AEROSPACE MATERIAL SPECIFICATION

AMS4100™	REV. G
Issued 1979-07 Revised 2024-01 Superseding AMS4100F	

Aluminum Alloy, Alclad, Sheet
5.7Zn - 2.2Mg - 1.6Cu - 0.22Cr (Alclad 7475-T761)
Solution and Precipitation Heat Treated
(Composition similar to UNS A87475)

RATIONALE

AMS4100G results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (see 3.3.6, 3.6, 4.4.1, 5.1.1, and 8.4), relocate Definitions (see 2.4), update Applicable Documents (see Section 2 and 3.2) and Corrosion Resistance Indicator Test criteria (see 3.3.3.2 and 3.3.3.3), and restrict the use of the immediate prior specification revision (see 8.3).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of alclad sheet 0.040 to 0.249 inch (1.02 to 6.32 mm), inclusive, in nominal thickness (see 8.5).

1.2 Application

This sheet has been used typically for structural applications requiring material with high strength and resistance to exfoliation-corrosion, moderate fatigue strength, and high fracture toughness, but usage is not limited to such applications.

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 +1 724-776-4970 (outside USA), www.sae.org.

AMS2355	Quality Assurance, Sampling and Testing, Aluminum Alloys and Magnesium Alloy, Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings
AMS2772	Heat Treatment of Aluminum Alloy Raw Materials
AS7766	Terms Used in Aerospace Metals Specifications

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**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4100G

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 B646 Fracture Toughness Testing of Aluminum Alloys

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

ASTM E561 KR Curve Determination

ASTM G34 Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)

2.3 ANSI Accredited Publications

Copies of these documents are available online at https://webstore.ansi.org/.

ANSI H35.1/H35.1M Standard Alloy and Temper Designation System for Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

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

2.4 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS2355.

Table 1A - Composition, core (7475)

Element	Min	Max
Silicon	--	0.10
Iron	--	0.12
Copper	1.2	1.9
Manganese	--	0.06
Magnesium	1.9	2.6
Chromium	0.18	0.25
Zinc	5.2	6.2
Titanium	--	0.06
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

Table 1B - 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

Solution and precipitation heat treated in accordance with AMS2772 to the T761 temper (refer to ANSI H35.1/H35.1M).

3.3 Properties

Sheet shall conform to the following requirements, determined in accordance with AMS2355 on the mill produced product:

3.3.1 Long Transverse Tensile Properties

Shall be as shown in Table 2.

Table 2A - Minimum tensile properties, inch/pound units

Nominal Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D
0.040 to 0.062, incl	66.0	55.0	9
Over 0.062 to 0.187, incl	68.0	57.0	9
Over 0.187 to 0.249, incl	70.0	60.0	9

Table 2B - Minimum tensile properties, SI units

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm
1.02 to 1.57, incl	455	379	9
Over 1.57 to 4.75, incl	469	393	9
Over 4.75 to 6.32, incl	483	414	9

3.3.2 Fracture Toughness

Plane-stress fracture toughness, K_C, shall be tested in accordance with ASTM E561 and ASTM B646 using recommended 16-inch (406-mm) wide specimens of full sheet thickness. Plane-stress fracture toughness, K_C, meeting the requirements of ASTM B646, shall meet or exceed the values specified in Table 3.

Table 3 - Minimum fracture toughness properties

Nominal Thickness Inches	Nominal Thickness Millimeters	Specimen Orientation	K_C ksi $\sqrt{in}$	K_C MPa $\sqrt{m}$
0.040 to 0.125, incl	1.02 to 3.18, incl	T-L	87.0	95.6
0.040 to 0.125, incl	1.02 to 3.18, incl	L-T	100.0	110.0
Over 0.125 to 0.249, incl	Over 3.18 to 6.32, incl	T-L	80.0	87.9

3.3.3 Corrosion Resistance Indicator Test

The cladding shall be removed from the test surface.

3.3.3.1 If the electrical conductivity is 39.0% IACS (International Annealed Copper Standard) (22.6 MS/m) or higher and the yield strength does not exceed the specified minimum (see 3.3.1) by 9.0 ksi (62 MPa) or more, the sheet is acceptable.

3.3.3.2 If the yield strength exceeds the specified minimum (see 3.3.1) by 9.0 ksi (62 MPa) or more, sheet is not acceptable.

3.3.3.3 If the electrical conductivity is lower than 39.0% IACS (22.0 MS/m), sheet is not acceptable.

3.3.3.4 Sheet that is not acceptable according to the requirements of 3.3.3.2 or 3.3.3.3 may be given additional precipitation heat treatment and retested. After such treatment, if all specified properties are met, the sheet is acceptable.

3.3.4 Exfoliation Corrosion Resistance

The cladding shall be removed from the test surface. For sheet 0.100 inch (2.54 mm) or thicker, 10% of the thickness shall be removed by machining one surface. The cladding present on the surface opposite the test surface shall also be removed or masked off.

3.3.4.1 Sheet shall not exhibit exfoliation corrosion at test plane greater than EB as illustrated by Figure 2, of ASTM G34.

3.3.5 Cladding Thickness Per Side

Shall be as shown in Table 4.

Table 4 - Average cladding thickness

Nominal Sheet Thickness Inches	Nominal Sheet Thickness Millimeters	Average Cladding Thickness % of Sheet Thickness Nominal	Average Cladding Thickness % of Sheet Thickness Minimum Average
Up to 0.062, incl	Up to 1.57, incl	4.0	3.2
Over 0.062 to 0.187, incl	Over 1.57 to 4.75, incl	2.5	2.0
Over 0.187 to 0.249, incl	Over 4.75 to 6.32, incl	1.5	1.2

3.3.6 Mechanical property and cladding thickness requirements for product outside the range covered by Tables 2, 3, and 4 shall be agreed upon between the purchaser and producer and reported in 4.4.1 (see 8.5).

3.4 Quality

Sheet, as received by the 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.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

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