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400 Commonwealth Dr., Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4025H

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Superseding AMS 4025G

ALUMINUM ALLOY SHEET AND PLATE
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-0)
Annealed

UNS A96061

1. SCOPE:

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

1.2 Application: Primarily for parts where moderate formability and response to precipitation heat treatment are required.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2202 - Tolerances, Aluminum Alloy and Magnesium Alloy Sheet and Plate
MAM 2202 - Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Sheet and Plate
AMS 2350 - Standards and Test Methods
AMS 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings
MAM 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units
AMS 2770 - Heat Treatment of Wrought Aluminum Alloy Parts

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM B660 - Packaging/Packing of Aluminum and Magnesium Products

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Specifications:

MIL-H-6088 - Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS 2355 or MAM 2355:

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

3.2 Condition: Annealed in accordance with MIL-H-6088.

3.3 Properties: The product shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 As Annealed:

3.3.1.1 Tensile Properties: Shall be as specified in Table I and 3.3.1.1.1. Ø

TABLE I

Nominal Thickness Inches	Tensile Strength psi, max	Yield Strength at 0.2% Offset psi, maximum	Elongation in 2 Inches or 4D %, minimum
0.006 to 0.007, incl	22,000	12,000	10
Over 0.007 to 0.009, incl	22,000	12,000	12
Over 0.009 to 0.020, incl	22,000	12,000	14
Over 0.020 to 0.128, incl	22,000	12,000	16
Over 0.128 to 0.499, incl	22,000	12,000	18
Over 0.499 to 1.000, incl	22,000	--	18
Over 1.000 to 3.000, incl	22,000	--	16

TABLE I (SI)

Nominal Thickness Millimetres	Tensile Strength MPa, max	Yield Strength at 0.2% Offset MPa, maximum	Elongation in 50.8 mm or 4D %, minimum
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

3.3.1.1.1 Tensile properties of plate over 3.000 inches (76.20 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.1.2 Bending: Product 0.006 - 0.499 inches (0.15 - 12.67 mm), incl, in nominal thickness shall withstand, without cracking, bending at room temperature though an angle of 180 degrees around a diameter equal to the bend factor times the nominal thickness of the product with axis of bend parallel to direction of rolling.

Nominal Thickness		Bend
Inch	Millimetres	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

3.3.1.2.1 Bending requirements for plate over 0.499 inch (12.67 mm) in nominal thickness shall be as agreed upon by purchaser and vendor. Ø

3.3.2 After Heat Treatment: The product, as received by purchaser, shall have the following properties after solution and precipitation heat treatment in accordance with AMS 2770: Ø

3.3.2.1 Tensile Properties: Shall be as specified in Table II and 3.3.2.1.1.

TABLE II

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, minimum	Elongation in 2 Inches or 4D %, minimum
0.006 to 0.007, incl	42,000	35,000	4
Over 0.007 to 0.009, incl	42,000	35,000	6
Over 0.009 to 0.020, incl	42,000	35,000	8
Over 0.020 to 0.499, incl	42,000	35,000	10
Over 0.499 to 1.000, incl	42,000	35,000	9
Over 1.000 to 2.000, incl	42,000	35,000	8
Over 2.000 to 3.000, incl	42,000	35,000	6

TABLE II (SI)

Nominal Thickness Millimetres	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, minimum	Elongation in 50.8 mm or 4D %, minimum
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 76.20, incl	290	241	6

3.3.2.1.1 Tensile properties of plate over 3.000 inches (76.20 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.2.2 Bending: Product 0.006 - 0.499 inches (0.15 -12.67 mm), incl, 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 times the nominal thickness of the product with axis of bend parallel to direction of rolling.

Nominal Thickness		Bend Factor
Inch	Millimetres	
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

3.3.2.2.1 Bending requirements for plate 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 AMS 2202 or MAM 2202.

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 performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1), tensile properties as annealed (3.3.1.1) and after heat treatment (3.3.2.1), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for bending as annealed (3.3.1.2) and after heat treatment (3.3.2.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2305.

4.4 Reports: The vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, AMS 4025H, lot number, size, and quantity.

4.5 Resampling and Retesting: Shall be in accordance with AMS 2355 or MAM 2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each sheet and plate shall be marked on one face, in the respective location indicated below, with the alloy number, temper, AMS 4025, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be legible, shall be applied using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling. The markings shall have no deleterious effect on the product or its performance.

5.1.1 Flat Sheet and Plate Under 6 Inches (152 mm) Wide: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 feet (914 mm).

5.1.2 Ø Flat Sheet and Plate 0.375 Inch (9.52 mm) and Under Thick, 6 - 60 Inches (152 - 1524 mm), Incl, Wide, and 36 - 200 Inches (914 - 5080 mm), Incl, Long: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 feet (914 mm), the rows being spaced approximately 6 inches (152 mm) on centers across the width and staggered. Every third row shall show the manufacturer's identification and nominal thickness. The other rows shall show the alloy number, temper, and AMS 4025.

5.1.3 Ø Flat Sheet and Plate Over 0.375 Inch (9.52 mm) Thick, or Over 60 Inches (1524 mm) Wide, or Over 200 Inches (5080 mm) Long: Shall be marked as in 5.1.2 or, at vendor's discretion, shall be marked in one or two rows of characters recurring at intervals not greater than 3 feet (914 mm) and running around the periphery of the piece. If one row is used, it shall show all information of 5.1. If two rows are used, one row shall show the alloy number, temper, and AMS 4025; the second row shall show the manufacturer's identification and nominal thickness.