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400 Commonwealth Dr., Warrendale, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4084B
Superseding AMS 4084A

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ALUMINUM ALLOY SHEET
5.7Zn - 2.2Mg - 1.6Cu - 0.22Cr (7475-T61)
Solution and Precipitation Heat Treated

UNS A97475

1. SCOPE:

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

1.2 Application: Primarily for structural applications requiring sheet with high static strength, moderate fatigue strength, and high fracture-toughness.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications 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

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B646 - Fracture Toughness Testing of Aluminum Alloys
ASTM E338 - Sharp-Notch Tension Testing of High-Strength Sheet Materials
ASTM E561 - R-Curve Determination

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

2.3.2 Military Standards:

MIL-STD-649 - Aluminum and Magnesium Products, Preparation for Shipment and Storage

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
Zinc	5.2	6.2
Magnesium	1.9	2.6
Copper	1.2	1.9
Chromium	0.18	0.25
Iron	--	0.12
Silicon	--	0.10
Manganese	--	0.06
Titanium	--	0.06
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition: Solution and precipitation heat treated. Furnace surveys and calibration of temperature controllers and recorders shall be in accordance with MIL-H-6088.

3.3 Properties: The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as follows, determined in accordance with AMS 2355 or MAM 2355:

3.3.1.1 Sheet 0.040 In. (1.00 mm) and Over in Nominal Thickness:

	Long-Transverse	Longitudinal
Tensile Strength, min	75,000 psi (515 MPa)	75,000 psi (515 MPa)
Yield Strength at 0.2% Offset, min	64,000 psi (440 MPa)	66,000 psi (455 MPa)
Elongation in 2 in. (50 mm), min	9%	9%

3.3.1.2 Sheet Under 0.040 In. (1.00 mm) in Nominal Thickness: As agreed upon by purchaser and vendor.

3.3.2 Critical-Stress-Intensity Factor: Critical-stress-intensity factor (K_C), determined in accordance with ASTM B646 and ASTM E561, or by other method agreed upon by purchaser and vendor, shall be as follows:

Nominal Thickness		K_C min T-L Direction	
Inch	Millimetres	ksi $\sqrt{in.}$	MPa $\sqrt{m}$
0.040 to 0.125, incl	1.00 to 3.00, incl	75	82
Over 0.125 to 0.249, incl	Over 3.00 to 6.25, incl	60	66

3.3.3 Notch Tensile Strength/Tensile Yield Strength (NTS/TYS) Ratio: The producer may guarantee that sheet meets the critical-stress-intensity factor (K_C) requirements based on correlation with notch tensile strength/tensile yield strength ratio in lieu of determining critical-stress-intensity factor (3.3.2) provided that he has established a correlation between the two tests for his sheet.

3.3.3.1 Notch tensile strength in the long-transverse direction shall be determined in accordance with ASTM E338. The values shall be divided by the long-transverse tensile yield strength to obtain the NTS/TYS ratio.

3.4 Quality: Sheet, 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 sheet.

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 sheet 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 sheet conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to requirements for composition (3.1), long-transverse and, when required by purchaser, longitudinal tensile properties (3.3.1), critical-stress-intensity factor (3.3.2) or notch tensile strength/tensile yield strength ratio (3.3.3), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2355 and the following:

4.3.1 Sampling for critical-stress-intensity factor and for notch tensile strength/tensile yield strength ratio shall be as agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 The vendor of sheet shall furnish with each shipment a report stating that the sheet conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, inspection lot number, AMS 4084B, size, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 4084B, contractor or other direct supplier of sheet, part number, and quantity. When sheet for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of sheet to determine conformance to the requirements of this specification and shall include in the report either a statement that the sheet conforms or copies of laboratory reports showing the results of tests to determine conformance.

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

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each sheet shall be marked on one face, in the respective location indicated below, with the alloy number and temper, AMS 4084, inspection lot number, 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 sheet or its performance.

5.1.1 Flat Sheet Under 6 In. (150 mm) Wide: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 ft (900 mm). The inspection lot number may appear in the row marking or may appear at only one location on each sheet.

5.1.2 Flat Sheet 6 - 60 In. (150 - 1500 mm), Incl, Wide, and 36 - 200 In. (900 - 5000 mm), Incl, Long: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (900 mm), the rows being spaced approximately 6 in. (150 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 and temper and AMS 4084. The inspection lot number may be included in the rows with the alloy number and temper and specification designations or may appear at only one location on each sheet.