ADOPTION NOTICE

SAE–AMS 4270, "Aluminum Alloy, Alclad Sheet 4.1Cu – 1.4Mg – 0.45Mn Alclad 2424–T3 Flat Sheet Solution Heat Treated and Cold Worked" was adopted on 22 May 1995 for use by the Department of Defense (DoD). Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: Air Force, ASC/ENSI, Building 125, 2335 Seventh Street, Suite 6, Wright–Patterson AFB OH 45433–7809. DoD activities may obtain copies of this standard from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111–5094. The private sector and other Government agencies may purchase copies from the Society of Automotive Engineers Inc., 400 Commonwealth Drive, Warrendale, PA 15096–0001.

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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4270

Issued MAY 1995

Submitted for recognition as an American National Standard

ALUMINUM ALLOY, ALCLAD SHEET
4.1Cu - 1.4Mg - 0.45Mn
Alclad 2424-T3 Flat Sheet
Solution Heat Treated and Cold Worked

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of sheet clad on both sides with a different aluminum alloy.

1.2 Application:

This sheet has been used typically for components requiring good strength, corrosion resistance, high toughness, and resistance to fatigue crack growth, but usage is not limited to such applications.

1.2.1 Certain design and processing procedures may cause this sheet to become susceptible to stress-corrosion cracking; ARP823 recommends practices to minimize such conditions.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other documents shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2202	Tolerances, Aluminum Alloy and Magnesium Alloy Sheet and Plate
MAM 2202	Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Sheet and Plate
AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings

2.1 (Continued)

MAM 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units

AMS 2811 Identification, Aluminum and Magnesium Alloy Wrought Products

ARP823 Minimizing Stress-Corrosion Cracking in Wrought Heat-Treatable Aluminum Alloy Products

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 646 Fracture Toughness Testing of Aluminum Alloys
ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products
ASTM E 561 R-Curve Determination

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Tables 1 and 2, determined in accordance with AMS 2355 or MAM 2355.

TABLE 1 - Composition, Core (2424)

Element	min	max
Copper	3.8	4.4
Magnesium	1.2	1.6
Manganese	0.30	0.6
Zinc	--	0.20
Iron	--	0.12
Silicon	--	0.10
Titanium	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

TABLE 2 - Composition, Cladding (1050)

Element	min	max
Iron	--	0.40
Silicon	--	0.25
Copper	--	0.05
Zinc	--	0.05
Manganese	--	0.05
Magnesium	--	0.05
Vanadium	--	0.05
Titanium	--	0.03
Other Impurities, each	--	0.03
Aluminum, by difference	99.50	--

3.2 Condition:

Solution heat treated in accordance with MIL-H-6088 and cold worked.

3.3 Properties:

Sheet shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 Tensile Properties: Shall be as specified in Table 3.

TABLE 3A - Minimum Tensile Properties, Inch/Pound Units

Nominal Thickness Inch	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
Over 0.020 to 0.062, incl	59.0	39.0	15
Over 0.062 to 0.128, incl	61.0	40.0	15
Over 0.128 to 0.249, incl	62.0	40.0	15

TABLE 3B - Minimum Tensile Properties, SI Units

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Over 0.51 to 1.57, incl	407	269	15
Over 1.57 to 3.25, incl	421	276	15
Over 3.25 to 6.32, incl	427	276	15

3.3.2 Critical-Stress-Intensity Factor (K_c): Shall be not lower than the values shown in Table 4, determined in the T/L direction in accordance with ASTM B 646 and ASTM E 561 or by other method acceptable to purchaser.

TABLE 4 - Critical-Stress-Intensity Factor

Nominal Thickness Inch	Nominal Thickness Millimeters	K_c min ksi $\sqrt{in}$	K_c min MPa $\sqrt{m}$
0.020 to 0.125, incl	0.51 to 3.18, incl	130	143
Over 0.125 to 0.249, incl	3.18 to 6.32, incl	140	154

3.3.3 Bending: Sheet shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the bend factor shown in Table 5 times the nominal thickness of the sheet with axis of bend parallel to the direction of rolling.

TABLE 5 - Bending Parameters

Nominal Thickness Inch	Nominal Thickness Millimeters	Bend Factor
0.020 to 0.040, incl	0.51 to 1.02, incl	4
Over 0.040 to 0.128, incl	Over 1.02 to 3.25, incl	5
Over 0.128 to 0.249, incl	Over 3.25 to 6.32, incl	8

3.3.4 Cladding Thickness: After rolling, the average cladding thickness shall be as specified in Table 6.

TABLE 6 - Average Cladding Thickness

Nominal Thickness Inch	Nominal Thickness Millimeters	Cladding Thickness Per Side % of Thickness min
0.020 to 0.062, incl	0.51 to 1.57, incl	4.0
Over 0.062 to 0.187, incl	Over 1.57 to 4.75, incl	2.0
Over 0.187 to 0.249, incl	Over 4.75 to 6.32, incl	1.2

3.4 Quality:

Sheet, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the sheet.