



400 Commonwealth Drive, Warrendale, PA 15096-0001

# AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard



AMS 4388E

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Superseding AMS 4388D

## MAGNESIUM ALLOY EXTRUSIONS 3.0Th - 1.5Mn (HM31A-F) As Extruded

UNS M13312

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of February 1996. It is recommended, therefore, that this specification not be specified for new designs.

This cover sheet should be attached to the "D" revision of the subject specification.

"NONCURRENT" refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these "NONCURRENT" specifications is available from SAE upon request.

PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "D"

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**MAGNESIUM ALLOY EXTRUSIONS**  
**3.0Th - 1.5Mn (HM31A-F)**  
**As Extruded**

UNS M13312

1. SCOPE:

- 1.1 Form: This specification covers a magnesium alloy in the form of extruded bars, rods, wire, and shapes.
- 1.2 Application: Primarily for components requiring weldability and good strength-to-weight ratio up to 600°F (316°C).
- 1.3 Precautions: Alloy 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.
- 1.4 Safety - Hazardous Materials: While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.
2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.
- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

**REAFFIRMED**

**APR '94**

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2.1.1 Aerospace Material Specifications:

- AMS 2205 - Tolerances, Aluminum Alloy and Magnesium Alloy Extrusions  
 MAM 2205 - Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Extrusions  
 AMS 2350 - Standards and Test Methods  
 AMS 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products Except Forging Stock) and Flash Welded Rings  
 MAM 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B660 - Packaging/Packing of Aluminum and Magnesium Products

3. TECHNICAL REQUIREMENTS:3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS 2355 or MAM 2355:

	min	max
Thorium	2.5	-3.5
Manganese	1.2	--
Residual Elements, each	--	0.10
Residual Elements, total	--	0.30
Magnesium	remainder	

3.2 Condition: As extruded.

## 3.2.1 Extrusions shall be supplied with an as-extruded surface finish; light polishing to remove minor surface imperfections is permissible provided such imperfections can be removed within the dimensional tolerances of 3.5.

3.3 Properties: Extrusions shall conform to the following requirements:3.3.1 Tensile Properties: Shall be as follows, determined in accordance with AMS 2355 or MAM 2355:3.3.1.1 Bars, Rods, Wire, and Solid Shapes Under 4 Square Inches (26 cm<sup>2</sup>) in Cross-Sectional Area:

Tensile Strength, minimum	37,000 psi (255 MPa)
Yield Strength at 0.2% Offset, minimum	26,000 psi (179 MPa)
Elongation in 4D, minimum	4 %

3.3.1.2 Bars, Rods, Wire, and Solid Shapes 4 Square Inches (26 cm<sup>2</sup>) and Over in Cross-Sectional Area and Hollow Shapes: Shall be as agreed upon by purchaser and vendor.

3.4 Quality: Extrusions, as received by purchaser, shall be uniform in quality and condition, sound, and free from segregation and foreign materials and from imperfections detrimental to usage of the extrusions.

3.5 Tolerances: Shall conform to all applicable requirements of AMS 2205 or MAM 2205.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of extrusions shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the extrusions conform 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 and shall be performed on each lot.

4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2355.

4.4 Reports:

4.4.1 The vendor of extrusions shall furnish with each shipment a report stating that the extrusions conform to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, AMS 4388D, size or section identification number, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 4388D, contractor or other direct supplier of extrusions, part number, and quantity. When extrusions for making parts are produced or purchased by the parts vendor, that vendor shall inspect each lot of extrusions to determine conformance to the requirements of this specification and shall include in the report either a statement that the extrusions conform or copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting: Shall be in accordance with AMS 2355 or MAM 2355.