



AEROSPACE MATERIAL SPECIFICATION	AMS4329™	REV. C
	Issued 2003-07 Reaffirmed 2011-11 Revised 2025-03 Superseding AMS4329B	
Aluminum Alloy, Plate (7085-T7651) 7.5Zn - 1.6Cu - 1.5Mg - 0.12Zr Solution Heat Treated, Stress-Relieved, and Overaged (Composition similar to UNS A97085)		

RATIONALE

AMS4329C results from a Five-Year Review and update of this specification with changes to update wording to prohibit unauthorized exceptions (see 3.3.7, 3.6, and 8.3), correct reference metric value (see 3.3.5), update Applicable Documents (see Section 2) and Acceptance Tests (see 4.2.1), and allow the use of the immediate prior specification revision (see 8.4).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of plate 4.001 to 7.000 inches (101.62 to 177.80 mm), inclusive, in nominal thickness (see 8.5).

1.2 Application

This product has been used in aerospace applications requiring a high level of mechanical properties and fracture toughness, moderate resistance to stress-corrosion cracking, and resistance to exfoliation corrosion, 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.

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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

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 B645 Linear-Elastic Plane-Strain 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 E399 Linear-Elastic Plane-Strain Fracture Toughness Testing of Metallic Materials

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

ASTM G47 Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products

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 1 - Composition

Element	Min	Max
Silicon	--	0.06
Iron	--	0.08
Copper	1.3	2.0
Manganese	--	0.04
Magnesium	1.2	1.8
Chromium	--	0.04
Zinc	7.0	8.0
Titanium	--	0.06
Zirconium	0.08	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

Heat treatment shall be in accordance with AMS2772 to the -T7651 temper (refer to ANSI H35.1/H35.1M) and as follows:

Solution heat-treatment and artificial aging practices are proprietary. Material shall be stretched not less than 1-1/2% nor more than 3% prior to artificial aging.

3.3 Properties

Product shall conform to the following requirements, determined in accordance with AMS2355.

3.3.1 Tensile properties shall be as shown in Table 2.

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

Nominal Thickness Inches	Grain Direction	Tensile	Yield Strength	Elongation in
		Strength ksi	at 0.2% Offset ksi	2 Inches or 4D %
4.001 to 5.000	L	75.0	72.0	9
	LT	76.0	69.0	7
	ST	74.0	65.0	3
5.001 to 6.000	L	75.0	72.0	8
	LT	76.0	69.0	7
	ST	73.0	65.0	3
6.001 to 7.000	L	74.0	71.0	8
	LT	75.0	67.0	5
	ST	72.0	64.0	3

Table 2B - Minimum tensile properties, SI units

Nominal Thickness Millimeters	Grain Direction	Tensile	Yield Strength	Elongation in
		Strength MPa	at 0.2% Offset MPa	50.8 mm or 4D %
101.62 to 127.00	L	515	495	9
	LT	525	475	7
	ST	510	450	3
127.02 to 152.40	L	515	495	8
	LT	525	475	7
	ST	505	450	3
152.42 to 177.80	L	510	490	8
	LT	515	460	5
	ST	495	440	3

3.3.2 Electrical Conductivity

Shall be not lower than 39.0% IACS (International Annealed Copper Standard) (22.6 MS/m), determined on the plate surface.

3.3.3 Exfoliation-Corrosion Resistance

Specimens cut from plate shall not exhibit exfoliation corrosion at a T/2 plane greater than that illustrated by Photograph B, Figure 2, of ASTM G34.

3.3.4 Stress-Corrosion Cracking

When specified, specimens from plate shall be tested in accordance with ASTM G47 and shall show no evidence of stress-corrosion cracking stressed in the short-transverse direction (perpendicular to grain flow) to 26 ksi (180 MPa).

3.3.5 Fracture Toughness

When specified, plane strain fracture toughness shall be tested in accordance with ASTM E399 and ASTM B645 for plate 4.001 to 7.000 inches (101.62 to 177.80 mm), inclusive, in nominal thickness. A valid K_{Ic} meeting the requirements of ASTM E399 or a K_Q "usable for lot release" in accordance with ASTM B645 shall meet or exceed the values specified in Table 3.

Table 3A - Minimum K_{Ic} or K_Q "usable for lot release" fracture toughness, inch/pound units

Thickness Inches	L-T Direction ksi√inch	T-L Direction ksi√inch	S-L Direction ksi√inch
4.001 to 5.000	29	24	24
5.001 to 6.000	27	22	23
6.001 to 7.000	26	21	22

Table 3B - Minimum K_{Ic} or K_Q "usable for lot release" fracture toughness, SI units

Thickness Millimeters	L-T Direction MPa√m	T-L Direction MPa√m	S-L Direction MPa√m
101.62 to 127.00	32	26	26
127.02 to 152.40	30	24	25
152.42 to 177.80	29	23	24

3.3.6 Compressive Yield Strength

When specified, specimens from plate shall be tested in accordance with AMS2355 and compressive yield strength shall be as shown in Table 4.

Table 4A - Minimum compressive yield, inch/pound units

Thickness Inches	Grain Direction	Compressive Yield Strength ksi
4.001 to 5.000	L	71
5.001 to 6.000	L	71
6.001 to 7.000	L	70

Table 4B - Minimum compressive yield, SI units

Thickness Millimeters	Grain Direction	Compressive Yield Strength MPa
101.62 to 127.00	L	490
127.02 to 152.40	L	490
152.42 to 177.80	L	485

3.3.7 Mechanical property requirements for product outside of the range covered by 1.1 shall be agreed upon between the purchaser and producer and reported per 4.4.1 (see 8.5).

3.4 Quality

Products, as received by the purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from conditions detrimental to usage of the plate. Any detrimental conditions found during the customer's manufacturing process are subject to rejection.

3.4.1 Each plate shall be subjected to ultrasonic inspection in accordance with ASTM B594 and shall meet ultrasonic Class A requirements as described in ASTM B594.

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 the products 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 products conform to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (see 3.1), tensile properties (see 3.3.1), electrical conductivity (see 3.3.2), tolerances (see 3.5), ultrasonic inspection (see 3.4.1), stress-corrosion cracking when specified (see 3.3.4), fracture toughness (see 3.3.5), and compressive yield strength (see 3.3.6) are acceptance tests and, except for composition, shall be performed on each inspection lot.

4.2.2 Periodic Tests

Exfoliation-corrosion resistance (see 3.3.3) is a periodic test and shall be performed at a frequency selected by the producer unless frequency of testing is specified by the purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS2355 and the following:

4.3.1 When fracture toughness testing is specified, specimens for each orientation specified by the purchaser shall be taken from the center width of at least one plate in each lot.

4.3.1.1 For L-T and T-L test orientations for plate 4.001 to 7.000 inches (101.62 to 177.80 mm), inclusive, in nominal thickness, use specimens having a minimum thickness (B) of 2 inches (51 mm) and a width (W) of 4.0 inches (102 mm), centered at T/4.

4.3.1.2 For the S-L test orientation, the test specimens shall be centered at T/2. The test specimen dimensions shall meet the requirements of ASTM E399 and ASTM B645.