AEROSPACE MATERIAL SPECIFICATION

AMS4045™	REV. M

Issued 1949-06
Reaffirmed 2000-07
Revised 2022-08

Superseding AMS4045L

Aluminum Alloy Sheet and Plate
5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr
7075: (-T6 Sheet, -T651 Plate)
Solution and Precipitation Heat Treated

(Composition similar to UNS A97075)

RATIONALE

AMS4045M results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (3.3.1.1, 3.3.2.1, 3.6, 4.4.1, 5.1.1, 8.5), add provisions for usage of AS6279 (Section 2, 3.7), update applicable documents (Section 2, 8.2) and ordering information (8.6), and allow the use of the immediate prior specification revision (8.4).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of sheet and plate 0.008 to 4.000 inches (0.20 to 101.6 mm), inclusive, in thickness (see 8.6).

1.2 Application

These products have been used typically for structural components, including machined parts subject to excessive warpage during machining, but usage is not limited to such applications.

1.2.1 Certain design and processing procedures may cause these products to become susceptible to stress-corrosion cracking; ARP823 recommends practices to minimize such conditions.

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.

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/AMS4045M/

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
ARP823	Minimizing Stress-Corrosion Cracking in Wrought Heat-Treatable Aluminum Alloy Products
AS6279	Standard Practice for Production, Distribution, and Procurement of Metal Stock
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 B660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B666/B666M	Identification Marking of Aluminum and Magnesium 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	--	0.40
Iron	--	0.50
Copper	1.2	2.0
Manganese	--	0.30
Magnesium	2.1	2.9
Chromium	0.18	0.28
Zinc	5.1	6.1
Titanium	--	0.20
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

The product shall be supplied in the following condition; heat treatments shall be performed in accordance with AMS2772:

3.2.1 Sheet

Solution and precipitation heat treated to temper T6 (refer to ANSI H35.1/H35.1M).

3.2.2 Plate

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 to temper T651 (refer to ANSI H35.1/H35.1M).

3.2.2.1 Plate shall receive no further straightening operations after stretching.

3.3 Properties

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

3.3.1 Tensile Properties

Shall be as specified in Table 2 and 3.3.1.1.

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

Nominal Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.008 to 0.011, incl	74.0	63.0	5
Over 0.011 to 0.039, incl	76.0	67.0	8
Over 0.039 to 0.125, incl	78.0	68.0	9
Over 0.125 to 0.187, incl	79.0	69.0	9
Over 0.187 to 0.249, incl	80.0	69.0	9
Over 0.249 to 0.499, incl	78.0	67.0	9
Over 0.499 to 1.000, incl	78.0	68.0	7
Over 1.000 to 2.000, incl	77.0	67.0	6
Over 2.000 to 2.500, incl	76.0	64.0	5
Over 2.500 to 3.000, incl	72.0	61.0	5
Over 3.000 to 3.500, incl	71.0	58.0	5
Over 3.500 to 4.000, incl	67.0	54.0	3

Table 2B - Minimum tensile properties, SI units

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
0.20 to 0.28, incl	510	434	5
Over 0.28 to 0.99, incl	524	462	8
Over 0.99 to 3.18, incl	538	469	9
Over 3.18 to 4.75, incl	545	476	9
Over 4.75 to 6.32, incl	552	476	9
Over 6.32 to 12.67, incl	538	462	9
Over 12.67 to 25.40, incl	538	469	7
Over 25.40 to 50.80, incl	531	462	6
Over 50.80 to 63.50, incl	524	441	5
Over 63.50 to 76.20, incl	496	421	5
Over 76.20 to 88.90, incl	490	400	5
Over 88.90 to 101.60, incl	462	372	3

3.3.1.1 Tensile property requirements for plate over 4.000 inches (101.60 mm) in nominal thickness shall be as agreed upon by purchaser and producer and reported per 4.4.1.

3.3.2 Bending

Product 0.008 to 0.499 inch (0.20 to 12.67 mm), inclusive, in nominal thickness shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the bend factor shown in Table 3 times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

Table 3 - Bending parameters

Nominal Thickness Inches	Nominal Thickness Millimeters	Bend Factor
0.008 to 0.020, incl	0.20 to 0.51, incl	7
Over 0.020 to 0.062, incl	Over 0.51 to 1.57, incl	8
Over 0.062 to 0.091, incl	Over 1.57 to 2.31, incl	9
Over 0.091 to 0.125, incl	Over 2.31 to 3.18, incl	10
Over 0.125 to 0.249, incl	Over 3.18 to 6.32, incl	11
Over 0.249 to 0.499, incl	Over 6.32 to 12.67, incl	14

3.3.2.1 Bending requirements for product over 0.499 inch (12.67 mm) in nominal thickness shall be as agreed upon by purchaser and producer and reported per 4.4.1 (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 When specified, each plate 0.500 inch (12.70 mm) and over in nominal thickness shall be ultrasonically inspected in accordance with ASTM B594 and shall meet the requirements of Table 4, as applicable.

Table 4 - Ultrasonic class

Nominal Thickness Inches	Nominal Thickness Millimeters	Ultrasonic Class
Over 0.500 to 1.500, excl	Over 12.70 to 38.10, excl	B
Over 1.500 to 3.000, incl	Over 38.10 to 76.20, incl	A
Over 3.000 to 4.000, incl	Over 76.20 to 101.60, incl	B

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.

3.7 Production, distribution, and procurement of metal stock shall comply with AS6279. This requirement becomes effective 18 months after publication of AMS4045M.

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.