AEROSPACE MATERIAL SPECIFICATION

AMS4070™	REV. P

Issued 1940-10
Reaffirmed 2006-04
Revised 2023-08

Superseding AMS4070N

Aluminum Alloy, Drawn, Round Seamless Tubing
2.5Mg - 0.25Cr (5052-O)
Annealed

(Composition similar to UNS A95052)

RATIONALE

AMS4070P is the result of a Five-Year Review and update of this specification with changes to update wording to prohibit unauthorized exceptions (see 3.3.1.1, 3.6, 4.4.1, 5.1.1, and 8.3), relocate Definitions (see 2.4), update Applicable Documents (see Section 2), and allow the use of the immediate prior revision of this specification (see 8.4).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of drawn, round seamless tubing with wall thicknesses of 0.010 to 0.450 inch (0.25 to 11.43 mm), inclusive (see 8.5).

1.2 Application

This tubing has been used typically for parts, such as brackets, conduits, and low-pressure fluid lines, requiring good weldability, moderate strength, and good resistance to corrosion, 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

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/AMS4070P

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 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.

2.4.1 A double flare is similar to a standard single flare except that the flare is folded back on itself such that the cut edge is inside the flare near the ID of the tube. Definitions and illustration of single flaring is shown in AS4430; double flaring is defined and illustrated in AS33583.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight as shown in Table 1, determined in accordance with AMS2355.

Table 1 - Composition

Element	Min	Max
Silicon	--	0.25
Iron	--	0.40
Copper	--	0.10
Manganese	--	0.10
Magnesium	2.2	2.8
Chromium	0.15	0.35
Zinc	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

Annealed.

3.3 Properties

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

3.3.1 Tensile Properties

Shall be shown in Table 2 for tubing having nominal wall thickness of 0.010 to 0.450 inch (0.25 to 11.43 mm), inclusive.

Table 2 - Tensile properties

Property	Value
Tensile Strength	25.0 to 35.0 ksi (172 to 241 MPa)
Yield Strength at 0.2% Offset, min	10.0 ksi (68.9 MPa)

3.3.1.1 Mechanical property requirements for product outside of the range covered by 1.1 shall be agreed upon between the purchaser and producer and reported as in 4.4.1 (see 8.5).

3.3.2 Flattening

Tubing having nominal wall thickness less than 10% of the nominal OD shall withstand, without cracking, flattening sideways under a load applied gradually at room temperature until the outside dimension under load is equal to three times the nominal wall thickness.

3.3.2.1 If tubing does not pass the flattening test of 3.3.2, a section of tube not less than 1/2 inch (12.7 mm) in length and embracing one-third to one-half the circumference of the tube shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the nominal wall thickness of the tubing with axis of bend parallel to axis of tube and with inside of tube on inside of bend.

3.3.3 Flarability

Tubing with a nominal OD of 0.125 to 0.312 inch (3.18 to 7.92 mm) and wall thickness up to 0.035 inch (0.89 mm) and tubing with a nominal OD of 0.313 to 0.375 inch (7.95 to 9.52 mm) and nominal wall thickness not greater than 0.049 inch (1.24 mm) shall withstand double-flaring (see 2.4.1), and tubing with nominal OD over 0.375 inch (9.52 mm) shall withstand single-flaring (see 2.4.1) without formation of cracks or other visible defects by being forced, at room temperature, axially with steady pressure over a hardened and polished tapered steel pin having a 74-degree included angle to produce a flare having a permanent expanded OD not less than specified in Table 3.

Table 3A - Minimum flarability, inch/pound units

Nominal OD Inches	Expanded OD Inches	Nominal OD Inches	Expanded OD Inches
0.125	0.200	1.000	1.187
0.188	0.302	1.250	1.500
0.250	0.359	1.500	1.721
0.312	0.421	1.750	2.106
0.375	0.484	2.000	2.356
0.500	0.656	2.500	2.856
0.625	0.781	3.000	3.356
0.750	0.937		

Table 3B - Minimum flarability, SI units

Nominal OD Millimeters	Expanded OD Millimeters	Nominal OD Millimeters	Expanded OD Millimeters
3.18	5.08	25.40	30.15
4.78	7.67	31.75	38.10
6.35	9.12	38.10	43.71
7.92	10.69	44.45	53.49
9.52	12.29	50.80	59.84
12.70	16.66	63.50	72.54
15.88	19.84	76.20	85.24
19.05	23.80		

3.3.3.1 Tubing with nominal OD between any two standard sizes shown in Table 2 shall take the same percentage flare as shown for the larger of the two sizes.

3.4 Quality

Tubing, 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 tubing.

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.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of tubing 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 tubing conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

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

4.2.2 Periodic Tests

Flattening (see 3.3.2) and flarability (see 3.3.3) are periodic tests 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 and the following:

4.3.1 Specimens for flarability test (see 3.3.3) shall be full tubes or sections cut from a tube. The end of the specimen to be flared shall be cut square, with the cut end smooth and free from burrs, but, except for sizes 0.375 inch (9.52 mm) and under in nominal diameter, not rounded.