

AERONAUTICAL MATERIAL SPECIFICATION

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ALUMINUM ALLOY SHEET, ALUMINUM COVERED Copper Magnesium Manganese (ALC 24S-RT)

- 1. ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
- 2. COMPOSITION:** (a) The composition of the core and cladding materials shall conform to the following requirements

Aluminum Alloy Core

Copper	3.8 - 4.9
Magnesium	1.2 - 1.8
Manganese	0.3 - 0.9
Iron	0.50 max
Silicon	0.50 max
Chromium	0.25 max
Zinc	0.10 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

Aluminum Cladding

Iron + Silicon	0.70 max
Copper	0.10 max
Zinc	0.10 max
Manganese	0.05 max
Aluminum (by difference)	99.30 min

(b) When the analysis is made on a sample milled from the material representative of the entire cross section of the sheet, the percentage of the various elements as determined by analysis, except aluminum, shall be increased by 1% for thicknesses up to 0.064 and 5% for thicknesses 0.064 and up, and these figures shall be taken as the composition of the base metal.

- 3. CLADDING THICKNESS:** (a) **Prior to Rolling.**- Aluminum plates which are bonded to the alloy ingot or slab preparatory to rolling to the specified thickness of the sheet shall each have a thickness of not less than 5% of the total composite thickness for sheet having a finished thickness less than 0.064 inch and not less than 2.5% for sheet having a finished thickness of 0.064 inch and greater.

(b) **Finished Product.**- After rolling the average cladding thickness shall be not less than 80% of the values specified above.
- 4. CONDITION:** (a) Solution heat treated, cold worked, conforming to the following physical properties. Test specimens shall conform to ASTM E-8, except from sheet less than 3/4 inch wide, and shall be cut across the direction of rolling except from sheet less than 9 inches wide. Elongation requirements apply only to sheet 3/4 inch and over in width.

Thickness Inch	Tensile Strength psi min	Yield Strength (0.2% Offset) or at Extension Indicated		Elongation % in 2 in.	Bend Factor
		psi min	Extension Under Load inch in 2 in.		
0.020 - 0.031, incl.	62,000	48,000	0.0131	8	4
0.032 - 0.040, incl.	62,000	48,000	0.0131	9	4
0.041 - 0.063, incl.	62,000	48,000	0.0131	10	5
0.064 - 0.128, incl.	66,000	50,000	0.0134	10	6
0.129 - 0.188, incl.	66,000	50,000	0.0134	10	8

(b) Sheet shall withstand, without cracking, bending at room temperature through an angle of 180° around a diameter equal to the bend factor shown above times the nominal thickness of the sheet, with axis of bend parallel to direction of rolling.

5. **QUALITY:** (a) Sheet shall be uniform in quality and condition, clean, sound, and free from foreign material and from internal and external defects detrimental to fabrication or to the appearance and performance of parts. Sheet revealing defects during fabrication shall be subject to rejection.

(b) Sheet and parts made therefrom, shall be subjected to inspection by any method which will reveal defects.

6. **TOLERANCES:** Unless otherwise specified, tolerances shall conform to the latest revision of AMS 2202, as applicable. Thickness tolerances shall conform to Table II.

7. **REPORTS:** (a) Unless otherwise specified, the vendor of sheet shall furnish three copies of a notarized report stating that the sheet meets all the requirements of this specification. This report shall include the purchase order number, material specification number, size and quantity.

(b) Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a notarized report showing the purchase order number, material specification number, contractor or other direct supplier of sheet, part number, and quantity. When sheet for making parts is produced or purchased by the parts vendor, the vendor shall inspect each lot of sheet to determine conformance to the requirements of this specification, and shall include in the above report a certification that the sheet conforms, or shall include copies of the laboratory report showing the results of tests to determine conformance.

8. **IDENTIFICATION:** (a) Unless otherwise specified, each flat sheet shall be marked with the manufacturer's identification, and, in addition, the alloy name or number or AMS 4042, 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 such that no piece larger than 8 inches square could be cut from the sheet without bearing the alloy identification, or AMS 4042, and the temper. The manufacturer's identification and the thickness of the piece shall appear in rows not more than 20 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..