AEROSPACE MATERIAL SPECIFICATION

AMS4473™	REV. B
Issued 2011-09 Revised 2022-10 Superseding AMS4473A	

Aluminum Alloy Plate (2624-T39)
4.1Cu - 1.4Mg - 0.6Mn
Solution Heat Treated, Cold Worked and Naturally Aged
(Composition similar to UNS A92624)

RATIONALE

AMS4473B results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (3.4.4, 3.7, 4.4.1, 5.1.1, 8.4), update applicable documents (Section 2) and elongation header (Table 2B), and allow the use of the immediate prior specification revision (8.3).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of plate 0.750 to 1.500 inch (19.05 to 38.10 mm), inclusive, in nominal thickness (see 8.5).

1.2 Application

This product has been used typically for structural parts requiring a high level of mechanical properties and good damage tolerance, 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/AMS4473B/

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 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 E399	Linear-Elastic Plane-Strain Fracture Toughness of Metallic Materials
ASTM E561	KR Curve Determination

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	--	0.08
Iron	--	0.08
Copper	3.8	4.3
Manganese	0.45	0.7
Magnesium	1.2	1.6
Chromium	--	0.05
Zinc	--	0.15
Titanium	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

Solution heat treated, cold rolled ~10% and stretched ~1% after solution heat treatment and naturally aged to produce a T39 temper (refer to ANSI H35.1/H35.1M).

3.3 Heat Treatment

Solution heat treatment shall be performed in accordance with AMS2772 as applicable to 2XXX alloys. The actual practices are considered proprietary.

3.4 Properties

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

3.4.1 Tensile Properties

Shall be as specified in Table 2.

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

Nominal Thickness Inches	Specimen Orientation	Tensile Strength ksi	Yield Strength At 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.750 to 1.500, incl	Longitudinal	68.0	62.0	11
	Long-Transverse	71.0	58.0	9

Table 2B - Minimum tensile properties, SI units

Nominal Thickness Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength At 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
19.05 to 38.10, incl	Longitudinal	469	427	11
	Long-Transverse	490	400	

3.4.2 Plane Strain Fracture Toughness

3.4.2.1 Plane strain fracture toughness, when required by purchaser, shall be tested in accordance with ASTM E399 and ASTM B645. The required test orientations shall be specified by the purchaser.

3.4.2.2 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 shown in Table 3.

Table 3 - Minimum plane strain fracture toughness

Nominal Thickness Inches	Nominal Thickness Millimeters	Specimen Orientation	K_{Ic} or K_Q ksi √Inch	K_{Ic} or K_Q MPa √m
0.750 to 1.500, incl	19.05 to 38.10, incl	L-T	39	43
		T-L	33	36

3.4.3 Plane Stress Fracture Toughness

3.4.3.1 Plane stress fracture toughness (K_{app}) shall be tested in accordance with ASTM E561 and ASTM B646.

3.4.3.2 A K_{app} value meeting the requirements of ASTM E561 and ASTM B646 shall meet or exceed the values shown in Table 4.

Table 4 - Minimum plane stress fracture toughness

Nominal Thickness Inches	Nominal Thickness Millimeters	Specimen Orientation	ksi √Inch	MPa √m
0.750 to 1.500, incl	19.05 to 38.10, incl	L-T	106	116

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

3.5 Quality

Plate, 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 product.

3.5.1 Each plate 0.750 inch (19.05 mm) and over in nominal thickness shall be ultrasonically inspected in accordance with ASTM B594 and shall meet ultrasonic class A requirements.

3.6 Tolerances

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

3.7 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 product 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 product conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), long-transverse and longitudinal tensile properties (3.4.1), plane stress fracture toughness (3.4.3), ultrasonic soundness (3.5.1), dimensional tolerances (3.6) and, when required, plane strain fracture toughness (3.4.2) are acceptance tests and, except for composition, shall be performed on each inspection lot.

4.3 Sampling and Testing

Shall be in accordance with AMS2355 and the following:

Tensile specimens shall be taken with axis of specimens parallel to each applicable grain flow direction specified in Table 2.

4.3.1 Plane strain fracture toughness testing of the L-T and T-L test orientations of plate shall use specimens having a width (W) of 3.0 inches (76 mm) and a thickness (B) of full plate thickness.

4.3.2 Plane stress fracture toughness shall be taken and tested in the L-T orientation. The test specimen shall be of the M(T) type and have a width (W) of 16 inches (406 mm), a thickness (B) of 0.25 inch (6.35 mm) and shall be centered at mid-thickness (T/2). The original crack size ($2a_o$) shall be 4 inches (102 mm).