

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 4049 B

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ALUMINUM ALLOY SHEET AND PLATE, ALUMINUM ALLOY CLAD 5.6Zn - 2.5Mg - 1.6Cu - 0.25Cr (Alc. 7075-T6)

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	5.1 - 6.1	Zinc	0.8 - 1.3
Magnesium	2.1 - 2.9	Silicon + Iron	0.7 max
Copper	1.2 - 2.0	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:** Solution and precipitation heat treated.

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 for sheet having a finished thickness less than 0.188 in. and not less than 1.5% for sheet or plate having a finished thickness of 0.188 in. and over.

- 5.1.2 **Finished Product:** After rolling, the cladding thickness shall be not less than 3-1/4% of the total composite thickness for sheet less than 0.188 in. thick and not less than 1% nor more than 2% for sheet or plate 0.188 in. thick and over. Routine measurements are not required.

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 agreement to adhere to any SAE standard or recommended practice, and no commitment 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 report are responsible for protecting themselves against liability for infringement of patents."

- 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.

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated		Elongation % in 2 in. min
		<u>Extension Under Load</u>		
		psi, min	in. in 2 in.	
0.015 to 0.039, incl	70,000	60,000	0.0166	7
Over 0.039 to 0.499, incl	72,000	62,000	0.0171	8
Over 0.499 to 1.000, incl	77,000	66,000	0.0168	6
Over 1.000 to 2.000, incl	77,000	66,000	0.0168	4
Over 2.000 to 2.500, incl	73,000	62,000	0.0160	3
Over 2.500 to 3.000, incl	70,000	60,000	0.0157	3
Over 3.000	As agreed upon by purchaser and vendor.			

- 5.2.1 Extension under load is based on $E = 9,500,000$ for material 0.499 in. and under in thickness and on $E = 10,300,000$ for material over 0.499 in. thick.

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

- 5.3 **Bending:** Material 0.499 in. and under in thickness shall withstand, 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
0.020 and under	6
Over 0.020 to 0.063, incl	7
Over 0.063 to 0.091, incl	8
Over 0.091 to 0.125, incl	9
Over 0.125 to 0.249, incl	10
Over 0.249 to 0.499, incl	12

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.