AEROSPACE MATERIAL SPECIFICATION

AMS4352™	REV. K

Issued 1951-10
Reaffirmed 2008-11
Revised 2024-05

Superseding AMS4352J

Magnesium Alloy, Extrusions, 5.5Zn - 0.45Zr (ZK60A-T5), Precipitation Heat Treated

(Composition similar to UNS M16600)

RATIONALE

AMS4352K results from a Five-Year Review and update of this specification with changes to update general agreement wording to prohibit unauthorized exceptions (see 3.4, 3.7, and 8.4), relocate Definitions (see 2.4), update Applicable Documents (see Section 2), and allow the use of the immediate prior specification revision (see 8.3).

1. SCOPE

1.1 Form

This specification covers a magnesium alloy in the form of extruded bars, rods, wire, tubing, and profiles up to 40 square inches (258 cm^2) in cross-sectional area (solids) and up to 8.5 inches (216 mm) OD by 1.188 inches (30.18 mm) wall thickness (tubing) (see 8.5).

1.2 Application

These extrusions have been used typically for parts requiring toughness and moderate abrasion 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
AMS2750	Pyrometry

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/AMS4352K/

AS7766 Terms Used in Aerospace Metals Specifications

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 B666/B666M Identification Marking of Aluminum and Magnesium Products

ASTM E9 Compression Testing of Metallic Materials at Room Temperature

2.3 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)

2.4 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
Zinc	4.8	6.2
Zirconium	0.45	1.0
Impurities, each (see 3.1.1)	--	0.10
Impurities, total (see 3.1.1)	--	0.30
Magnesium	remainder	

3.1.1 Determination not required for routine acceptance.

3.2 Condition

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 specified dimensional tolerances.

3.3 Heat Treatment

Extrusions shall be precipitation heat treated by heating to 300 °F ± 15 °F (149 °C ± 8 °C), holding at heat for not less than 24 hours, and cooling in air. Pyrometry shall be in accordance with AMS2750.

3.4 Properties

Extrusions shall conform to the requirements of 3.4.1 and 3.4.2. Mechanical property requirements for product outside of the ranges covered by 1.1 shall be agreed upon between the purchaser and producer and reported per 4.4.1 (see 8.5).

3.4.1 Tensile Properties

Shall be as specified in 3.4.1.1, 3.4.1.2, and 3.4.1.3, determined in accordance with AMS2355.

3.4.1.1 Bars, Rods, Wire, and Solid Profiles

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

Nominal Cross-Sectional Area Square Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D %
Up to 5, excl	45.0	36.0	4
5 to 25, excl	45.0	34.0	6
25 to 40, excl	43.0	31.0	6

Table 2B - Minimum tensile properties, SI units

Nominal Cross-Sectional Area Square Centimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 4D %
Up to 32, excl	310	248	4
32 to 161, excl	310	234	6
161 to 258, excl	296	214	6

3.4.1.2 Tubing

Table 3A - Minimum tensile properties, inch/pound units

Nominal OD Inches	Nominal Wall Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
Up to 3.0, incl	0.028 to 0.250, incl	46.0	38.0	4
Over 3.0 to 8.5, incl	0.094 to 1.188, incl	44.0	33.0	4

Table 3B - Minimum tensile properties, SI units

Nominal OD Millimeters	Nominal Wall Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Up to 76, incl	0.71 to 6.35, incl	317	262	4
Over 76 to 216, incl	2.39 to 30.18, incl	303	228	4

3.4.1.3 Hollow Profiles

Table 4 - Minimum tensile properties

Property	Value
Tensile Strength	46.0 ksi (317 MPa)
Yield Strength at 0.2% Offset	38.0 ksi (262 MPa)
Elongation in 2 Inches (50.8 mm) or 4D	4%

3.4.2 Compressive Properties

Shall be as specified in 3.4.2.1, 3.4.2.2, and 3.4.2.3, determined in accordance with ASTM E9 on specimens taken in the longitudinal direction.

3.4.2.1 Bars, Rods, and Solid Profiles

Table 5A - Minimum compressive properties, inch/pound units

Nominal Cross-Sectional Area Square Inches	Yield Strength at 0.2% Offset ksi
Up to 2, excl	30.0
2 to 3, excl	28.0
3 to 5, excl	25.0
5 to 10, excl	23.0
10 to 25, excl	22.0
25 to 40, excl	22.0

Table 5B - Minimum compressive properties, SI units

Nominal Cross-Sectional Area Square Centimeters	Yield Strength at 0.2% Offset MPa
Up to 13, excl	207
13 to 19, excl	193
19 to 32, excl	172
32 to 64, excl	159
64 to 161, excl	152
161 to 258, excl	138

3.4.2.2 Tubing

Table 6A - Minimum compressive properties, inch/pound units

Nominal OD Inches	Nominal Wall Thickness Inches	Yield Strength at 0.2% Offset ksi
Up to 3.0, incl	0.028 to 0.250, incl	26.0
Over 3.0 to 8.5, incl	0.094 to 1.188, incl	21.0

Table 6B - Minimum compressive properties, SI units

Nominal OD Millimeters	Nominal Wall Thickness Millimeters	Yield Strength at 0.2% Offset ksi
Up to 76, incl	0.71 to 6.35, incl	179
Over 76 to 216, incl	2.39 to 30.18, incl	145

3.4.2.3 Hollow Profiles

Table 7 - Minimum compressive properties

Requirement	Value
Yield Strength at 0.2% Offset	26.0 ksi (179 MPa)

3.5 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.