# AEROSPACE MATERIAL SPECIFICATION

| AMS4342™ | REV. G |
|---|---|

Issued 1978-04
Reaffirmed 2017-11
Revised 2023-09

Superseding AMS4342F

## Aluminum Alloy, Extrusions
## 6.2Zn - 2.3Cu - 2.2Mg - 0.12Zr (7050-T74511)
## Solution Heat Treated, Stress Relieved, Straightened, and Overaged
## (Composition similar to UNS A97050)

RATIONALE

AMS4342G results from a Five-Year Review and update of this specification with changes to to add provisions for AS6279 (see 3.7), update wording to prohibit unauthorized exceptions (see 3.3.1.1, 3.6, and 8.4), relocate Definitions (see 2.4), update Applicable Documents (see Section 2), and remove weight criteria from Ultrasonic Inspection (see 3.4.1.1).



1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of extruded bars, rods, wire, profiles 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 (see 8.5).

1.2 Application

These products have 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 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 |



**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/AMS4342G/

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

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 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)

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 H 35.2 Dimensional Tolerances for Aluminum Mill Products

ANSI H 35.2M 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 | 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 T74511 temper in accordance with AMS2772 as applicable to extrusions (refer to ANSI H35.1/H35.1M).

3.2.1 Extrusions 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, 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 AMS2355 on the mill produced size.

3.3.1 Tensile Properties

Shall be as shown in Table 2, determined on specimens taken in the longitudinal direction.

***Table 2 - Minimum longitudinal tensile properties***

| Property | Value |
|---|---|
| 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% |

3.3.1.1 Mechanical property requirements for product outside the range covered by 1.1 shall be as agreed upon by 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 the extrusions conform to the requirements of 3.3.2.1 and 3.3.2.2.

3.3.2.1 Electrical Conductivity

Shall be not lower than 38.0% International Annealed Copper Standard (IACS) (22.0 MS/m), determined on the surface of the test coupon prior to machining of the tensile specimens.

3.3.2.2 Stress-Corrosion Susceptibility Factor (SCF)

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

3.3.2.3 Extrusions not conforming to 3.3.2.1 or 3.3.2.2 are not acceptable and may be given additional overaging heat treatment. If, upon completion of such treatment, extrusions conform to 3.3.2.1 and 3.3.2.2, they are acceptable.

3.3.3 Exfoliation-Corrosion Resistance

Specimens, cut from extrusions, shall not exhibit exfoliation corrosion, at a T/10 plane, greater than that illustrated by Photo B, 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 thickness, shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction at 35.0 ksi (241 MPa).

3.4 Quality

Extrusions, 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.

3.4.1 When specified, extrusions shall be subjected to ultrasonic inspection in accordance with ASTM B594 and shall meet the following requirements:

3.4.1.1 Each bar, rod, and profile, having a maximum width-to-thickness ratio of 10:1, shall meet the ultrasonic class requirements shown in Table 3.

***Table 3 - Ultrasonic inspection parameters***

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

3.5 Tolerances

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

3.6 Exceptions

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

3.7 Production, distribution, and procurement of metal stock shall comply with AS6279. This requirement becomes effective 18 months after publication of AMS4342G.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of extrusions 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 extrusions conform to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (see 3.1), tensile properties (see 3.3.1), corrosion resistance (see 3.3.2), ultrasonic inspection when specified (see 3.4.1), and tolerances (see 3.5) are acceptance tests and, except for composition, shall be performed on each lot.

4.2.2 Periodic Tests

Exfoliation-corrosion resistance (see 3.3.3) and stress-corrosion resistance (see 3.3.4) are periodic tests and shall be performed at a frequency selected by the producer unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.