

AEROSPACE MATERIAL SPECIFICATIONS

AMS 4390A

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave. New York 17, N.Y.

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MAGNESIUM ALLOY SHEET AND PLATE 2Th - 0.8Mn (HM21A-T8)

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Primarily for components requiring weldability and good strength-to-weight ratio up to 700 F.

3. **COMPOSITION:**

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

4. **CONDITION:**

- 4.1 **Material 0.500 In. and Under in Thickness:** Solution heat treated, cold worked, precipitation heat treated, and pickled.
- 4.2 **Material Over 0.500 In. Thick:** Solution heat treated, cold worked, and precipitation heat treated.

5. **TECHNICAL REQUIREMENTS:**

- 5.1 **Tensile Properties:** Test specimens shall conform to ASTM E8-57T except from sheet less than 3/4 in. wide, and shall be cut parallel to the direction of rolling. Elongation requirements apply only to sheet 3/4 in. and over in width.

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 6,500,000)		Elongation % in 2 in. min
		psi, min	Extension Under Load in. in 2 in.	
0.016 to 0.250, incl	33,000	18,000	0.0095	6
Over 0.250 to 0.500, incl	32,000	21,000	0.0105	6
Over 0.500 to 2.000, incl	30,000	21,000	0.0105	6

- 5.1.1 When a dispute occurs between purchaser and vendor over the yield strength value, yield strength determined by the offset method shall apply.
- 5.1.2 If sizes other than those shown are ordered, tensile property requirements shall be as agreed upon by purchaser and vendor.

Section 8.3 of the SAE Technical Board rules provides 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 attempt 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."

- 5.2 Compressive Properties: Material shall be capable of meeting the following requirements. Specimens shall be tested in the longitudinal direction in a suitable jig.

Nominal Thickness Inches	Yield Strength at 0.2% Offset psi, min
0.016 to 0.250, incl	15,000
Over 0.250 to 0.500, incl	20,000
Over 0.500 to 1.000, incl	17,000
Over 1.000 to 2.000, incl	15,000

- 5.3 Tensile Properties at 600 F: Material 0.016 to 0.250 in., excl, thick shall be capable of meeting the following requirements. Test specimens shall conform to ASTM E8-57T except from sheet less than 3/4 in. wide, and shall be cut parallel to the direction of rolling. Elongation requirements apply only to sheets 3/4 in. and over in width. Tensile test specimens shall be heated to 600 F + 5, held at 600 F + 5 for 10 min. before testing, and tested at 600 F + 5 at a rate not greater than 0.05 in. per in. per min. up to the yield strength and at a rate of 0.11 - 0.14 in. per in. per min. above the yield strength.

Tensile Strength, psi	11,000 min
Elongation, % in 2 in.	8 min

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.
7. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2202.
8. REPORTS:
- 8.1 Unless otherwise specified, 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 technical requirements of this specification. This report shall include the purchase order number, material specification number, thickness, size, and quantity.
- 8.2 Unless otherwise specified, 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, 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.
9. IDENTIFICATION: Unless otherwise specified, each sheet and plate shall be marked on one face, in the respective location indicated below. Symbols shall be applied using a suitable marking fluid and shall not be obliterated by normal handling.