

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

Issued 1 DEC 1942
Revised 1 OCT 1993
Superseding AMS 4027K

ALUMINUM ALLOY, SHEET AND PLATE
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061; -T6 Sheet, -T651 Plate)
Solution and Precipitation Heat Treated

UNS A96061

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 parts where strength is required and limited formability is acceptable, but usage is not limited to such applications.

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 publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

| | |
|----------|---|
| AMS 2202 | Tolerances, Aluminum Alloy and Magnesium Alloy Sheet and Plate |
| MAM 2202 | Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Sheet and Plate |
| AMS 2355 | Quality Assurance Sampling and Testing, Aluminum and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings |
| MAM 2355 | Quality Assurance Sampling and Testing, Aluminum and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units |
| AMS 2811 | Identification, Aluminum and Magnesium Alloy Wrought Products |

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2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

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

TABLE 1 - Composition

| Element | 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 |
| Residual Elements, each | -- | 0.05 |
| Residual Elements, total | -- | 0.15 |
| Aluminum | remainder | |

3.2 Condition:

The product shall be supplied in the following condition:

- 3.2.1 Sheet: Solution and precipitation heat treated in accordance with MIL-H-6088.
- 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; heat treatments shall be performed 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 Tensile Properties: Shall be as specified in Table 2.

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 % |
|-----------------------------|-------------------------|---|--------------------------------------|
| 0.006 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 |
| Over 4.000 to 6.000, incl | 40.0 | 35.0 | 6 |

TABLE 2B - Minimum Tensile Properties, SI Units

| Nominal Thickness mm | 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 101.60, incl | 290 | 241 | 6 |
| Over 101.60 to 152.40, incl | 276 | 241 | 6 |

3.3.2 Bending: The 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 mm | 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.

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2202 or MAM 2202.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

(R)

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. 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 for composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests for bending (3.3.2) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing:

(R)

Shall be in accordance with AMS 2355 or MAM 2355.