AEROSPACE MATERIAL SPECIFICATION

AMS4332™	REV. B

Issued 2005-01
Reaffirmed 2012-04
Revised 2025-03

Superseding AMS4332A

Aluminum Alloy, Extruded Profiles (7349-T76511),
8.1Zn - 1.7Cu - 2.2Mg - 0.16Zr,
Solution Heat Treated, Stress-Relieved, and Overaged
(Composition similar to UNS A97349)

RATIONALE

AMS4332B results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (see 3.4.1.1, 3.7, and 8.5), relocate Definitions (see 2.4), correct thickness ranges (see Table 2), and update Applicable Documents (see Section 2).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy procured in the form of extruded profiles (shapes) with cross sections up to 0.750 inch (19.05 mm) (see 8.6).

1.2 Application

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

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

AS7766 Terms Used in Aerospace Metals Specifications

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4332B/

2.2 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 B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

ASTM E1004 Determining Electrical Conductivity Using the Electromagnetic (Eddy Current) Method

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

2.3 ANSI Accredited Publications

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

ANSI H35.1/ H35.1M Standard Alloy and Temper Designation System For Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

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

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	1.4	2.1
Manganese	--	0.20
Magnesium	1.8	2.7
Chromium	0.10	0.22
Zinc	7.5	8.7
Titanium	--	0.06
Zirconium + Titanium	--	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 (refer to ANSI H35.1/H35.1M).

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 AMS2772 and as follows:

3.3.1 Solution Heat Treatment

Profiles shall be solution heat treated by heating to 870 to 890 °F (466 to 477 °C), holding at heat for a time commensurate with section thickness, and rapid cooling in a suitable quenching medium.

3.3.2 Overaging Heat Treatment

Heat to 242 to 253 °F (117 to 123 °C), hold at temperature for a time of 10 to 14 hours, then heat to 307 to 318 °F (153 to 159 °C), hold at temperature for a time of 10 to 12 hours, and air cool.

3.4 Properties

Extrusions shall conform to the following requirements, determined on the mill-produced size in accordance with AMS2355:

3.4.1 Longitudinal tensile properties of extrusions with a maximum cross-section dimension up to 0.750 inch (19.05 mm) shall be as shown in Table 2.

3.4.1.1 Mechanical property requirements for extrusions outside the size range of 1.1 shall be as agreed upon by the purchaser and producer and reported per 4.4.1 (see 8.6).

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	91.0	84.0	8
0.250 to 0.500, incl	92.0	84.0	7
Over 0.500 to 0.750, incl	94.0	87.0	6

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 6.33, incl	627	579	8
6.35 to 12.68, incl	634	579	7
Over 12.68 to 19.05, incl	648	600	6

3.4.2 Electrical Conductivity (EC)

Shall be not lower than 35.0% IACS (International Annealed Copper Standard) (20.3 MS/m), in accordance with ASTM E1004, determined on the surface of the test coupon prior to machining.

3.4.3 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 G34.

3.5 Quality

Product, as received by the 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.) as long as no minimum section dimensions are violated (see 8.2).

3.6 Tolerances

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

3.7 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The 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 (see 3.1), tensile properties (see 3.4.1), electrical conductivity (see 3.4.2), inspection for intergranular attack (see 3.5.1), and tolerances (see 3.6) are acceptance tests and, except for composition, shall be performed on each inspection lot.

4.2.2 Periodic Tests

Exfoliation-corrosion resistance (see 3.4.3) is a periodic test and shall be performed at a frequency selected by the producer unless frequency of testing is specified by the purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.

4.4 Reports

The producer of product shall furnish with each shipment a report stating that the product conforms to the 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), AMS4332B, size or section identification number, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.4.1 When material produced to this specification is beyond the sizes allowed in the scope or tables, or other exceptions are taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement “This material is certified as AMS4332B(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

4.5 Resampling and Retesting

Shall be in accordance with AMS2355.