

AEROSPACE MATERIAL SPECIFICATIONS

AMS 4041G

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

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ALUMINUM ALLOY SHEET AND PLATE, ALCLAD
4.5Cu - 1.5Mg - 0.6Mn (Alclad 2024; -T3 Flat Sheet, -T4 Plate)

- 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 parts of good strength which are required to exhibit maximum corrosion resistance. Certain design and processing procedures may cause this material to be susceptible to stress corrosion cracking; ARP 823 recommends practices to minimize such conditions.

3. COMPOSITION:

	Core (2024)			Cladding (1230)	
	min	max		min	max
Copper	3.8	4.9	Iron + Silicon	--	0.7
Magnesium	1.2	1.8	Copper	--	0.10
Manganese	0.30	0.9	Zinc	--	0.10
Iron	--	0.50	Manganese	--	0.05
∅ Silicon	--	0.50	Other Impurities, each	--	0.05
Zinc	--	0.25	Aluminum, by difference	99.30	--
Chromium	--	0.10			
Other Impurities, each	--	0.05			
Other Impurities, total	--	0.15			
Aluminum	remainder				

4. CONDITION:

- 4.1 Sheet:** Solution heat treated and stretcher leveled.
- 4.2 Plate:** Solution heat treated.

- 5. TECHNICAL REQUIREMENTS:** When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

Section 8.3 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 requirement 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 reports are responsible for protecting themselves against liability for infringement of patents."

5.1 Cladding Thickness: After rolling, the average cladding thickness shall be as shown. Routine measurements are not required.

Total Thickness of Composite Product Inches	Cladding Thickness Per Side % of Total Thickness	
	min	max
0.008 to 0.062, incl	4.0	--
Over 0.062 to 0.187, incl	2.0	--
Over 0.187 to 0.499, incl	1.2	--
Over 0.499	1.2	3.0

5.2 Tensile Properties: Test specimens shall conform to ASTM E8 and shall be taken across the direction of rolling from widths 9 in. and over and parallel to the direction of rolling from widths less than 9 inches. Sheet type specimens shall be used for material less than 0.5 in. thick and 0.75 in. and over in width. Round specimens shall be used for material 0.5 in. and over in thickness and 0.75 in. and over in width. Material under 0.75 in. wide and under 0.5 in. thick may be tested in either full section or by use of round specimens; for such sizes, elongation requirements apply only when round specimens are used.

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (See 5.2.1)		Elongation % in 2 in. or 4D, min
		psi, min	Extension Under Load in. in 2 in.	
0.008 to 0.009, incl	58,000	39,000	0.0122	10
Over 0.009 to 0.020, incl	59,000	39,000	0.0122	12
Over 0.020 to 0.062, incl	59,000	39,000	0.0122	15
Over 0.062 to 0.187, incl	62,000	40,000	0.0120	15
Over 0.187 to 0.249, incl	63,000	41,000	0.0122	15
Over 0.249 to 0.499, incl	63,000	40,000	0.0120	12
Over 0.499 to 1.000, incl	62,000	41,000	0.0118	8
Over 1.000 to 1.500, incl	62,000	41,000	0.0118	7
Over 1.500 to 2.000, incl	61,000	41,000	0.0118	6
Over 2.000 to 3.000, incl	60,000	41,000	0.0118	4
Over 3.000 to 4.000, incl	56,000	40,000	0.0116	4

5.2.1 Extension under load is based upon the following values of E:

	Nominal Thickness Inches	E
∅	0.008 to 0.062, incl	9,500,000
	Over 0.062 to 0.499, incl	10,000,000
	Over 0.499	10,500,000

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 shall be capable of withstanding, 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
0.008 to 0.040, incl	4
Over 0.040 to 0.128, incl	5
Over 0.128 to 0.249, incl	8

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2202. Flatness tolerances for plate over 3.000 in. thick shall be as agreed upon by purchaser and vendor.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and technical requirements of this specification. This report shall include the purchase order number, material specification number, thickness, size, and quantity.

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