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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4078F

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Superseding AMS 4078E

Aluminum Alloy Plate
(7075-T7351)
Solution Heat Treated, Stress Relieved, and Overaged

UNS A97075

1. SCOPE:

1.1 Form:

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

1.2 Application:

This plate has been used typically for machined parts subject to excessive warpage during machining due to residual stresses and for parts requiring high strength and resistance to stress-corrosion cracking, 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 form 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

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

AMS 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings

MAM 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 666/B 666M Identification Marking of Aluminum 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

2.4 ANSI Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

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 AMS 2355 or MAM 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:

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 treatment shall be performed in accordance with MIL-H-6088.

3.2.1 Plate shall receive no straightening operations after stretching.

3.3 Properties:

Plate shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355 on the mill produced size.

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 %
0.250 to 1.000, incl	69.0	57.0	7
Over 1.000 to 2.000, incl	69.0	57.0	6
Over 2.000 to 2.500, incl	66.0	52.0	6
Over 2.500 to 3.000, incl	64.0	49.0	6
Over 3.000 to 3.500, incl	63.0	49.0	6
Over 3.500 to 4.000, incl	61.0	48.0	6

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 %
6.35 to 25.40, incl	476	393	7
Over 25.40 to 50.80, incl	476	393	6
Over 50.80 to 63.50, incl	455	359	6
Over 63.50 to 76.20, incl	441	338	6
Over 76.20 to 88.90, incl	434	338	6
Over 88.90 to 101.60, incl	421	331	6

3.3.2 Corrosion Resistance: Resistance to stress corrosion cracking and to exfoliation-corrosion shall be acceptable if the plate conforms to 3.3.2.1 or 3.3.2.2.

3.3.2.1 If electrical conductivity is not lower than 38.0% IACS (International Annealed Copper Standard) (22.0 MS/m), determined on the surface of specimens used for tensile testing.

3.3.2.2 If electrical conductivity is 38.0 to 39.9% (22.0 to 23.1 MS/m) inclusive, and yield strength does not exceed the specified minimum by more than 11.9 ksi (82 MPa).

3.3.2.3 If the requirements of 3.3.2.1 or 3.3.2.2 are not met, the plate may be given additional precipitation heat treatment or re-heat treated. If, after such treatment, all specified properties are met, the plate is acceptable.

3.3.2.4 If the conductivity is below 38.0% IACS (22.0 MS/m), the product is not acceptable and must be reprocessed regardless of tensile property load.

3.3.3 Stress-Corrosion Resistance: Specimens cut from plate 0.750 inches (19.05 mm) and over in nominal thickness shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction to 75% of the applicable minimum yield strength specified in 3.3.1.

3.4 Quality:

Plate, 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 plate.

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 B 594 and shall meet the requirements of 3.4.1.1 or 3.4.1.2 as applicable.

3.4.1.1 Plates weighing 2000 pounds (907 kg) and under shall meet the requirements for ultrasonic class shown in Table 3.

TABLE 3 - Ultrasonic Class

Nominal Thickness Inches	Nominal Thickness Millimeters	Ultrasonic Class
0.500 to 1.500, excl	12.70 to 38.10, excl	B
1.500 to 3.000, incl	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.