



AEROSPACE MATERIAL SPECIFICATIONS

AMS 4051B

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

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

Issued 3-1-55
Revised 3-15-66

ALUMINUM ALLOY SHEET AND PLATE, ALCLAD 6.8Zn - 2.75Mg - 2.0Cu - 0.30Cr (Alclad 7178-0)

- 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. Certain design and processing procedures may cause this material to be susceptible to stress corrosion cracking; ARP 823 recommends practices to minimize such conditions.
- 3. COMPOSITION:**

	Core (7178)		Cladding (7072)	
	min	max	min	max
Zinc	6.3	7.3	Zinc	0.8 - 1.3
Magnesium	2.4	3.1	Silicon + Iron	-- 0.7
Copper	1.6	2.4	Copper	-- 0.10
Chromium	0.18	0.40	Magnesium	-- 0.10
Iron	--	0.7	Manganese	-- 0.10
Silicon	--	0.50	Other Impurities, each	-- 0.05
Manganese	--	0.30	Other Impurities, total	-- 0.15
Titanium	--	0.20	Aluminum	remainder
Other Impurities, each	--	0.05		
Other Impurities, total	--	0.15		
Aluminum	remainder			

- 4. CONDITION:** Annealed.
- 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 Cladding Thickness:** After rolling, the average cladding thickness on each side shall be not less than ϕ 3-1/4% of the total composite thickness. Routine measurements are not required.
 - 5.2 Tensile Properties:**

ϕ	Nominal Thickness Inch	Tensile Strength psi, max	Yield Strength at 0.2% Offset or at Extension Indicated (See 5.3.1.1)		Elongation % in 2 in. or 4D, min
			psi, max	Extension Under Load in. in 2 in.	
	0.015 to 0.499, incl	36,000	20,000	0.0082	10
	0.500	40,000	--	--	10

- 5.2.1** When a dispute occurs between purchaser and vendor over the yield strength values, yield strength ϕ determined by the offset method shall apply.
 - 5.2.2** Tensile properties of material over 0.500 in. thick shall be as agreed upon by purchaser and vendor.

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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:**

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. or 4D, min
			psi, min	Extension Under Load 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
0.015 to 0.499, incl	9,600,000
Over 0.499 to 1.000, incl	10,300,000

5.3.1.2 When a dispute occurs between purchaser and vendor over the yield strength values, 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 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.

9. **IDENTIFICATION:** Unless otherwise specified, each sheet and plate shall be marked on one face, in the respective location indicated below. Symbols shall be applied using a suitable marking fluid and shall be sufficiently stable to withstand normal handling.