



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AMS 4051C

Superseding AMS 4051B

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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:**

Ø	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	- 0.35	Magnesium	-- 0.10
Iron	--	0.50	Manganese	-- 0.10
Silicon	--	0.40	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 shall be as shown. Routine measurements are not required.

Nominal Thickness Inches	Cladding Thickness Per Side % of Total Thickness	
	min	max
0.015 to 0.062, incl	3.2	--
Over 0.062 to 0.187, incl	2.0	--
Over 0.187 to 0.499, incl	1.2	--
Over 0.499	1.2	3.0

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5.2 Tensile Properties:

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 Tensile properties of material over 0.500 in. thick shall be as agreed upon by purchaser and vendor.

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

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:

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 and its revision letter, thickness, size, and quantity.