

AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 4021B

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

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ALUMINUM ALLOY SHEET AND PLATE, ALCLAD
1Mg - 0.6Si - 0.25Cu - 0.25Cr (Alc 6061-0)

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 formed structural parts which will be subsequently heat treated and which are required to exhibit maximum corrosion resistance and to approximate the color and appearance of other clad aluminum alloy parts.
3. COMPOSITION:

∅	Core		Cladding	
	Magnesium	0.8 - 1.2	Zinc	0.8 - 1.3
	Silicon	0.40 - 0.8	Silicon + Iron	0.7 max
	Copper	0.15 - 0.40	Magnesium	0.10 max
	Chromium	0.15 - 0.35	Copper	0.10 max
	Iron	0.7 max	Manganese	0.10 max
	Zinc	0.25 max	Other Impurities, each	0.05 max
	Manganese	0.15 max	Other Impurities, total	0.15 max
	Titanium	0.15 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 average cladding thickness shall be not less than 4% per side of the total composite thickness. Routine measurements are not required.
- 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.

∅	Nominal Thickness Inch	Tensile Strength psi, max	Yield Strength at 0.2% Offset max	Elongation % in 2 in., min
	0.010 to 0.020, incl	20,000	12,000	14
Over	0.020 to 0.128, incl	20,000	12,000	16
Over	0.128 to 0.499, incl	20,000	12,000	18

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no obligation to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the Board are responsible for protecting themselves against liability for infringement of patents."

5.3 Bending: Material shall be capable of withstanding, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to the ϕ bend factor times the nominal thickness of the material, with axis of bend parallel to direction of rolling.

Nominal Thickness Inch	Bend Factor
0.128 and under	1
Over 0.128 to 0.249, incl	2
Over 0.249 to 0.499, incl	4

5.4 Properties After Solution and Precipitation Heat Treatment: Material after proper solution and precipitation heat treatment shall conform to the following requirements.

5.4.1 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.

Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 9,900,000)		Elongation % in 2 in. min
		psi, min	Extension Under Load in. in 2 in.	
0.020 and under	38,000	32,000	0.0105	8
Over 0.020 to 0.499, incl	38,000	32,000	0.0105	10

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

5.4.2 Bending: Material shall be capable of withstanding, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to the bend factor times the nominal thickness of the material, with axis of bend parallel to direction of rolling.

Nominal Thickness Inch	Bend Factor
0.036 and under	3
Over 0.036 to 0.064, incl	4
Over 0.064 to 0.128, incl	5
Over 0.128 to 0.249, incl	6
Over 0.249 to 0.499, incl	10

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.