AEROSPACE MATERIAL SPECIFICATION

AMS4326™	REV. B

Issued 2004-11
Reaffirmed 2017-11
Revised 2023-12

Superseding AMS4326A

Aluminum Alloy, 2013, Extruded Bar, Rod, and Profiles, 1.0Mg - 0.80Si - 1.8Cu - 0.20Cr (2013 -T6511), Solution Heat Treated, Stress-Relieved by Stretching, and Aged

(Composition similar to UNS A92013)

RATIONALE

AMS4326B results from a Five-Year Review and update of this specification with changes to with changes to add AS6279 controls (see 3.8), update wording to prohibit unauthorized exceptions (see 3.4.2, 3.7 and 8.4), relocate Definitions (see 2.4), update Applicable Documents (see Section 2) and remove obsolete weight criteria from Ultrasonic Inspection (see 3.5.1).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of extruded bars, rods, and integrated profiles up to 0.200 inch (5.08.mm), inclusive, in nominal thickness (see 8.5).

1.2 Application

These extrusions have been used typically for parts requiring high strength, good toughness and fatigue properties, and good maximum 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

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

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/AMS4326B

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 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	0.6	1.0
Iron	--	0.40
Copper	1.5	2.0
Manganese	--	0.25
Magnesium	0.8	1.2
Chromium	0.04	0.35
Zinc	--	0.25
Titanium	--	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

Extruded, solution heat treated, and stress-relieved by stretching to produce a nominal permanent set of 1.5%, but not less than 1% nor more than 3%, and artificially aged to the T6511 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

Extrusions shall conform to the following requirements, determined on the mill produced size, in accordance with AMS2355 and as specified herein:

3.3.1 Solution Heat Treatment

Shall be in accordance with AMS2772, and as follows: heat to 1013 °F ± 10 °F (545 °C ± 6 °C), hold at heat for a time commensurate with section thickness, and cool rapidly.

3.3.2 Artificial Aging Heat Treatment

Heat to 374 °F ± 10 °F (190 °C ± 6 °C), hold at heat for a time of 7 to 9 hours, and air cool.

3.4 Properties

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

3.4.1 Longitudinal Tensile Properties in the T6511 Condition

Shall be as shown in Table 2.

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

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 0.200, incl	58.0	53.0	8

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 5.08, incl	400	365	8

3.4.3 Exfoliation Corrosion Resistance in the T6511 Temper as Received

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

3.5 Quality

Products, as received by the purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from conditions detrimental to usage of the extrusions. Any detrimental conditions found during the customer's manufacturing process are subject to rejection.

3.5.1 When specified, each extrusion shall be subjected to ultrasonic inspection in accordance with ASTM B594. Extrusions, 0.500 inch (12.7 mm) and over in nominal diameter or least distance between parallel sides, shall meet ultrasonic Class B requirements, as described in ASTM B594.

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.

3.8 Production, Distribution, and Procurement

Production, distribution, and procurement of metal stock shall comply with AS6279. This requirement becomes effective 18 months after publication of AMS4326B.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the products 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), tolerances (see 3.6), and ultrasonic inspection when specified (see 3.5.1), 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 chemical composition, ultrasonic inspection when required, and tolerances, showing the numerical results of tests on each inspection lot to determine conformance to the other acceptance test requirements, and stating that the final product conforms to the other technical requirements. This report shall include the purchase order number, inspection lot number, condition, AMS4326B, section identification number, mill product form and size, quantity, and the identity of the producer.

4.4.1 When material produced to this specification is beyond the sizes allowed in the scope of 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 AMS4326B(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

4.5 Resampling and Retesting

Shall be in accordance with AMS2355.