SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4274

Issued JAN 1998

Submitted for recognition as an American National Standard

Aluminum Alloy, Alclad Sheet
4.4Cu - 1.5Mg - 0.60Mn (Alclad 2024-0)
Annealed, Fine Grain

UNS A82024

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of sheet.

1.2 Application:

This sheet has been used typically for severely formed structural parts which will be subsequently heat treated and painted or otherwise protected from corrosion, but usage is not limited to such applications.

1.2.1 Certain design and processing procedures may cause these products to become susceptible to stress-corrosion cracking after heat treatment; 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

QUESTIONS REGARDING THIS DOCUMENT: (412) 772-7154 FAX: (412) 776-0243
TO PLACE A DOCUMENT ORDER: (412) 776-4970 FAX: (412) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.1 (Continued):

AMS 2772 Heat Treatment of Aluminum Alloy Wrought 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 666/B 666M Identification Marking of Aluminum Products

ASTM E 112 Determining the Average Grain Size

2.3 ANSI Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI H 35.2 Dimensional Tolerances for Aluminum Mill Products
ANSI H 35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

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

TABLE 1 - Composition, Core (2024)

Element	min	max
Copper	3.8	4.9
Magnesium	1.2	1.8
Manganese	0.30	0.9
Iron	--	0.50
Silicon	--	0.50
Zinc	--	0.25
Titanium	--	0.15
Chromium	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

TABLE 2 - Composition, Cladding (1230)

Element	min	max
Iron + Silicon	--	0.70
Copper	--	0.10
Zinc	--	0.10
Manganese	--	0.05
Magnesium	--	0.05
Vanadium	--	0.05
Titanium	--	0.03
Other Impurities, each	--	0.03
Aluminum, by difference	99.30	--

3.2 Condition:

Annealed in accordance with AMS 2772 to 0 Temper.

3.3 Properties:

The sheet shall conform to the following requirements determined in accordance with AMS 2355 or MAM 2355:

3.3.1 As Annealed:

3.3.1.1 Average Grain Size: Shall be ASTM No. 6 or finer, determined in accordance with ASTM E 112.

3.3.1.2 Tensile Properties: Shall be as shown in Table 3.

TABLE 3A - Tensile Properties, Inch/Pound Units

Nominal Thickness Inch	Tensile Strength ksi, max	Yield Strength at 0.2% Offset ksi, max	Elongation in 2 Inches or 4D %, min
Over 0.009 to 0.062, incl	30.0	14.0	12
Over 0.062 to 0.126, incl	32.0	14.0	12

TABLE 3B - Tensile Properties, SI Units

Nominal Thickness Millimeters	Tensile Strength MPa, max	Yield Strength at 0.2% Offset MPa, max	Elongation in 50.8 mm or 4D %, min
Over 0.23 to 1.57, incl	207	96.5	12
Over 1.57 to 3.20, incl	221	96.5	12

3.3.1.3 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 4 times the nominal thickness of the sheet with axis of bend parallel to the direction of rolling.

TABLE 4 - Bending Parameters

Nominal Thickness Inch	Nominal Thickness Millimeters	Bend Factor
Over 0.009 to 0.062, incl	Over 0.23 to 1.57, incl	0
Over 0.062 to 0.126, incl	Over 1.57 to 3.20, incl	1

3.3.2 Response to Heat Treatment: Sheet shall have the following properties after being solution heat treated in accordance with AMS 2772 and aging for not less than 96 hours at room temperature to the T42 temper.

3.3.2.1 Tensile Properties: Shall be as shown in Table 5.

TABLE 5A - 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 0.009 to 0.020, incl	58.0	36.0	15
Over 0.020 to 0.062, incl	58.0	36.0	16
Over 0.062 to 0.126, incl	61.0	38.0	16

TABLE 5B - 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 0.23 to 0.51, incl	400	248	15
Over 0.51 to 1.57, incl	400	248	16
Over 1.57 to 3.20, incl	421	262	16

3.3.2.2 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 6 times the nominal thickness of the sheet with axis of bend parallel to the direction of rolling.

TABLE 6 - Bending Parameters

Nominal Thickness Inch	Nominal Thickness Millimeters	Bend Factor
Over 0.009 to 0.040, incl	Over 0.23 to 1.02, incl	4
Over 0.040 to 0.126, incl	Over 1.02 to 3.20, incl	5

3.3.3 Cladding Thickness: After rolling, the average cladding thickness shall conform to the requirements in Table 7.

TABLE 7 - Minimum Average Cladding Thickness

Nominal Thickness Inch	Nominal Thickness Millimeters	Cladding Thickness Per Side % of Total Thickness
Over 0.009 to 0.062, incl	Over 0.23 to 1.57, incl	4.0
Over 0.062 to 0.126, incl	Over 1.57 to 3.20, 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.