Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4350J
Superseding AMS 4350H
Issued 1-22-40
Revised 7-15-78

MAGNESIUM ALLOY EXTRUSIONS
6.5Al - 1.0Zn (AZ61A-F)

1. SCOPE:

1.1 Form: This specification covers a magnesium alloy in the form of extruded bars, rods, wire, shapes, and tubing.

1.2 Application: Primarily for low-strength parts requiring rigidity and low density. Special care is necessary to prevent corrosion.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

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

2.2 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.2.1 Military Standards:

MIL-STD-649 - Aluminum and Magnesium Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined in accordance ø with AMS 2355:

	min	max
Aluminum	5.8	7.2
Zinc	0.40	1.5
Manganese	0.15	--
Silicon	--	0.05
Copper	--	0.05
Nickel	--	0.005
Iron	--	0.005
Other Impurities, 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.

3.3 Properties: Extrusions shall conform to the following requirements, determined in accordance with Ø AMS 2355:

3.3.1 Tensile Properties: Shall be as specified in Table I.

TABLE I

Nominal Diameter or Least Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 4D %, min
Solid Shapes			
Up to 0.250, excl	38,000	21,000	8
0.250 to 2.499, incl	40,000	24,000	9
Over 2.499 to 4.999, incl but not over 25 sq in. Cross Sectional Area	40,000	22,000	7
Hollow and Semi-Hollow Shapes			
All Wall Thicknesses	36,000	16,000	7
Tubing			
0.028 to 0.750, incl, in Wall Thickness, 6.000 max OD	36,000	16,000	7

TABLE I (SI)

Nominal Diameter or Least Thickness Millimetres	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 4D %, min
Solid Shapes			
Up to 6.35, excl	262	145	8
6.35 to 63.47, incl	276	165	9
Over 63.47 to 126.97, incl but not over 161 cm^2 Cross Sectional Area	276	152	7
Hollow and Semi-Hollow Shapes			
All Wall Thicknesses	248	110	7
Tubing			
0.71 to 19.05, incl, in Wall Thickness 152.40 max OD	248	110	7

3.3.2 Hardness: Should be not lower than 50 HB/10/500, 50 HB/14.3/1000, or 57 HB/10/1000 but the extrusions shall not be rejected on the basis of hardness if the tensile property requirements are met.

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

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2205.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of extrusions shall supply all samples and shall be re- Ø sponsible 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 perform such confirmatory testing as he deems necessary to ensure that the extrusions conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to composition (3.1), tensile property (3.3.1), Ø and tolerance (3.5) requirements are classified as acceptance tests.

4.2.2 Periodic Tests: Tests to determine conformance to hardness (3.3.2) requirements are classified Ø as periodic tests.

4.3 Sampling: Shall be in accordance with AMS 2355; frequency and extent of sampling for periodic tests Ø shall be as agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 The vendor of extrusions shall furnish with each shipment three copies of 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, material specification number and its revision letter, size or section identification number, and quantity.

4.4.2 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 and its revision letter, 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 a statement that the extrusions conform, or shall include copies of laboratory reports showing the results of tests to determine conformance.

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

5. PREPARATION FOR DELIVERY:

5.1 Identification: Extrusions shall be identified as follows:

5.1.1 Each straight bar, rod, and tube 0.500 in. (12.70 mm) and over in nominal OD or least width of flat surface and each straight shape with configuration allowing access to a flat surface at least 0.500 in. (12.70 mm) wide recessed not more than 1/8 in. (3 mm) below the outline of the shape shall be marked in a row of characters recurring at intervals not greater than 3 ft (914 mm) with the alloy number and temper, AMS 4350 or applicable Federal or Military specification designation, and manufacturer's identification. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling. The markings shall have no deleterious effect on the extrusions or their performance.

5.1.2 All straight extrusions other than those of 5.1.1 shall be securely bundled, boxed, or secured on lifts and identified by two durable tags, marked with the information of 5.1.1 and attached, not farther than 2 ft (610 mm) from each end, to the extrusions in each bundle, box, or lift.

5.1.3 Coiled bar, rod, wire, and tubing and spooled wire shall be identified with the information of Ø 5.1.1 marked on a durable tag attached to each coil or directly on one flange of each spool.

5.2 Protective Treatment: Extrusions shall be oiled, prior to shipment, with a light corrosion-inhibiting oil.

5.3 Packaging:

5.3.1 Extrusions shall be prepared for shipment in accordance with commercial practice and in compliance Ø with applicable rules and regulations pertaining to the handling, packaging, and transportation of the extrusions to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.3.2 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-649, Ø Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.3.1 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.