



AEROSPACE MATERIAL SPECIFICATION

AMS4278

REV. B

Issued 1997-12
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Reaffirmed 2013-12

Superseding AMS4278A

Aluminum Alloy, Alclad Sheet
5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075-0)
Annealed, Fine Grained
(Composition similar to UNS A87075)

RATIONALE

AMS4278B 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 alclad sheet with a fine-grain core of ASTM No. 6 or finer.

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 this sheet 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 supplied 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.

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SAE WEB ADDRESS:

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or 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 Raw Materials

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

AS1990 Aluminum Alloy Tempers

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or
www.astm.org.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products
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 ANSI, 25 West 43rd Street, New York, NY 10036 or www.ansi.org.

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.

TABLE 1 - Composition, Core (7075)

Element	min	max
Silicon	--	0.40
Iron	--	0.50
Copper	1.2	2.0
Manganese	--	0.30
Magnesium	2.1	2.9
Chromium	0.18	0.28
Zinc	5.1	6.1
Titanium	--	0.20
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

TABLE 2 - Composition, Cladding (7072)

Element	min	max
Silicon + Iron	--	0.7
Copper	--	0.10
Manganese	--	0.10
Magnesium	--	0.10
Zinc	0.8	1.3
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Annealed in accordance with AMS 2772.

3.3 Properties:

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 of Core: Shall be ASTM No. 6 or finer, determined in accordance with ASTM E 112 or by a technique agreed upon by purchaser and vendor.

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, maximum	Elongation in 2 Inches or 4D %, minimum
Over 0.039 to 0.062, incl	36.0	20.0	10
Over 0.062 to 0.126, incl	38.0	20.0	10

TABLE 3B - Tensile Properties, SI Units

Nominal Thickness Millimeters	Tensile Strength MPa, max	Yield Strength at 0.2% Offset MPa, maximum	Elongation in 50.8 mm or 4D %, minimum
Over 0.99 to 1.57, incl	248	138	10
Over 1.57 to 3.20, incl	262	138	10

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
0.008 to 0.062, incl	0.20 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 and precipitation heat treated to the -T62 temper (See AS1990) in accordance with AMS 2772.

3.3.2.1 Tensile Properties: Shall be as specified 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 0.039 to 0.062, incl	72.0	62.0	9
Over 0.062 to 0.126, incl	74.0	64.0	9

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 0.99 to 1.57, incl	496	427	9
Over 1.57 to 3.20, incl	510	441	9

- 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
0.008 to 0.020, incl	0.20 to 0.51, incl	6
Over 0.020 to 0.062, incl	Over 0.51 to 1.57, incl	7
Over 0.062 to 0.091, incl	Over 1.57 to 2.31, incl	8
Over 0.091 to 0.126, incl	Over 2.31 to 3.20, incl	9

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

TABLE 7 - Average Cladding Thickness

Nominal Thickness Inch	Nominal Thickness Millimeters	Average Cladding Thickness Per Side % of Total Thickness minimum
0.008 to 0.062, incl	0.20 to 1.57, incl	3.2
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.