AEROSPACE MATERIAL SPECIFICATION

AMS4327™	REV. B

Issued 2003-12
Reaffirmed 2009-06
Revised 2022-06

Superseding AMS4327A

Aluminum Alloy, Plate (2098-O)
3.5Cu - 1.1Li - 0.50Mg - 0.40Ag - 0.11Zr
Annealed

(Composition similar to UNS A92098)

RATIONALE

AMS4327B results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (3.3.1, 3.6, 4.4.1, 5.1.1, 8.7), update applicable documents (Section 2, 8.5), column headings (Table 2), and ordering information (8.8), and allow the use of the immediate prior specification revision (8.6).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of plate 0.250 to 0.300 inch (6.35 to 7.62 mm), inclusive, in thickness (see 8.8).

1.2 Application

This product has typically been used in aerospace applications where low density is needed in combination with high strength, high toughness, high damage tolerance, and improved stiffness, 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 Alloys, 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/AMS4327B/

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 B594 Ultrasonic Inspection of Aluminum-Alloy Wrought Products

ASTM B646 Fracture Toughness Testing of Aluminum Alloys

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B66M Identification Marking of Aluminum Products

ASTM E561 K-R Curve Determination

ASTM G47 Determining Susceptibility to Stress-Corrosion Cracking of High-Strength Aluminum Alloy Products

2.3 ANSI Accredited Publications

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

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

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 Table 1, determined in accordance with AMS2355.

Table 1 - Composition

Element	Min	Max
Silicon	--	0.12
Iron	--	0.15
Copper	3.2	3.8
Manganese	--	0.35
Magnesium	0.25	0.8
Zinc	--	0.35
Titanium	--	0.10
Silver	0.25	0.6
Lithium	0.8	1.3
Zirconium	0.04	0.18
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

3.2.1 -O Condition (refer to ANSI H35.1/H35.1M)

Annealed by heating, holding at heat for a time commensurate with section thickness and slow cooling (see 8.2). Product may receive minor stretching to improve flatness.

3.2.2 -T82P Temper

Solution heat treated in accordance with AMS2772, stretched to produce a permanent set of at least 1.5% but not more than 4.0%, and precipitation heat treated to -T82P temper in accordance with AMS2772 (see 8.3).

3.3 Properties

Plate shall conform to the following requirements, determined on the mill produced size, in accordance with AMS2355 and as specified herein.

3.3.1 Mechanical property requirements for product outside of the range covered by 1.1 shall be agreed upon between purchaser and producer and reported in 4.4.1.

3.3.2 As Received (-O Temper)

The material shall meet the O temper requirements shown in Table 2 in the as-supplied condition.

3.3.3 Response to Heat Treat (-T82P)

The material shall also be capable of meeting the -T82P property requirements shown in Tables 2 and 3 after proper solution heat treatment, stretching, and artificial aging per 3.2.2.

3.3.3.1 Tensile Properties

Shall be as specified in Table 2.

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

Temper	Nominal Thickness Inches	Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
O	0.250 to 0.300, incl	LT	35 max	25 max	11
T82P	0.250 to 0.300, incl	L	73.0	68.0	6
		LT	73.0	68.0	6

Table 2B - Minimum tensile properties, SI units

Temper	Nominal Thickness Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
O	6.35 to 7.62, incl	LT	241 max	172 max	11
T82P	6.35 to 7.62, incl	L	503	476	6
		LT	503	476	6

3.3.3.2 Stress-Corrosion Resistance

Demonstration of capability on mill produced plate in the -T82P temper (see 4.3.1), tested in accordance with ASTM G47, shall show no evidence of stress corrosion failure when stressed in the long-transverse direction at 35.0 ksi (241 MPa) and exposed for 30 days.

3.3.3.3 Fracture Toughness

Demonstration of capability on mill produced plate in the -T82P temper (see 4.3.1), tested in accordance with ASTM E561 and ASTM B646, shall meet the requirements for K_c specified in Table 3. The specimen type shall be M(T) and have a width of 16 inches. The specimen shall be fatigue pre-cracked in accordance with ASTM E561. The initial crack length (i.e., machine notch plus fatigue pre-crack) shall have a total initial crack length ($2a_0$) of 4 inches.

Table 3A - Minimum fracture toughness, inch/pound units

Temper	Thickness, Inclusive (Inches)	Specimen Orientation	Required Minimum Plane Strain Fracture Toughness, K_c (ksi-in $^{1/2}$)
T82P	0.250 to 0.300	L-T	120
		T-L	80

Table 3B - Minimum fracture toughness, SI units

Temper	Thickness, Inclusive (mm)	Specimen Orientation	Required Minimum Plane Strain Fracture Toughness, K_c (MPa-m $^{1/2}$)
T82P	6.35 to 7.62	L-T	132
		T-L	88

3.4 Quality

Plate, 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 plate. Light scratches and discoloration or streaking shall not be reason for rejection.

3.4.1 Plate shall be ultrasonically inspected at an intermediate gauge of at least 2 inches in accordance with ASTM B594 and shall meet the requirements of Class B.

3.5 Tolerances

Shall conform to all applicable requirements of ANSI H35.2 or 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 plate shall supply all samples for producer'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 plate conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), tensile properties (3.3.3.1), fracture toughness (3.3.3.3), and ultrasonic inspection (3.4.1) are acceptance tests, and except for composition shall be performed on each lot.