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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4067H

Issued JUN 1942
Revised JUN 2000
Reaffirmed APR 2006

Superseding AMS 4067G

Aluminum Alloy, Drawn Round Seamless Tubing
1.25Mn - 0.12Cu (3003-H14)
Strain Hardened

UNS A93003

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of seamless drawn tubing.

1.2 Application:

This tubing has been used typically for parts, such as brackets, conduits, and low-pressure lines, requiring good weldability and 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 form 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
MAM 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled Forged, or Flash Welded Rings, Metric (SI) Units

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M Identification Marking of Aluminum Products

2.3 ANSI Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

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 AMS 2355 or MAM 2355.

TABLE 1 - Composition

Element	min	max
Silicon	--	0.6
Iron	--	0.7
Copper	0.05	0.20
Manganese	1.0	1.5
Zinc	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Strain hardened to H14 temper.

3.3 Properties:

Tubing shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355 on the mill produced size:

3.3.1 Tensile Properties: Shall be as specified in Table 2 and 3.3.1.1.

TABLE 2A - Minimum Tensile Properties, Inch/Pound Units

Nominal Wall Thickness Inch	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D, % Cut Out Specimen	Elongation in 2 Inches or 4D, % Full Section Specimen
0.010 to 0.024, incl	20.0	17.0	--	3
Over 0.024 to 0.049, incl	20.0	17.0	3	5
Over 0.049 to 0.259, incl	20.0	17.0	4	8
Over 0.259 to 0.500, incl	20.0	17.0	--	--

TABLE 2B - Minimum Tensile Properties, SI Units

Nominal Wall Thickness mm	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D, % Cut Out Specimen	Elongation in 50.8 mm or 4D %, Full Section Specimen
0.25 to 0.61, incl	138	117	--	3
Over 0.61 to 1.24, incl	138	117	3	5
Over 1.24 to 6.58, incl	138	117	4	8
Over 6.58 to 12.70, incl	138	117	--	--

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 six 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 four times the nominal wall thickness of the tubing with axis of bend parallel to axis of tube and with ID of tube on inside of bend.

3.3.3 Flarability: Specimens as in 4.3.1 from tubing 0.375 inch (9.52 mm) and under in nominal OD shall withstand being double-flared (see 8.2) and from tubing over 0.375 inch (9.52 mm) in nominal OD shall withstand being single-flared without formation of cracks or other visible defects by being forced axially, at room temperature, 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 that specified in Table 3.

TABLE 3A - Flarability, Parameters, Inch/Pound Units

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

TABLE 3B - Flarability, Parameters, SI Units

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

3.3.3.1 Tubing with nominal OD between any two standard sizes shown in Table 3 shall take the same percentage flare as that for the next larger standard size.

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.

3.4.1 Detrimental surface imperfections include, but are not limited to, cracks, splits, seams, inclusions, or severe crosshatching (surface breaks) that cannot be removed by light manual or machine polishing using 180 grit or finer abrasive.

3.5 Tolerances:

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