iron	0.7 max	Manganese	0.10 max
Silicon	0.50 max	Other Impurities, each	0.05 max
Manganese	0.30 max	Other Impurities, total	0.15 max
Titanium	0.20 max	Aluminum	remainder
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 Cladding Thickness: After rolling, the average cladding thickness shall be as shown. Routine measurements are not required.

Total Thickness of Composite Product Inches	Cladding Thickness Per Side % of Total Thickness	
	min	max
0.250 to 0.499, incl	1.2	--
Over 0.499	1.2	3.0

5.2 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 (See 5.2.1)		Elongation % in 2 in. min
		psi, min	Extension Under Load in. in 2 in.	
0.250 to 0.499, incl	75,000	64,000	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

5.2.1 Extension under load is based upon the following values of E:

Nominal Thickness Inches	E
0.250 to 0.499, incl	10,000,000
Over 0.499	10,300,000

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

5.2.3 Tensile properties of plate thicker than 3.000 in. shall be as agreed upon by purchaser and vendor.

5.3 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 12 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.