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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4342B

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Superseding AMS 4342A

Submitted for recognition as an American National Standard

ALUMINUM ALLOY EXTRUSIONS
6.2Zn - 2.3Cu - 2.2Mg - 0.12Zr (7050-T74511) Formerly -T736511)
Solution Heat Treated, Stress Relieved, and Overaged

UNS A97050

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:

This product has been used typically for structural applications requiring a combination of high mechanical properties and good resistance to stress-corrosion cracking but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2205 Tolerances, Aluminum Alloy and Magnesium Alloy Extrusions
MAM 2205 Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Extrusions
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
AMS 2750 Pyrometry
AMS 2811 Identification, Aluminum and Magnesium Alloy Wrought Products

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 594 Ultrasonic Inspection of Aluminum-Alloy Products for Aerospace Applications
ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products
ASTM G 34 Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)

2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

(R) Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS 2355 or MAM 2355.

TABLE 1 - Composition

Element	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 overaged.

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

3.3 Heat Treatment:
(R)

Shall be performed as follows; pyrometry shall be in accordance with AMS 2750.

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

3.3.2 Overaging Heat Treatment: No specific heat treatment is specified but it is recommended that extrusions be overaged by heating to 250 °F ± 10 (121 °C ± 6), holding at heat for 1 - 24 hours, further heating to 350 °F ± 10 (177 °C ± 6), holding at heat for 10 hours ± 1, and cooling in air.

3.4 Properties:

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

3.4.1 Tensile Properties: Shall be as specified in Table 2, determined on specimens taken in the longitudinal direction:

TABLE 2 - Tensile Properties

Property	Minimum
Tensile Strength	73.0 ksi (503 MPa)
Yield Strength at 0.2% Offset	63.0 ksi (434 MPa)
Elongation in 4D	7%
Elongation in 5D	6%

3.4.2 Corrosion Resistance: Resistance to stress-corrosion cracking and to exfoliation corrosion shall be acceptable if the extrusions conform to the requirements of 3.4.2.1 and 3.4.2.2.

3.4.2.1 Electrical Conductivity: Shall be not lower than 38.0% IACS
(R) (International Annealed Copper Standard) (22.0 MS/m), determined on the surface of the test coupon prior to turning.

3.4.2.2 Stress-Corrosion Susceptibility Factor: Shall be not greater than 32.0 (220), determined by subtracting the electrical conductivity, AA.A% IACS (12 x BB.B MS/m) from the longitudinal yield strength, XX.X ksi (YYY MPa).

Examples:

Inch/Pound Units	68.2 ksi - 38.1% IACS = 30.1	Acceptable
	71.5 ksi - 38.2% IACS = 33.3	Unacceptable
SI Units	470 MPa - 12 x 22 MS/m - 206	Acceptable
	493 MPa - 12 x 22 MS/m = 229	Unacceptable

3.4.2.3 (R) Extrusions not conforming to 3.4.2.1 and 3.4.2.2 are not acceptable and may be given additional overaging heat treatment. If, upon completion of such treatment, extrusions conform to 3.4.2.1 and 3.4.2.2, they are acceptable.

3.4.3 Exfoliation Corrosion Resistance: Specimens cut from extrusions shall exhibit exfoliation corrosion, at a T/10 plane, not greater than that illustrated by Photo B, Figure 2, of ASTM G 34.

3.4.4 Stress-Corrosion Resistance: Specimens, cut from extrusions 0.750 inch (19.05 mm) and over in nominal thickness, shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction at 35.0 ksi (241 MPa).

3.5 Quality:

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

3.5.1 When specified, each bar, rod, tube, and shape shall be subjected to ultrasonic inspection in accordance with ASTM B 594 and shall meet the following requirements:

3.5.1.1 Each bar, rod, and shape weighing 600 pounds (272 kg) and under and having a maximum width-to-thickness ratio of 10:1 shall meet the following ultrasonic class requirements:

Nominal Thickness		Ultrasonic Class
Inches	Millimeters	
0.500 - 1.500, excl	12.70 - 38.10, excl	B
1.500 and over	38.10 and over	A

3.5.1.2 (R) The ultrasonic class for all tubing and for other extrusions under 0.500 inch (12.70 mm) in nominal thickness, weighing over 600 pounds (272 kg), or in excess of 10:1 maximum width-to-thickness ratio shall be as agreed upon by purchaser and vendor.