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AERONAUTICAL MATERIAL SPECIFICATIONS

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

AMS 4051A

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ALUMINUM ALLOY SHEET AND PLATE, ALUMINUM ALLOY CLAD 6.8Zn - 2.75Mg - 2Cu - 0.3Cr (Alc X7178-0)

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 structural use, including machine tapered parts.
3. COMPOSITION:

Core		Cladding	
Zinc	6.3 - 7.3	Zinc	0.8 - 1.3
Magnesium	2.4 - 3.1	Silicon + Iron	0.7 max
Copper	1.6 - 2.4	Magnesium	0.10 max
Chromium	0.18 - 0.40	Copper	0.10 max
Iron	0.7 max	Manganese	0.10 max
Ø 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: Annealed.
5. TECHNICAL REQUIREMENTS:
 - 5.1 Cladding Thickness: After rolling, the cladding thickness on each side shall be not less than 3-1/4% of the total composite thickness.
 - 5.2 Tensile Properties: Test specimens shall conform to ASTM E8-54T 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.

Tensile Strength, psi	36,000 max
Elongation, % in 2 in.	10 min
 - 5.3 Properties After Heat Treatment: Material after proper solution and precipitation heat treatment shall conform to the following requirements.
 - 5.3.1 Tensile Properties: Test specimens shall conform to ASTM E8-54T 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.

Ø	Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (See 5.3.1.1)		Elongation % in 2 in. min.
			Extension Under Load		
			psi, min	in. in 2 in.	
	0.015 to 0.044, incl	76,000	66,000	0.0178	7
Over	0.044 to 0.499, incl	78,000	68,000	0.0182	8
Over	0.499 to 1.000, incl	84,000	73,000	0.0182	6

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

Nominal Thickness Inch	E
0.499 and under	9,600,000
Over 0.499	10,300,000

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

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: Unless otherwise specified, each sheet and plate shall be marked, in the respective location indicated below, with the manufacturer's identification and, in addition, the alloy name or number and temper, or AMS 4051, 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 Flat Sheet and Plate: The alloy name or number and temper, or AMS 4051, shall be marked in rows of recurring characters from one edge to the opposite edge with rows spaced such that no piece larger than 8 in. square could be cut from the sheet without bearing the alloy identification. The manufacturer's identification and thickness shall be marked in rows not more than 20 in. apart.