AEROSPACE
MATERIAL SPECIFICATIONS

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

AMS 4390C

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MAGNESIUM ALLOY SHEET AND PLATE
2.0Th - 0.80Mn (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 (371 C).

3. COMPOSITION:

	min	max
Thorium	1.5	2.5
Manganese	0.45	1.1
Other Impurities, each	--	0.10
Other Impurities, total	--	0.30
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: When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

5.1 Tensile Properties: Test specimens shall conform to ASTM E8 and shall be taken parallel to the direction of rolling. Sheet type specimens shall be used for material less than 0.500 in. thick and ø 0.750 in. and over in width. Round specimens shall be used for material 0.500 in. and over in thickness and 0.750 in. and over in width. Material under 0.750 in. wide and under 0.500 in. thick may be tested in either full section or by use of round specimens; for such sizes, elongation requirements apply only when round specimens are used.

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. or 4D, 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 3.000, 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.

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5.2 Compressive Properties: Material shall be capable of meeting the following requirements. Specimens shall be tested in the longitudinal direction in accordance with ASTM E9.

Nominal Thickness Inches	Yield Strength at 0.2% Offset psi, min
0.063 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
Over 2.000 to 3.000, incl	14,000

5.2.1 If sizes other than those shown are ordered, compressive properties shall be as agreed upon by purchaser and vendor.

5.3 Tensile Properties at 600 F (315.6 C): Material 0.016 to 0.250 in., excl, in thickness shall be capable of meeting the following requirements. Test specimens shall conform to ASTM E8 and shall be taken parallel to the direction of rolling. Sheet type specimens shall be used for material 0.750 in. and over ø in width. Material under 0.750 in. wide shall be tested in full section; for such sizes, elongation requirements do not apply. Specimens shall be heated to 600 F ± 5 (315.6 C ± 2.8), held at heat for 10 min. before testing, and tested at 600 F ± 5 (315.6 C ± 2.8) at a rate not greater than 0.05 in. per in. per min. through the 0.2% offset and at a rate of 0.11 - 0.14 in. per in. per min. above the 0.2% offset.

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

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, smooth, and free from ø segregation and 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 ø 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 be sufficiently stable to withstand normal handling.