AERONAUTICAL MATERIAL SPECIFICATION

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AMS 4021A

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ALUMINUM ALLOY SHEET, ALUMINUM ALLOY CLAD
1Mg - 0.6Si - 0.3Cu - 0.25Cr (Alc 61S-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	0.75 - 1.25
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	0.20 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:

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.

5.1.2 Finished Product: After rolling, the cladding thickness shall be not less than 80% of the values specified above. Routine measurements are not required.

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, Inch	Tensile Strength, psi, max	Elongation, % in 2 in., min
0.020 and under	22,000	14
Over 0.020 - 0.128, incl	22,000	16
Over 0.128 - 0.249, incl	22,000	18

5.3 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
0.128 and under	1
Over 0.128 - 0.249, incl	2

5.4 Properties After Solution and Precipitation Heat Treatment: Sheet 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 except from sheet less than 3/4 in. wide, and shall be cut across the drection 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, 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 - 0.249, incl	38,000	32,000	0.0105	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