

AEROSPACE MATERIAL SPECIFICATION

SAE AMS4270

REV. B

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Superseding AMS4270A

Aluminum Alloy, Alclad Flat Sheet
4.1Cu - 1.4Mg - 0.45Mn (Alclad 2424-T3)
Solution Heat Treated and Cold Worked

UNS A82424

RATIONALE

AMS4270B has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of March 2007. It is recommended, therefore, that this specification not be specified for new designs.

"NONCURRENT" refers to those specifications which have previously been widely used and which may be required for production or processing of existing designs in the future. The Aerospace Materials Division, however, does not recommend these specifications for future use in new designs. "NONCURRENT" specifications are available from SAE upon request.

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SAE WEB ADDRESS:

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 publications 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 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
- 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

2.1 (Continued):

AMS 2772 Heat Treatment of Aluminum Alloy Raw Materials

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

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 646 Fracture Toughness Testing of Aluminum Alloys
ASTM B 666/B 666M Identification Marking of Aluminum Products
ASTM E 561 R-Curve Determination

2.3 ANSI Publications:

Available from American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036-8002.

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products
ANSI H35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

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 to the T3 temper in accordance with AMS 2772 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 shown in Table 3 for sheet over 0.062 to 0.128, (1.57 to 3.25 mm) inclusive, in nominal thickness.

TABLE 3 - Minimum Tensile Properties

Tensile Strength	61.0 ksi (421 MPa)
Yield Strength at 0.2% Offset	40.0 ksi (276 MPa)
Elongation in 2 Inches (50.8 mm) or 4D	15%

- 3.3.2 Critical-Stress-Intensity Factor (K_{IC}): 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_{IC} min ksi $\sqrt{\text{inch}}$	K_{IC} min MPa $\sqrt{\text{m}}$
0.062 to 0.128, incl	1.57 to 3.25, incl	130	143

- 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
0.062 to 0.128, incl	1.57 to 3.25, incl	5

- 3.3.4 Average 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	Average Cladding Thickness Per Side % of Thickness Minimum
Over 0.062 to 0.128, incl	Over 1.57 to 3.25, incl	2.0

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.