

AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 4384

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Revised

MAGNESIUM ALLOY SHEET HK31A-0

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for components requiring weldability and which will normally be heat treated during fabrication.
3. COMPOSITION:

Thorium	2.5 - 4.0
Zirconium	0.45 - 1.0
Other Elements, each	0.15 max
Other Elements, total	0.30 max
Magnesium	remainder

4. CONDITION: Annealed recrystallized.

5. TECHNICAL REQUIREMENTS:

- 5.1 Tensile Properties: Test specimens shall conform to ASTM E8-54T except from sheet less than $\frac{3}{4}$ in. wide and shall be cut parallel to the direction of rolling. Elongation requirements apply only to sheet $\frac{3}{4}$ in. and over in width.

Nominal Thickness Inch	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, excl	30,000	18,000	0.0096	12

- 5.1.1 The term "excl" applies only to the higher figure of the specified range.

- 5.2 Bending: Material 0.125 in. and under in thickness shall be capable of withstanding, without cracking, bending at room temperature through an angle of 90 deg around a diameter equal to the bend factor times the nominal thickness of the material with axis of bend perpendicular to direction of rolling. Unless otherwise specified, the specimen shall be approximately 1 in. wide and $\frac{1}{4}$ in. long, with the edges smooth and free from rough, sheared surfaces.

Nominal Thickness Inch	Bend Factor
0.016 to 0.063, incl	8
Over 0.063 to 0.082, incl	10
Over 0.082 to 0.125, incl	12

5.3 Properties After Heat Treatment: Material 0.016 in. to 0.250 in., excl, thick shall be capable of meeting the following requirements after being heat treated by heating to 1050 F $\pm$ 10 for 30 min. in a suitable protective atmosphere, cooling to less than 600 F within 3 min., and artificially aging at 400 F $\pm$ 5 for 14 - 18 hours.

5.3.1 Tensile Properties at 600 F: Test specimens shall conform to ASTM E8-54T 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. Unless otherwise specified, tensile test specimens shall be heated to 600 F $\pm$ 5, held at 600 F $\pm$ 5 for 10 min. before testing, and tested at 600 F $\pm$ 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	16,000 min
Elongation, % in 2 in.	16 min

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, smooth, and free from 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 the latest issue of AMS 2202 as applicable. Thickness tolerances shall conform to Table II.

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 shall be marked, in the respective location indicated below, with the manufacturer's identification and, in addition, the alloy name or number and temper, or AMS 4384, and nominal thickness in inches. The characters shall be not less than 3/8 in. in height, shall be applied using a suitable marking fluid, and shall not be obliterated by normal handling.

9.1 Flat Sheet: The alloy name or number and temper, or AMS 4384, shall be marked in rows of recurring characters from one edge to the opposite edge with rows spaced such that no piece larger than 8 in. square could be cut from the sheet without bearing the alloy identification. The manufacturer's identification and thickness shall be marked in rows not more than 20 in. apart.