



AEROSPACE MATERIAL SPECIFICATION

AMS4336

REV. A

Issued 2002-03
Revised 2003-06
Reaffirmed 2013-12

Superseding AMS4336

Aluminum Alloy, Extruded Rod, Bar, and Profiles (7055-T76511)
8.0Zn - 2.3Cu - 2.0Mg - 0.16Zr
Solution Heat Treated, Stress-Relieved, and Overaged
(Composition similar to UNS A97055)

RATIONALE

AMS4336A has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy procured in the form of extruded bars, rods, and profiles (shapes) with cross-sectional area of 12 square inches (77 cm²) maximum and circle size of 10 inches (254 mm) maximum.

1.2 Application:

These extrusions have been used typically for structural applications requiring a combination of high tensile and compressive strength and good exfoliation corrosion resistance, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

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SAE WEB ADDRESS:

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock and Rolled, Forged, or Flash Welded Rings
MAM 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units
AMS 2772	Heat Treatment of Aluminum Alloy Raw Materials
AS1990	Aluminum Alloy Tempers

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B666M	Identification Marking of Aluminum and Magnesium Products
ASTM E 1004	Method for Electromagnetic (Eddy Current) Measurements of Electrical Conductivity
ASTM G 34	Exfoliation Corrosion Susceptibility in 2xxx and 7xxx Series Aluminum Alloys (EXCO Test)

2.3 ANSI Publications:

Available from ANSI, 25 West 43rd Street, New York, NY 10036 or www.ansi.org.

ANSI H35.2	Dimensional Tolerances for Aluminum Mill Products
ANSI H35.2M	Dimensional Tolerances for Aluminum Mill Products (Metric)

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

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
Silicon	--	0.10
Iron	--	0.15
Copper	2.0	2.6
Manganese	--	0.05
Magnesium	1.8	2.3
Chromium	--	0.04
Zinc	7.6	8.4
Titanium	--	0.06
Zirconium	0.08	0.25
Other Elements, each	--	0.05
Other Elements, 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 to the T76511 temper (See AS1990).

3.2.1 Product shall be supplied with an as-extruded surface finish; light polishing to remove minor surface conditions is permissible provided such conditions can be removed within specified dimensional tolerances.

3.2.2 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 in accordance with AMS 2772 and as follows:

3.3.1 Overaging Heat Treatment: Heat to 240 to 250 °F (116 to 121 °C), hold at temperature for a time of 4 to 6 hours, then heat to 310 to 320 °F (154 to 160 °C), hold at temperature for a time of 6.5 to 7.5 hours, and air cool.

3.4 Properties:

Extrusions shall conform to the following requirements, determined on the mill produced size in accordance with AMS 2355 or MAM 2355:

3.4.1 Longitudinal tensile properties of extrusions with a maximum cross-sectional area of 12 square inches (77 cm²) and a maximum circle size of 10 inches (254 mm) shall be as shown in Table 2.

TABLE 2A - Minimum Longitudinal Tensile Properties, Inch/Pound Units

Nominal Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 inches or 4D %
Up to 0.249, incl	89.0	85.0	7
Over 0.249 to 0.499, incl	90.0	85.0	9
Over 0.499 to 3.000, incl	91.0	86.0	9

TABLE 2B - Minimum Longitudinal Tensile Properties, SI Units

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Up to 6.34, incl	614	586	7
Over 6.34 to 12.68, incl	621	586	9
Over 12.68 to 76.20, incl	627	593	9

- 3.4.2 Longitudinal compression yield strength shall be as shown in Table 3.

TABLE 3A - Minimum Longitudinal Compressive Yield Strength, Inch/Pound Units

Nominal Diameter or Least Thickness (bars, rods, profiles) Inches	Longitudinal Compressive Yield Strength ksi
Over 0.499 to 3.000, incl	87.0

TABLE 3B - Minimum Longitudinal Compressive Yield Strength, SI Units

Nominal Diameter or Least Thickness (bars, rods, profiles) Inches	Longitudinal Compressive Yield Strength ksi
Over 12.68 to 76.20, incl	600

- 3.4.3 Electrical Conductivity (EC): Shall be not lower than 35.0% IACS (International Annealed Copper Standard) (20.9 MS/m), in accordance with ASTM E 1004, determined on the surface of the test coupon prior to turning.
- 3.4.4 Exfoliation Corrosion Resistance: Specimens cut from extrusions shall not exhibit exfoliation corrosion at a T/10 plane greater than that illustrated by Photograph B, Figure 2, of ASTM G 34.

3.5 Quality:

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

- 3.5.1 Intergranular Attack (IGA): No IGA is permitted on sections up to 0.450 inch (11.43 mm) thick. IGA, if found during visual inspection, shall be removed by suitable means (machining, sanding, etc.) (See 8.2).

3.6 Tolerances:

Shall conform to all applicable requirements of ANSI H35.2 or ANSI H35.2M.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the products conform to specified requirements.

4.2 Classification of Tests:

- 4.2.1 Acceptance Tests: Composition (3.1), tensile properties (3.4.1), electrical conductivity (3.4.3), and tolerances (3.6) are acceptance tests and, except for composition, shall be performed on each inspection lot.
- 4.2.2 Periodic Tests: Compression yield strength (3.4.2) and exfoliation corrosion resistance (3.4.4) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2355 or MAM 2355.

4.4 Reports:

The vendor of product shall furnish with each shipment a report stating that the product conforms to the chemical composition and tolerances and showing the numerical results of tests on each inspection lot to determine conformance to the other acceptance test requirements. This report shall include the purchase order number, inspection lot number(s), AMS 4336A, size or section identification number, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.