

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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Revised

ALUMINUM ALLOY SHEET AND STRIP Magnesium Silicon Copper (61S-T)

Page 1 of 3 pages

1. **ACKNOWLEDGMENT:** A vendor must mention this specification number in all quotations and when acknowledging purchase orders.

2. COMPOSITION:	Magnesium	0.8 - 1.2
	Silicon	0.4 - 0.8
	Copper	0.15 - 0.40
	Chromium	0.35 max
	Iron	0.70 max
	Manganese	0.15 max
	Titanium	0.15 max
	Zinc	0.10 max
	Other Impurities, each	0.05 max
	Other Impurities, total	0.15 max
	Aluminum	remainder

3. **CONDITION:** (a) Heat treated (quenched and aged) conforming to the following minimum physical properties when test specimens are cut across the direction of rolling, except from strips less than 9 inches wide which may be cut lengthwise:

Thickness inches	Tensile Strength lb per sq in.	Yield Strength at 0.2% Set or at Extension Indicated		Elongation % in 2 in.	Bend Factor
		lb per sq in.	Extension Under Load inch in 2"		
0.010 - 0.020	42,000	35,000	0.0110	8	2
0.021 - 0.036	42,000	35,000	0.0110	10	3
0.037 - 0.064	42,000	35,000	0.0110	10	4
0.065 - 0.128	42,000	35,000	0.0110	10	5
0.129 - 0.258	42,000	35,000	0.0110	10	6
0.259 - 0.500	42,000	35,000	0.0110	10	7

(b) The material shall not crack when cold bent 180° over a diameter equal to the bend factor times the thickness, the axis of the bend being parallel to the direction of rolling.

4. **QUALITY:** The material shall be uniform in quality and temper, commercially flat, clean, sound, smooth, and free from buckles, seams, cracks, laminations, blisters, and other injurious defects within the limits of best commercial manufacturing practices. Material revealing defects during fabrication is subject to rejection.

5. **TOLERANCES:** The following variations in standard thicknesses are permissible for the widths shown:

*Standard Thickness inches	Tolerance in % of nominal thickness (%T) or in inches, plus or minus					
	Widths up to 36" incl.	Widths over 36" to 42" incl.	Widths over 42" to 48" incl.	Widths over 48" to 54" incl.	Widths over 54" to 60" incl.	Widths over 60" to 66" incl.
0.249, 0.204)						
0.188, 0.156)	4%T	5%T	5%T	5%T	6%T	8%T
0.125, 0.102	0.0045	0.005	0.005	0.005	0.007	0.010
0.091, 0.081	0.003	0.004	0.004	0.005	0.006	0.008
0.064	0.003	0.004	0.004	0.005	0.006	0.006
0.051	0.003	0.004	0.004	0.005	0.006	0.006
0.040	0.0025	0.003	0.003	0.004	0.005	
0.032	0.002	0.0025	0.0025			
0.025, 0.020	0.002	0.0025				
0.018, 0.016	0.002					
**0.014	0.0015					
**0.012	0.0015					
**0.010	0.0015					

*Standard Thickness inches	Tolerance in % of nominal thickness (%T) or in inches, plus or minus					
	Widths over 66" to 72" incl.	Widths over 72" to 78" incl.	Widths over 78" to 84" incl.	Widths over 84" to 90" incl.	Widths over 90" to 96" incl.	Widths over 96" to 106" incl.
0.249, 0.204)						
0.188, 0.156)	10%	10%	11%	11%	12%	14%
0.125, 0.102	0.012	0.013	0.014	0.016	0.018	0.020
0.091, 0.081	0.010	0.010	0.011	0.012		
0.064	0.007	0.008	0.009			
0.051	0.007					

- * Intermediate thicknesses take the tolerance of the next heavier standard thickness.
 ** Tolerance applies up to maximum width of 28 inches in these thicknesses.

6. **REPORTS:** The manufacturer shall furnish three copies of a notarized report stating that the physical properties and chemical composition of this material are within the requirements specified. This report shall include the purchase order number, material specification number, size, quantity, and part number if parts are supplied.

7. **IDENTIFICATION:** (a) Unless otherwise specified, each plate or sheet shall be marked with the manufacturer's identification, and, in addition, the alloy name or number or the number of this specification, the thickness in inches and the temper. The characters shall be not less than 3/8 inch in height and shall be applied in rows of constantly recurring symbols from edge of the sheet to the opposite edge with the rows spaced approximately 5 inches apart. The characters shall be clearly legible and applied to the material by suitable means and suitable marking fluid, and shall not be obliterated by normal handling.

(b) Strip shall be marked on the outside end of the coil, and, when practicable, on the inside end also.