

# AEROSPACE MATERIAL SPECIFICATIONS

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

## AMS 4384C

Issued 8-1-57  
Revised 2-15-65

### MAGNESIUM ALLOY SHEET AND PLATE 3.2Th - 0.70Zr (HK31A-0)

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 good formability and weldability.
3. **COMPOSITION:**

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

4. **CONDITION:**

4.1 **Material 0.500 In. and Under in Thickness:** Annealed recrystallized and pickled.

4.2 **Material Over 0.500 In. Thick:** Annealed recrystallized.

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 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<br>Inches | Tensile<br>Strength<br>psi, min | Yield Strength at 0.2% Offset<br>or at Extension Indicated<br>(E = 6,500,000) |              | Elongation<br>% in 2 in.<br>or 4D, min |
|-----------------------------|---------------------------------|-------------------------------------------------------------------------------|--------------|----------------------------------------|
|                             |                                 | psi, min                                                                      | in. in 2 in. |                                        |
| 0.016 to 0.250, incl        | 30,000                          | 18,000                                                                        | 0.0095       | 12                                     |
| Over 0.250 to 0.500, incl   | 30,000                          | 16,000                                                                        | 0.0089       | 12                                     |
| Over 0.500 to 1.000, incl   | 30,000                          | 15,000                                                                        | 0.0086       | 12                                     |
| Over 1.000 to 3.000, incl   | 29,000                          | 14,000                                                                        | 0.0083       | 12                                     |

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.

- 5.2 **Bending:** Material 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 4 in. long, with the edges smooth and free from rough, sheared surfaces.

| Nominal Thickness<br>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 **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<br>Inches | Yield Strength<br>at 0.2% Offset<br>psi, min |
|-----------------------------|----------------------------------------------|
| 0.063 to 0.250, incl        | 12,000                                       |
| Over 0.250 to 3.000, incl   | 10,000                                       |

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

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 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 be sufficiently stable to withstand normal handling.