



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 4079A

Superseding AMS 4079

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ALUMINUM ALLOY TUBING, SEAMLESS, DRAWN, ROUND, CLOSE TOLERANCE 1.0Mg - 0.60Si - 0.30Cu - 0.20Cr (6061-0)

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Primarily for ducts requiring high strength and small radius bends.
3. **COMPOSITION:**

	min	max
Magnesium	0.8	- 1.2
Silicon	0.40	- 0.8
Copper	0.15	- 0.40
Chromium	0.04	- 0.35
Iron	--	0.7
Zinc	--	0.25
Manganese	--	0.15
Titanium	--	0.15
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

- Ø 4. **CONDITION:** Annealed, then drawn if required to meet dimensional tolerances.
5. **TECHNICAL REQUIREMENTS:** The product shall conform to the following requirements; tensile properties shall be determined in accordance with the latest issue of AMS 2355.
 - 5.1 **Properties As Annealed:**
 - 5.1.1 **Tensile Properties:** The following requirements apply to tubing having nominal wall thickness of 0.018 to 0.500 in. inclusive:

Tensile Strength psi, max	Yield Strength at 0.2% Offset or at Extension Indicated (E = 9,900,000)		Elongation % in 2 in. or 4D, min	
	psi, max	in. in 2 in.	Strip	Full Section
22,000	14,000	0.0068	15	15

- 5.1.1.1 Tensile properties shall be as agreed upon by purchaser and vendor for tubing having nominal wall thickness under 0.018 inch.
- 5.1.1.2 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength determined by the offset method shall apply.
- 5.1.2 **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.

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Nominal Wall Thickness Inch	Flattening Factor
Up to 0.120, incl	3
Over 0.120 to 0.238, incl	4
Over 0.238 to 0.500, incl	6

5.1.2.1 If tubing does not pass the flattening test of 5.1.2, a section of 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 0.120, incl	1
Over 0.120 to 0.238, incl	2
Over 0.238 to 0.500, incl	4

5.2 Properties After Heat Treatment: Tubing after proper solution and precipitation heat treatment shall conform to the following requirements:

5.2.1 Tensile Properties: The following requirements apply to tubing having nominal wall thickness of 0.025 to 0.500 in., inclusive:

Nominal Wall Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 9,900,000)		Elongation % in 2 in. or 4D, min	
		psi, min	Extension Under Load in. in 2 in.	Strip	Full Section
0.025 to 0.049, incl	42,000	35,000	0.0111	8	10
Over 0.049 to 0.259, incl	42,000	35,000	0.0111	10	12
Over 0.259 to 0.500, incl	42,000	35,000	0.0111	12	14

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

5.2.2 Hardness: Tubing should have hardness not lower than Rockwell B 50 or equivalent, but shall not be rejected on the basis of hardness if the tensile property requirements are met.

6. QUALITY:

6.1 Tubing shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts. A polished and etched cross-section of a tube shall show no evidence of cracks, seams, or folds when examined at a magnification of 100 diameters.

6.1.1 Detrimental imperfections include, but are not limited to, any cracks, splits, seams, inclusions, or severe crosshatching (surface breaks) that cannot be removed by lightly hand sanding, using 180 grit or finer sand paper.

7. TOLERANCES: Except as specified below for diameter and wall thickness, tolerances shall conform to all applicable requirements of the latest issue of AMS 2203.