



AEROSPACE MATERIAL SPECIFICATION

AMS4372™**REV. B**Issued 2018-03
Revised 2022-08

Superseding AMS4372A

Aluminum Alloy, Plate
3.5Cu - 1.0Li - 0.40Mg - 0.35Mn - 0.45Ag - 0.12Zr (2050-T34)
Solution Heat Treated and Stress Relieved
(Composition similar to UNS A92050)

RATIONALE

AMS4372B is the result of a Five-Year Review and update of this specification with changes to update general agreement language to prohibit unauthorized exceptions (8.5), applicable documents (Section 2, 2.4), and to allow the use of the immediate prior specification revision (8.4).

1. SCOPE

1.1 Form

This specification covers an aluminum-lithium alloy in the form of plate 0.500 to 6.500 inches (12.70 to 165.00 mm) in nominal thickness (see 8.6).

1.2 Application

This plate has been used typically for parts where low density is needed in combination with a high level of mechanical properties and very good resistance to stress-corrosion cracking, but usage is not limited to such applications. Material is delivered in T34 temper and artificially aged to obtain T82 temper by the end user.

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

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<https://www.sae.org/standards/content/AMS4372B/>

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 B660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B666/B666M	Identification Marking of Aluminum and Magnesium Products
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 <http://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	--	0.10
Copper	3.2	3.9
Manganese	0.20	0.50
Magnesium	0.20	0.6
Chromium	--	0.05
Nickel	--	0.05
Zinc	--	0.25
Titanium	--	0.10
Zirconium	0.06	0.14
Silver	0.20	0.7
Gallium	--	0.05
Lithium	0.7	1.3
Vanadium	--	0.05
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

3.2.1 As Received T34 Temper (refer to ANSI H35.1/H35.1M)

Solution heat treated in accordance with AMS2772, stretched to produce a nominal permanent set of 3.5%, but not less than 3.0% nor more than 4.5%, and naturally aged (see 8.2).

3.3 Properties

The material shall conform to the following requirements, determined in accordance with AMS2355 on the mill produced size.

3.3.1 As Solution Heat Treated, Stretched and Naturally Aged (T34 Temper) (refer to ANSI H35.1/H35.1M)

3.3.1.1 Tensile Properties shall be as shown in Table 2.

Table 2A - Minimum tensile properties in T34 temper, inch/pound units

Nominal Thickness Inches	Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.500 to 6.500, incl	Long-Trans.	50.0	34.0	17

Table 2B - Minimum tensile properties in T34 temper, SI units

Nominal Thickness Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
12.70 to 165.00, incl	Long-Trans.	345	234	17

3.3.2 Response to Temper Conversion

3.3.2.1 Product in the T34 temper, after precipitation heat treatment to the T82 temper (refer to ANSI H35.1/H35.1M) in accordance with AMS2772, shall have the properties shown in Table 3. Aging times and temperatures are proprietary and shall be provided to the heat treater.

Table 3A - Minimum tensile properties in T82 temper, inch/pound units

Nominal Thickness Inches	Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.500 to 1.500, incl	Longitudinal	72.0	68.0	7
	Long-Trans.	73.0	67.0	5
1.501 to 2.000, incl	Longitudinal	72.0	67.0	7
	Long-Trans.	73.0	65.0	5
	Short-Trans.	71.0	61.0	2
2.001 to 3.000, incl	Longitudinal	72.0	67.0	7
	Long-Trans.	72.0	65.0	5
	Short-Trans.	71.0	61.0	2
3.001 to 4.000, incl	Longitudinal	71.0	67.0	6
	Long-Trans.	72.0	65.0	4
	Short-Trans.	70.0	60.0	1.5
4.001 to 5.000, incl	Longitudinal	71.0	66.0	6
	Long-Trans.	71.0	64.0	3
	Short-Trans.	69.0	59.0	1.5
5.001 to 6.500, incl	Longitudinal	71.0	66.0	5
	Long-Trans.	71.0	63.0	3
	Short-Trans.	69.0	57.0	1.5

Table 3B - Minimum tensile properties in T82 temper, SI units

Nominal Thickness Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
12.70 to 40.00, incl	Longitudinal	496	469	6
	Long-Trans.	503	462	4
Over 40.00 to 50.00, incl	Longitudinal	496	462	6
	Long-Trans.	503	448	4
	Short-Trans.	490	421	2
Over 50.00 to 80.00, incl	Longitudinal	496	462	6
	Long-Trans.	496	448	4
	Short-Trans.	490	421	2
Over 80.00 to 100.00, incl	Longitudinal	490	462	5
	Long-Trans.	496	448	4
	Short-Trans.	483	414	1.5
Over 100.00 to 130.00, incl	Longitudinal	490	455	5
	Long-Trans.	490	441	3
	Short-Trans.	476	407	1.5
Over 130.00 to 165.00, incl	Longitudinal	490	455	4
	Long-Trans.	490	434	3
	Short-Trans.	476	393	1.5

3.3.2.2 Stress-Corrosion Resistance (T82 Temper)

Specimens machined and tested in accordance with ASTM G47 from plate 0.750 inch (19.05 mm) and over in nominal thickness shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction at 45.0 ksi (310 MPa) for 30 days.

3.3.3 Mechanical property requirements for product outside of the range covered by Tables 2 and 3 shall be agreed upon between purchaser and producer (see 8.6).

3.4 Quality

The product, 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.

3.4.1 Each plate shall be ultrasonically inspected in accordance with ASTM B594 and shall meet ultrasonic Class A requirements.

3.5 Tolerance

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

3.6 Exceptions

Any exceptions shall be authorized by 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 the specified requirements.