AEROSPACE MATERIAL SPECIFICATION

AMS4340™	REV. H

Issued 1997-01
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Revised 2024-05

Superseding AMS4340G

Aluminum Alloy, Extrusions
6.2Zn - 2.3Cu - 2.2Mg - 0.12Zr (7050-T76511)
Solution Heat Treated, Stress Relieved, Straightened, and Overaged
(Composition similar to UNS A97050)

RATIONALE

AMS4340H results from a Five-Year Review and update of this specification with changes to add provisions for use of AS6279 (see 3.7), remove obsolete weight criteria for ultrasonic testing (see Table 3), update wording to prohibit unauthorized exceptions (see 3.3.1.1, 3.6, and 8.4), update Applicable Documents (see Section 2), and relocate Definitions (see 2.4) and allow the use of the immediate prior specification revision (see 8.3).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of extruded bars, rods, wire, profiles, and tubing up to 5.000 inches (127.00 mm), inclusive, in nominal diameter or least thickness (see 8.5).

1.2 Application

These products have been used typically for structural applications requiring high tensile properties 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 cancelled and no superseding document has been specified, the last published issue of that document shall apply.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
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SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4340H/

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2355 Quality Assurance, Sampling and Testing, Aluminum Alloys and Magnesium Alloy, Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings

AMS2772 Heat Treatment of Aluminum Alloy Raw Materials

AS6279 Standard Practice for Production, Distribution, and Procurement of Metal Stock

AS7766 Terms Used in Aerospace Materials Specifications

2.2 ANSI Accredited Publications

Copies of these documents are available online at https://webstore.ansi.org/.

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

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

2.3 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B594 Ultrasonic Inspection of Aluminum-Alloy Wrought Products

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

ASTM G34 Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)

ASTM G47 Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products

2.4 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS2355.

Table 1 - Composition

Element	Min	Max
Silicon	--	0.12
Iron	--	0.15
Copper	2.0	2.6
Manganese	--	0.10
Magnesium	1.9	2.6
Chromium	--	0.04
Zinc	5.7	6.7
Titanium	--	0.06
Zirconium	0.08	0.15
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. Solution and overaging heat treatments shall be performed in accordance with AMS2772.

3.2.1 The product may receive minor straightening, after stretching, of an amount necessary to meet the requirements of 3.5.

3.2.2 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 specified dimensional tolerances.

3.3 Properties

Extrusions, 5.000 inches (127.00 mm) and under in nominal diameter or thickness (wall thickness of tubing) shall conform to the following requirements, determined in accordance with AMS2355 on the mill produced size.

3.3.1 Tensile Properties

Shall be as shown in Table 2 for specimens taken in the longitudinal direction.

Table 2A - Minimum longitudinal tensile properties, inch/pound units

Nominal Diameter or Least Thickness (Wall Thickness of Tubing) Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
Up to 0.499, incl	77.0	68.0	7
Over 0.499 to 5.000, incl	79.0	69.0	7

Table 2B - Minimum longitudinal tensile properties, SI units

Nominal Diameter or Least Thickness (Wall Thickness of Tubing) Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Up to 12.67, incl	531	469	7
Over 12.67 to 127.00, incl	545	476	7

3.3.1.1 Mechanical property requirements for product outside of the range covered by 1.1 shall be agreed upon between the purchaser and producer and reported per 4.4.1 (see 8.5).

3.3.2 Corrosion Resistance

Resistance to stress-corrosion cracking and to exfoliation-corrosion shall be acceptable if extrusions conform to the requirements of 3.3.2.1 and 3.3.2.2.

3.3.2.1 Electrical Conductivity

Shall be 39.0% International Annealed Copper Standard (IACS) (22.6 MS/m) or greater.

3.3.2.2 Stress-Corrosion Susceptibility Factor (SCF)

If electrical conductivity is 37.0 to 38.9% IACS (21.5 to 22.6 MS/m), the SCF shall be not greater than 39.0 (270), determined by subtracting the electrical conductivity (AA.A IACS [12 times BB.B MS/m]) from the longitudinal yield strength (XX.X ksi [YYY MPa]).

EXAMPLES: Inch/Pound Units: 78.0 ksi - 37.5% IACS = 40.5, Unacceptable
74.0 ksi - 38.5% IACS = 35.5, Acceptable

SI Units: 538 MPa - (12 × 21.8 MS/m) = 276, Unacceptable
510 MPa - (12 × 22.3 MS/m) = 242, Acceptable

3.3.2.3 Extrusions not conforming to 3.3.2.1 or 3.3.2.2 may be given additional overaging heat treatment and retested to determine conformance to 3.3.1 and 3.3.2.1 or 3.3.2.2.

3.3.3 Exfoliation-Corrosion Resistance

Specimens, cut from extrusions and tested per ASTM G34, shall not exhibit exfoliation corrosion, at a T/10 plane, greater than that illustrated by photograph EB, Figure 2, of ASTM G34.

3.3.4 Stress-Corrosion Resistance

Specimens, cut from extrusions 0.750 inch (19.05 mm) and over in nominal diameter or least thickness, shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction at 17.0 ksi (117 MPa) per ASTM G47.

3.4 Quality

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

3.4.1 When specified, each bar, rod, and profile not exceeding a 10 to 1 width to thickness ratio shall be subjected to ultrasonic inspection in accordance with ASTM B594 and shall meet the requirements shown in Table 3.

Table 3A - Ultrasonic requirements, inch/pound units

Nominal Thickness Inches	Discontinuity Class
0.500 to 1.500, excl	B
1.500 to 5.000, incl	A

Table 3B - Ultrasonic requirements, SI units

Nominal Thickness Millimeters	Discontinuity Class
12.70 to 38.10, excl	B
38.10 to 127.00, incl	A