AEROSPACE MATERIAL SPECIFICATION

AMS4066™	REV. D

Issued 1992-01
Reaffirmed 2000-08
Revised 2022-04

Superseding AMS4066C

Aluminum Alloy, Drawn, Round Seamless Tubing
6.3Cu - 0.30Mn - 0.18Zr - 0.10V - 0.06Ti - (2219-T8511)
Solution Heat Treated, Stress Relieved by Stretching and Precipitation Heat Treated

(Composition similar to UNS A92219)

RATIONALE

AMS4066D results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (3.3.2, 3.6, 4.4.1, 5.1.1, 8.5), update applicable documents (Section 2, 3.2, 8.3) and ordering information (8.6), and allow use of the immediate prior revision of this specification (8.4).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of drawn, round seamless tubing 0.500 inch (12.70 mm) and over in OD with nominal wall thickness of 0.029 to 0.500 inch (0.74 to 12.70 mm) (see 8.6).

1.2 Application

This tubing has been used typically for structures requiring good fusion weldability and a combination of good strength and 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
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/AMS4066D/

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

2.3 ANSI Accredited Publications

Copies of these documents are available online at http://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)

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	--	0.20
Iron	--	0.30
Copper	5.8	6.8
Manganese	0.20	0.40
Magnesium	--	0.02
Zinc	--	0.10
Titanium	0.02	0.10
Vanadium	0.05	0.15
Zirconium	0.10	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 permanent set of 1/2 to 3%, and precipitation heat treated to the T8511 temper (refer to ANSI H35.1/H35.1M). Solution and precipitation heat treatments shall be performed in accordance with AMS2772.

3.3 Properties

Tubing shall conform to the following requirements, determined in accordance with AMS2355:

3.3.1 Tensile Properties

Shall be as specified in Table 2.

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

Nominal Wall Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 inches % Strip	Elongation in 2 inches % Full Section
0.029 to 0.049, incl	60.0	42.0	--	6
Over 0.049 to 0.500, incl	60.0	42.0	6	8

Table 2B - Minimum tensile properties, SI units

Nominal Wall Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm % Strip	Elongation in 50.8 mm % Full Section
0.74 to 1.24, incl	414	290	--	6
Over 1.24 to 12.70, incl	414	290	6	8

3.3.2 Mechanical property requirements for tubing outside the thickness range of 1.1 shall be as agreed upon by purchaser and producer

3.4 Quality

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

3.5 Tolerances

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

3.6 Exceptions

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

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection

The vendor of tubing shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the tubing conforms to the specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are acceptance tests and except for composition, shall be performed on each inspection lot.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.

4.4 Reports

The vendor of tubing shall furnish with each shipment a report stating that the tubing conforms to the composition requirements, tolerances and showing the numerical results of tensile tests on each inspection lot and stating that the tubing is in conformance to other technical requirements. This report shall include the purchase order number, lot number, AMS4066D, size, quantity, identification of the producer, 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 exceptions authorized by purchaser 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 AMS4066D(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

4.5 Resampling and Retesting

Shall be in accordance with AMS2355.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with ASTM B666/B666M.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be identified with AMS4066(EXC).

5.2 Tubing shall be prepared for shipment in accordance with ASTM B660 and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the tubing to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Tubing not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

The change bar (|) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revisions. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.

8.2 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.3 Terms used in AMS are defined in AS7766.

8.4 Unless otherwise specified, the material producer shall work to the revision of this specification (AMS4066) in effect on the date of order placement. Unless otherwise specified, material manufactured and certified to the immediately previous revision of this specification (AMS4066) may be procured and used until inventory is depleted.