AEROSPACE MATERIAL SPECIFICATION

AMS4025	REV. M

Issued 1942-12
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Superseding AMS4025L

Aluminum Alloy, Sheet and Plate
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-O)
Annealed
(Composition similar to UNS A96061)

RATIONALE

AMS4025M removes T42 capability testing and revises Composition (3.1.1), Properties (3.3.1), Acceptance Tests (4.2.1), Periodic Tests (4.2.2), and Reports (4.4.1), and 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 from 0.006 to 3.000 inches (0.15 to 76.20 mm) in thickness, inclusive(See 8.4).

1.2 Application

These products have been used typically for parts where moderate formability and response to solution and precipitation heat treatment are required, 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 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.

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

AS1990 Aluminum Alloy Tempers

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**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS4025M

2.2 Aluminum Association Publications

Available from The Aluminum Association, 1525 Wilson Boulevard Suite 600 Arlington, VA 22209, Tel: 703-358-2960, www.aluminum.org.

International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys (The “Teal Sheets”)

2.3 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 666MIdentification Marking of Aluminum Products

2.4 ANSI Publications

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

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

ANSI H35.2M Dimensional tolerances for Aluminum Mill Products (Metric)

3. TECHNICAL REQUIREMENTS

3.1 Shall conform to the percentages by weight as shown in Table 1, determined in accordance with AMS2355.

TABLE 1 - COMPOSITION

Element	min	max
Silicon	0.40	0.8
Iron	--	0.7
Copper	0.15	0.40
Manganese	--	0.15
Magnesium	0.8	1.2
Chromium	0.04	0.35
Zinc	--	0.25
Titanium	--	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.1.1 In case there is a discrepancy in the values listed in Table 1 with those listed in the “International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys”(known as the “Teal Sheets”), the composition limits registered with the Aluminum Association and published in the “Teal Sheets” shall be the controlling composition.

3.2 Condition

Annealed in accordance with AMS2772.

3.3 Properties

3.3.1 Mechanical property requirements for product outside of the range covered by 1.1 shall be agreed upon between purchaser and producer.

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

3.3.2 As Annealed

3.3.2.1 Tensile Properties in the Annealed (-O) Condition

Shall be as shown in Table 2.

TABLE 2A - TENSILE PROPERTIES, INCH/POUND UNITS

Nominal Thickness Inches	Tensile Strength ksi, max	Yield Strength at 0.2% Offset ksi, max	Elongation in 2 Inches or 4D %, min
0.006 to 0.007, incl	22.0	12.0	10
Over 0.007 to 0.009, incl	22.0	12.0	12
Over 0.009 to 0.020, incl	22.0	12.0	14
Over 0.020 to 0.128, incl	22.0	12.0	16
Over 0.128 to 0.499, incl	22.0	12.0	18
Over 0.499 to 1.000, incl	22.0	--	18
Over 1.000 to 3.000, incl	22.0	--	16

TABLE 2B - TENSILE PROPERTIES, SI UNITS

Nominal Thickness Millimeters	Tensile Strength MPa, max	Yield Strength at 0.2% Offset MPa, max	Elongation in 50.8 mm or 4D %, min
0.15 to 0.18, incl	152	83	10
Over 0.18 to 0.23, incl	152	83	12
Over 0.23 to 0.51, incl	152	83	14
Over 0.51 to 3.25, incl	152	83	16
Over 3.25 to 12.67, incl	152	83	18
Over 12.67 to 25.40, incl	152	--	18
Over 25.40 to 76.20, incl	152	--	16

3.3.2.2 Bending in the Annealed (-O) Condition

Product 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
0.006 to 0.020, incl	0.15 to 0.51, incl	0
Over 0.020 to 0.128, incl	Over 0.51 to 3.25, incl	1
Over 0.128 to 0.249, incl	Over 3.25 to 6.32, incl	2
Over 0.249 to 0.499, incl	Over 6.32 to 12.67, incl	3

3.3.3 In the T62 Temper

The product, as received by purchaser in the Annealed (O) or the As Fabricated (F) condition, shall have the properties of 3.3.3.1 and 3.3.3.2, after solution heat treatment and artificial aging to the T62 temper (See AS1990) in accordance with AMS2772.

3.3.3.1 Tensile Properties in the T62 Temper

Shall be as shown in Table 4.

TABLE 4A - 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 %
0.006 to 0.007, incl	42.0	35.0	4
Over 0.007 to 0.009, incl	42.0	35.0	6
Over 0.009 to 0.020, incl	42.0	35.0	8
Over 0.020 to 0.499, incl	42.0	35.0	10
Over 0.499 to 1.000, incl	42.0	35.0	9
Over 1.000 to 2.000, incl	42.0	35.0	8
Over 2.000 to 4.000, incl	42.0	35.0	6

TABLE 4B - 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 %
0.15 to 0.18, incl	290	241	4
Over 0.18 to 0.23, incl	290	241	6
Over 0.23 to 0.51, incl	290	241	8
Over 0.51 to 12.67, incl	290	241	10
Over 12.67 to 25.40, incl	290	241	9
Over 25.40 to 50.80, incl	290	241	8
Over 50.80 to 101.16, incl	290	241	6

3.3.3.2 Bending

Product 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 5 times the nominal thickness of the product with axis of bend parallel to direction of rolling.

TABLE 5 - BENDING PARAMETERS

Nominal Thickness Inch	Nominal Thickness Millimeters	Bend Factor
0.006 to 0.020, incl	0.15 to 0.51, incl	2
Over 0.020 to 0.036, incl	Over 0.51 to 0.91, incl	3
Over 0.036 to 0.064, incl	Over 0.91 to 1.63, incl	4
Over 0.064 to 0.128, incl	Over 1.63 to 3.25, incl	5
Over 0.128 to 0.249, incl	Over 3.25 to 6.32, incl	6
Over 0.249 to 0.499, incl	Over 6.32 to 12.67, incl	7

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.