AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 4051

Issued 3-1-55
Revised

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 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
Silicon	0.7 max	Manganese	0.10 max
Iron	0.6 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:

5.1.1 Prior to Rolling: Aluminum alloy plates which are bonded to the alloy ingot or slab preparatory to rolling to the specified thickness of the material shall each have a thickness of not less than 4% of the total composite thickness.

5.1.2 Finished Product: After rolling, the cladding thickness shall be not less than 3-1/4% of the total composite thickness.

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

Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 9,600,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in. min
0.044 and under	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

Note 1. Tensile properties for material over 0.499 to 1.000, incl, are for core material, E = 10,300,000.

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects 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.