

AEROSPACE MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 4087c

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ALUMINUM ALLOY TUBING, SEAMLESS, DRAWN 4.5Cu - 1.5Mg - 0.60Mn (2024-0)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. APPLICATION: Parts and assemblies such as brackets where high strength, non-weldable material is required. Parts are usually heat treated to the T4 temper before use.
3. COMPOSITION:

	min	max
Copper	3.8	4.9
Magnesium	1.2	1.8
Manganese	0.30	0.9
Iron	--	0.50
Silicon	--	0.50
Zinc	--	0.25
Chromium	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

4. CONDITION: Annealed.
5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties:

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Tensile Strength, psi 32,000 max

- 5.2 Flattening: Tubing having nominal wall thickness less than 10% of the nominal OD shall be capable of withstanding, without cracking, flattening sideways under a load applied gradually at room temperature until the outside dimension under load is equal to the flattening factor times the nominal wall thickness.

Nominal Wall Thickness

Inch

Flattening Factor

Up to 0.040, incl

3

Over 0.049

4

- 5.2.1 If tubing does not pass the flattening test of 5.2, a section of the tube not less than 1/2 in. in length and embracing 1/3 to 1/2 the circumference of the tube shall be capable of withstanding, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to the bend factor times 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.

Nominal Wall Thickness Inch	Bend Factor
Up to 0.049, incl	1
Over 0.049	2

- 5.3 Flarability: Tubing with nominal OD of 0.375 in. and under shall be capable of being double-flared and tubing with nominal OD over 0.375 in. shall be capable of being single-flared without formation of cracks or other visible defects. Specimens for flaring may be cut from any portion of the tube, or an entire tube may be used as a specimen. The end of the specimen to be flared shall be cut square, with the cut end smooth and free from burrs, but not rounded except for sizes 0.375 in. and under. The specimen shall, at room temperature, be forced axially with steady pressure over a hardened and polished tapered steel pin having a 74 deg included angle, to produce a flare having the permanent expanded OD specified in the following table:

Nominal OD Inches	Expanded OD Inches, min	Nominal OD Inches	Expanded OD Inches, min
0.125	0.224	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

- 5.3.1 Tubing with intermediate nominal OD shall take the same percentage flare as that for the next larger OD.
- 5.3.2 Tubing with nominal OD greater than 3.000 in. or less than 0.125 in. shall have flarability as agreed upon by purchaser and vendor.
- 5.4 Properties After Heat Treatment: Tubing after proper solution heat treatment and aging for not less than 4 days at room temperature shall conform to the following requirements:

5.4.1 Tensile Properties:

Nominal Wall Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,500,000)		Elongation % in 2 in.	
		psi, min	Extension under load in. in 2 in.	Strip	Full Section
0.018 to 0.024, incl	64,000	40,000	0.0116	--	10
Over 0.024 to 0.049, incl	64,000	40,000	0.0116	10	12
Over 0.049 to 0.259, incl	64,000	40,000	0.0116	10	14
Over 0.259 to 0.500, incl	64,000	40,000	0.0116	12	16

5.4.1.1 When a dispute occurs between purchaser and vendor over the yield strength value,
Ø yield strength determined by the offset method shall apply.

6. QUALITY: Tubing shall be uniform in quality and condition, clean, sound, smooth, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2203.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and technical requirements of this specification. This report shall include the purchase order number, material specification number, size, and quantity.

8.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

9. IDENTIFICATION:

9.1 Unless otherwise specified, each tube 0.500 in. and over in OD shall be marked with the alloy number and temper, or AMS 4087, and manufacturer's identification. The characters shall be of such size as to be clearly legible, shall be applied recurring at intervals not exceeding 3 ft using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling.