



AEROSPACE MATERIAL

AMS 4195

Society of Automotive Engineers, Inc. SPECIFICATION

TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 10001

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Revised

ALUMINUM ALLOY SHEET AND PLATE, ALCLAD

4.4Cu - 1.5Mg - 0.60Mn (Alclad 2024 and 1-1/2% Alclad 2024-T861 Flat Sheet;
1-1/2% Alclad 2024-T861 Plate)

- 1. ACKNOWLEDGMENT:** A vendor shall mention this specification number 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. This material, when re-heat treated by the user, may not have the tensile properties shown. 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:** Solution heat treated, cold reduced approximately 6% in thickness, and precipitation heat treated.
- 5. TECHNICAL REQUIREMENTS:** The product shall conform to the following requirements; tensile properties shall be determined in accordance with the latest issue of AMS 2355.
 - 5.1 Cladding Thickness:** After rolling, the average cladding thickness shall be as shown. Routine measurements are not required.

Total Thickness of Composite Product Inch	Cladding Thickness Per Side % of Total Thickness	
	min	max
0.020 to 0.062, incl	4.0	--
Over 0.062 to 0.187, incl	2.0	--
Over 0.187 to 0.500, excl	1.2	--
0.500	1.2	3.0

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5.2 Tensile Properties:

Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (See 6.2.1)		Elongation % in 2 in. or 4D, min
		psi, min	Extension Under Load in. in 2 in.	
0.020 to 0.062, incl	64,000	58,000	0.0162	3
Over 0.062 to 0.187, incl	69,000	64,000	0.0168	4
Over 0.187 to 0.249, incl	70,000	65,000	0.0170	4
Over 0.249 to 0.500, excl	69,000	63,000	0.0166	4
0.500	70,000	64,000	0.0162	4

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

Nominal Thickness Inch	E
0.020 to 0.062, incl	9,500,000
Over 0.062 to 0.500, excl	10,000,000
0.500	10,500,000

5.2.2 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength determined by the offset method shall apply.

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.

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.

9. IDENTIFICATION: Unless otherwise specified, each sheet and plate shall be marked on one face, in the respective location indicated below, with the alloy number and temper, AMS 4195 or applicable Federal or Military specification designation, inspection lot number, manufacturer's identification, and nominal thickness in inches. The alloy number shall be "Alclad 2024" for sheet 0.187 in. and under in thickness and "1-1/2% Alclad 2024" for sheet and plate over 0.187 in. thick. An inspection lot shall be material of the same alloy, temper, section, and size traceable to a heat treatment lot or lots and subjected to inspection at one time. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling.

9.1 Flat Sheet and Plate Under 6 In. Wide: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 feet. The inspection lot number may appear in the row marking or may appear at only one location on the piece.