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

AEROSPACE MATERIAL SPECIFICATION

AMS 4342

Issued 4-15-78
Revised

ALUMINUM ALLOY EXTRUSIONS
6.2Zn - 2.3Cu - 2.2Mg - 0.12Zr (7050-T736511)

1. SCOPE:

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

1.2 Application: Primarily for structural applications requiring high mechanical properties and good resistance to stress-corrosion cracking.

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

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

ASTM G34 - Exfoliation Corrosion Susceptibility in 7XXX Series Copper-Containing Aluminum Alloys (EXCO Test)
ASTM G47 - Determining Susceptibility to Stress Corrosion Cracking of High Strength 7XXX Aluminum Alloy Products

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

2.3.1 Military Specifications:

MIL-H-6088 - Heat Treatment of Aluminum Alloys

2.3.2 Military Standards:

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

Printed in U.S.A.

3. TECHNICAL REQUIREMENTS:

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

	min	max
Zinc	5.7	6.7
Copper	2.0	2.6
Magnesium	1.9	2.6
Zirconium	0.08	0.15
Iron	--	0.15
Silicon	--	0.12
Manganese	--	0.10
Titanium	--	0.06
Chromium	--	0.04
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition: Solution heat treated, stress-relieved by stretching to produce a nominal permanent set of 1.5%, but not less than 1% nor more than 3%, and precipitation heat treated.

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.

3.2.2 The product may receive minor straightening, after stretching, of an amount necessary to meet the requirements of 3.6.

3.3 Heat Treatment: Shall be performed as follows, using equipment and exercising controls specified in MIL-H-6088:

3.3.1 Solution Heat Treatment: Heat to 890°F ± 10 (477°C ± 6), hold at heat for a time commensurate with thickness but not less than 15 min., and quench in agitated water at a temperature not higher than 100°F (38°C).

3.3.2 Precipitation Heat Treatment: Heat to 250°F ± 10 (121°C ± 6), hold at heat for 1 - 24 hr, further heat to 350°F ± 10 (177°C ± 6), hold at heat for 10 hr ± 1, and cool in air.

3.4 Properties: Extrusions less than 3.000 in. (76.20 mm) in nominal diameter or thickness (wall thickness of tubing) and 20 sq in. (129 cm^2) and under in cross-sectional area and from 3.000 in. (76.20 mm) to 5.000 in. (127.00 mm), incl, in nominal diameter or thickness and 32 sq in. (206 cm^2) and under in cross-sectional area shall conform to the following requirements, determined in accordance with AMS 2355; requirements for sizes over these limits shall be as agreed upon by purchaser and vendor:

3.4.1 Tensile Properties: Shall be as follows, determined on specimens taken in the longitudinal direction:

Tensile Strength, min	73,000 psi (503 MPa)
Yield Strength at 0.2% Offset, min	63,000 psi (434 MPa)
Elongation in 2 in. (50 mm) or 4D, min	7%

3.4.2 Conductivity: Shall be not lower than 40% IACS (International Annealed Copper Standard).

3.4.3 Exfoliation-Corrosion Resistance: Extrusions processed to meet the requirements of 3.4.1 and 3.4.2 shall show a level of exfoliation-corrosion at any plane less than that illustrated in Photo B, Fig. 2, of ASTM G34.

3.4.4 Stress-Corrosion Resistance: Extrusions, processed to meet the requirements of 3.4.1 and stressed in the transverse direction (short transverse direction, if possible) to 31,500 psi (217 MPa) for nominal thickness 3.000 in. (76.20 mm) and under and to 35,000 psi (241 MPa) for nominal thicknesses over 3.000 in. (76.20 mm) shall meet the requirements of ASTM G47.

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

3.6 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 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 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 (3.4.1), conductivity (3.4.2), and tolerance (3.6) requirements are classified as acceptance tests.

4.2.2 Periodic Tests: Tests to determine conformance to exfoliation-corrosion resistance (3.4.3) and stress-corrosion resistance (3.4.4) requirements are classified as periodic tests.

4.3 Sampling: Shall be in accordance with AMS 2355. Frequency and extent of sampling for periodic tests 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, 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, 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 result of tests to determine conformance.

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: