



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS4101™</b>	<b>REV. G</b>
	Issued 1978-07 Reaffirmed 2006-04 Revised 2025-04	
Superseding AMS4101F		
Aluminum Alloy, Plate 4.4Cu - 1.5Mg - 0.60Mn (2124-T851) Solution Heat Treated, Stretched, and Precipitation Heat Treated (Composition similar to UNS A92124)		

### RATIONALE

AMS4101G results from a Five-Year Review and update of this specification with changes to update wording to prohibit unauthorized exceptions (see 3.3.1.1, 3.6, and 8.3), update Applicable Documents (see Section 2) and size range for Ultrasonic Soundness (see 3.3.3), 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 1.0 to 6 inches (25.4 to 152.4 mm), inclusive, in nominal thickness (see 8.5).

##### 1.2 Application

This plate has been used typically for parts requiring a high level of mechanical properties up to 300 °F (149 °C), 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](http://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

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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](http://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 of Metallic Materials

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 H35.2 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	--	0.20
Iron	--	0.30
Copper	3.8	4.9
Manganese	0.30	0.9
Magnesium	1.2	1.8
Chromium	--	0.10
Zinc	--	0.25
Titanium	--	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

### 3.2 Condition

Solution heat treated, stretched to produce a nominal permanent set of 2% but not less than 1-1/2% nor more than 3%, and precipitation heat treated. Heat treatments shall be performed in accordance with AMS2772.

3.2.1 Plate shall receive no further straightening operations after stretching.

### 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 Tensile Properties

Shall be as shown 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 %
1.0 to 2, incl <sup>(1)</sup>	Longitudinal	66.0	57.0	6
	Long-Trans.	66.0	57.0	5
	Short-Trans.	64.0	55.0	1.5
Over 2 to 3, incl	Longitudinal	65.0	57.0	6
	Long-Trans.	65.0	57.0	4
	Short-Trans.	63.0	55.0	1.5
Over 3 to 4, incl	Longitudinal	65.0	56.0	5
	Long-Trans.	65.0	56.0	4
	Short-Trans.	62.0	54.0	1.5
Over 4 to 5, incl	Longitudinal	64.0	55.0	5
	Long-Trans.	64.0	55.0	4
	Short-Trans.	61.0	53.0	1.5
Over 5 to 6, incl	Longitudinal	63.0	54.0	5
	Long-Trans.	63.0	54.0	4
	Short-Trans.	58.0	51.0	1.5

<sup>(1)</sup> Short-transverse tensile properties applicable to thicknesses of 1.500 inches and greater.

**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 %
25.4 to 50.8, incl <sup>(1)</sup>	Longitudinal	455	393	6
	Long-Trans.	455	393	5
	Short-Trans.	441	379	1.5
Over 50.8 to 76.2, incl	Longitudinal	448	393	6
	Long-Trans.	448	393	4
	Short-Trans.	434	379	1.5
Over 76.2 to 101.6, incl	Longitudinal	448	386	5
	Long-Trans.	448	386	4
	Short-Trans.	427	372	1.5
Over 101.6 to 127.0, incl	Longitudinal	441	379	5
	Long-Trans.	441	379	4
	Short-Trans.	421	365	1.5
Over 127.0 to 152.4, incl	Longitudinal	434	372	5
	Long-Trans.	434	372	4
	Short-Trans.	400	352	1.5

<sup>(1)</sup> Short-transverse tensile properties applicable to thicknesses of 38.1 mm and greater.

3.3.1.1 Mechanical property requirements for plate outside the thickness range of 1.1 shall be as agreed upon by the purchaser and producer and reported per 4.4.1 (see 8.5).

### 3.3.2 Stress-Corrosion Resistance

Specimens cut from plate shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction to 50% of the specified minimum long-transverse yield strength, determined in accordance with ASTM G47.

### 3.3.3 Ultrasonic Soundness

Each plate, 1.0 to 6 inches (25.4 to 152.4 mm) in nominal thickness, shall be inspected in accordance with ASTM B594 and shall meet Class A ultrasonic requirements.

### 3.3.4 Fracture Toughness

When specified, plate, 1.5 to 6 inches (38 to 152 mm), inclusive, in nominal thickness, shall meet the values of  $K_{Ic}$ , shown in Table 3, determined in accordance with ASTM E399 and ASTM B645. The required test directions shall be as specified by the purchaser.

**Table 3 - Minimum fracture-toughness values**

Test Direction	$K_{Ic}$ ksi $\sqrt{\text{inch}}$	$K_{Ic}$ MPa $\sqrt{\text{m}}$
L-T	24.0	26.4
T-L	20.0	22.0
S-L	18.0	19.8

## 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.

### 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 plate 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 plate conforms to specified requirements.

### 4.2 Classification of Tests

#### 4.2.1 Acceptance Tests

Composition (see 3.1), tensile properties (see 3.3.1), ultrasonic soundness (see 3.3.3), tolerances (see 3.5) and, when specified, fracture toughness (see 3.3.4) are acceptance tests and shall be performed on each lot.