

**AEROSPACE
MATERIAL
SPECIFICATION**

AMS 4045J

Issued JUN 1949
Reaffirmed JUL 2000
Revised MAY 2007

Superseding AMS 4045H

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

AMS 4045J is a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of sheet and plate.

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.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
AMS 2772	Heat Treatment of Aluminum Alloy Raw Materials
ARP823	Minimizing Stress-Corrosion Cracking in Wrought Heat-Treatable Aluminum Alloy Products
AS1990	Aluminum Alloy Tempers

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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 B 660 Packaging/Packing of Aluminum and Magnesium Products
 ASTM B 666/B 666M Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Publications

Available from ANSI American National Standards Institute, 25 West 43rd Street, New York, NY 10036, Tel: 212-642-4900, www.ansi.org.

ANSI H35.2/H 35.2M Dimensional Tolerances for Aluminum Mill Products

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS 2355.

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 AMS 2772:

3.2.1 Sheet

Solution and precipitation heat treated to temper T6 (See AS1990).

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 (See AS1990).

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 AMS 2355 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 vendor.

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 Inch	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 vendor.

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.

3.5 Tolerances

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

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for vendor'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), tensile properties (3.3.1), and tolerances (3.5) are acceptance tests and except for composition, shall be performed on each lot.

4.2.2 Periodic Tests

Bending (3.3.2) is a periodic test and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS 2355.

4.4 Reports

The vendor of the product shall furnish with each shipment a report stating that the product conforms to the composition and tolerances, and showing numerical results of tests for the other acceptance test requirements. This report shall include the purchase order number, lot number, AMS 4045J, size, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.5 Resampling and Retesting

Shall be in accordance with AMS 2355.