AERONAUTICAL MATERIAL SPECIFICATIONS

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

AMS 4071E

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ALUMINUM ALLOY TUBING, HYDRAULIC, SEAMLESS, DRAWN
2.5Mg - 0.25Cr (5052-0)

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 aircraft hydraulic systems up to 1500 psi operating pressure.

3. COMPOSITION:

Magnesium	2.2 - 2.8
Chromium	0.15 - 0.35
Iron + Silicon	0.45 max
Zinc	0.20 max
Manganese	0.10 max
Copper	0.10 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

4. CONDITION: Annealed, then drawn if required to meet dimensional tolerances.

4.1 Unless otherwise specified, tubing shall be supplied unground.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties: Unless otherwise specified, tubing shall conform to the following requirements:

Tensile Strength psi	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,100,000)	
	psi	Extension Under Load in. in 2 in.
26,000 min	10,000 min	0.0060
35,000 max	20,000 max	0.0080

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

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 3 times the nominal wall thickness.

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5.2.1 If tubing does not pass the flattening test of 5.2, a section of the tube not less than $\frac{1}{2}$ 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 nominal wall thickness of the tubing with axis of bend parallel to axis of tube and with inside of tube on inside of bend.

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		

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 2.00 in. or less than 0.125 in. shall have flarability as agreed upon by purchaser and vendor.

5.4 Hydraulic Strength: Each length of tubing shall be capable of withstanding an internal hydrostatic pressure (P), calculated according to the following formula, without developing leaks and without an increase in mean diameter of more than 0.2%:

$$P = \frac{1.9tS}{D-t}$$

Where:

P = Test pressure in psi.
t = Minimum wall thickness (nominal wall thickness minus maximum negative tolerance) in inches.
S = Minimum yield strength from 5.1.
D = Nominal OD of tube in inches.

5.4.1 Mean diameter is the average of two diameters at right angles to each other in the same transverse plane; measurements before and after testing should be taken at substantially the same location.

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