



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AMS 4383B

Superseding AMS 4383A

Issued 9-30-66

Revised 1-15-78

MAGNESIUM ALLOY SHEET AND PLATE 2.0Th - 0.78Mn (HM21A-T81)

1. SCOPE:

- 1.1 Form: This specification covers a magnesium alloy in the form of sheet and plate.
- 1.2 Application: Primarily for parts requiring good weldability and good strength-to-weight-ratio up to 700° F (370°C).
- 1.3 Precautions: Material covered by this specification is radioactive. All applicable rules and regulations, including those of the Nuclear Regulatory Agency, pertaining to handling of radioactive material and all licensing provisions for use of such material should be observed.

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

- 2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.
 - 2.1.1 Aerospace Material Specifications:
 - AMS 2202 - Tolerance, Aluminum-Base and Magnesium-Base Alloy Sheet and Plate
 - AMS 2350 - Standards and Test Methods
 - AMS 2355 - Quality Assurance Sampling and Testing of Aluminum-Base and Magnesium-Base Alloys, Wrought Products (Except Forgings and Forging Stock) and Flash Welded Rings
 - 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
 - ASTM E9 - Compression Testing of Metallic Materials at Room Temperature
 - 2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.
 - 2.3.1 Military Standards:
 - MIL-STD-649 - Aluminum and Magnesium Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

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

	min	max
Thorium	1.5	2.5
Manganese	0.45	1.1
Other Impurities, each	--	0.10
Other Impurities, total	--	0.30
Magnesium		remainder

3.2 Condition: Solution heat treated, cold worked, precipitation heat treated, and pickled.

3.3 Properties: Product 0.125 - 0.312 in. (3.18 - 7.92 mm) in nominal thickness and 48 in. (1219 mm) and under in nominal width shall conform to the following requirements; property requirements shall be as agreed upon by purchaser and vendor for product 48 in. (1219 mm) and under in nominal width and under 0.125 in. (3.18 mm) or over 0.312 in. (9.52 mm) in nominal thickness and for product over 48 in. (1219 mm) in nominal width in all thicknesses:

3.3.1 Tensile Properties: Shall be as specified in Table I and 3.3.1.2, determined in accordance with AMS 2355; for tests at 600° F (316°C), specimens shall be heated to 600° F ± 5 (316°C ± 3), held at heat for 10 min. before testing, and tested at a rate not greater than 0.05 in. per in. per min. (0.05 mm/mm/min.) through the 0.2% offset and at a rate of 0.11 - 0.14 in. per in. per min. (0.11 - 0.14 mm/mm/min.) above the 0.2% offset:

3.3.1.1 At Room Temperature: Shall be as follows:

TABLE I

Nominal Thickness Inch	Specimen Orientation	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 2 in. or 4D %, min
0.125 to 0.312, incl	Longitudinal	34,000	25,000	4
	Long Transverse	34,000	22,000	4

TABLE I (SI)

Nominal Thickness Millimetres	Specimen Orientation	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 50 mm or 4D %, min
3.18 to 9.52, incl	Longitudinal	234	172	4
	Long Transverse	234	152	4

3.3.1.2 At 600° F (316°C): Tensile strength in both longitudinal and long transverse directions shall be not lower than 15,000 psi (103 MPa).

3.3.2 Compressive Properties: Compressive yield strength at 0.2% offset in both the longitudinal and long transverse directions shall be not lower than 20,000 psi (138 MPa), determined in accordance with ASTM E9.

3.4 Quality: The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and internal and external imperfections detrimental to usage of the product.

3.4.1 Limits for internal and external imperfections shall be as agreed upon by purchaser and vendor.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2202.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples 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 perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests.

4.3 Sampling: Shall be in accordance with AMS 2355.

4.4 Reports:

4.4.1 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. The report shall include the purchase order number, material specification number and its revision letter, size, and quantity.

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

4.5 Resampling and Retesting: Shall be in accordance with AMS 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 and temper, AMS 4383, inspection lot number, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be clearly 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 In. (152 mm) Wide: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm). The inspection lot number may appear in the row marking or may appear at only one location on the piece.

5.1.2 Flat Sheet and Plate 0.375 In. (9.52 mm) and Under Thick, 6 - 60 In. (152 - 1524 mm), Incl, Wide, and 36 - 200 In. (914 - 5080 mm), Incl, Long: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm), the rows being spaced approximately 6 in. (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 and temper and AMS 4383. The inspection lot number may be included in the rows with the alloy, temper, and specification designations or may appear at only one location on one piece.