AEROSPACE MATERIAL SPECIFICATION

AMS4274	REV. A

Issued 1998-01
Revised 2008-01
Reaffirmed 2013-09

Superseding AMS4274

Aluminum Alloy, Alclad Sheet
4.4Cu - 1.5Mg - 0.60Mn (Alclad 2024-0)
Annealed, Fine Grain
(Composition similar to UNS A82024)

RATIONALE

AMS4274A has been reaffirmed to comply with the SAE five-year review policy.

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 issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged or Flash Welded Rings
AMS 2772	Heat Treatment of Aluminum Alloy Wrought Materials
ARP823	Minimizing Stress-Corrosion Cracking in Wrought Heat Treatable Aluminum Alloy Products
AS 1990	Aluminum Alloy Tempers

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS4274A

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B 666/B 666M Identification Marking of Aluminum and Magnesium Products
ASTM E 112 Determining Average Grain Size

2.3 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036, Tel: 212-642-4900, www.ansi.org.

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.

TABLE 1 - COMPOSITION, CORE (2024)

Element	min	max
Silicon	--	0.50
Iron	--	0.50
Copper	3.8	4.9
Manganese	0.30	0.90
Magnesium	1.2	1.8
Chromium	--	0.10
Zinc	--	0.25
Titanium	--	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

TABLE 2 - COMPOSITION, CLADDING (1230)

Element	min	max
Iron + Silicon	--	0.70
Copper	--	0.10
Manganese	--	0.05
Magnesium	--	0.05
Zinc	--	0.10
Vanadium	--	0.05
Titanium	--	0.03
Other Elements, 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:

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 (per AS 1990).

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.

3.5 Tolerances

Shall conform to all applicable requirements of ANSI H35.2 or ANSI H35.2M.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of sheet shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the sheet conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), average grain size (3.3.1.1), tensile properties as annealed (3.3.1.2), and after solution heat treatment and aging (3.3.2.1), and tolerances (3.5) are acceptance tests and, except for composition and grain size determination, shall be performed on each lot.