

# AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.  
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## AMS 4022

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Revised

### ALUMINUM ALLOY SHEET, ALUMINUM ALLOY CLAD 1Mg - 0.6Si - 0.3Cu - 0.25Cr (Alc 61S-T4)

- 1. ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
- 2. APPLICATION:** Primarily for formed low strength structural parts which may be subsequently precipitation heat treated and which are required to exhibit maximum corrosion resistance and to match the color and appearance of other clad aluminum alloy parts.

#### 3. COMPOSITION:

Core		Cladding	
Magnesium	0.8 - 1.2	Zinc	0.75 - 1.25
Silicon	0.4 - 0.8	Silicon + Iron	0.70 max
Copper	0.15 - 0.40	Copper	0.10 max
Chromium	0.15 - 0.35	Manganese	0.10 max
Iron	0.70 max	Other Impurities, each	0.05 max
Zinc	0.20 max	Other Impurities, total	0.15 max
Manganese	0.15 max	Aluminum	remainder
Titanium	0.15 max		
Other Impurities, each	0.05 max		
Other Impurities, total	0.15 max		
Aluminum	remainder		

- 4. CONDITION:** Solution 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 composite sheet shall each have a thickness of not less than 4% of the total composite thickness for sheet having a finished thickness less than 0.064 in. and not less than 2.5% for sheet having a finished thickness of 0.064 in. and over.

- 5.1.2 Finished Product:** After rolling, the average cladding thickness shall be not less than 80% of the values specified above.

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

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Nominal Thickness, Inch	Tensile Strength, psi, min	Yield Strength at 0.2% Offset or at Extension Indicated		Elongation, % in 2 in., min
		psi, min	inch in 2 in.	
0.249 and under	27,000	14,000	0.0068	14

5.3 Bending: Sheet shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to three times the nominal thickness of the sheet, with axis of bend parallel to direction of rolling.

5.4 Properties After Precipitation Heat Treatment: Sheet after proper precipitation heat treatment shall conform to the following requirements.

5.4.1 Tensile Properties: Test specimens shall conform to ASTM E8 except from sheet less than 3/4 in. wide, and shall be cut parallel to the direction of rolling. 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		Elongation, % in 2 in., min
		psi, min	inch in 2 in.	
0.249 and under	38,000	32,000	0.0104	10

5.4.2 Bending: Sheet shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the bend factor times the nominal thickness of the sheet, with axis of bend parallel to direction of rolling.

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

6. QUALITY: Sheet shall be uniform in quality and condition, clean, sound, smooth, 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 sheet shall furnish with each shipment three copies of a report stating that the chemical composition and tensile properties of the sheet as received conform to requirements specified. This report shall include the purchase order number, material specification number, thickness, size, and quantity.