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

AMS 4070E

Issued 10-15-40
Revised 1-15-57

ALUMINUM ALLOY TUBING, 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. 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

3. CONDITION: Annealed.

4. TECHNICAL REQUIREMENTS:

4.1 Tensile Properties:

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

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

4.2 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.

4.2.1 If tubing does not pass the flattening test of 4.2, 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.

4.3 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		

4.3.1 Tubing with intermediate nominal OD shall take the same percentage flare as that for the next larger OD.

4.3.2 Tubing with nominal OD greater than 2.00 in. or less than 0.125 in. shall have ø flarability as agreed upon by purchaser and vendor.

5. QUALITY: 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.

6. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2203 as applicable to non-heat treatable alloys. Diameter shall conform to Table I, column headed "Mean Diameter".

7. REPORTS:

7.1 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 ø shall include the purchase order number, material specification number, size, and quantity.

7.2 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.

8. IDENTIFICATION:

8.1 Unless otherwise specified, each tube 0.25 in. and over in OD shall be marked with the manufacturer's identification, and, in addition, the alloy name or number and temper, or AMS 4070. The characters shall be of such size as to be clearly legible, shall be applied recurring at intervals not exceeding 2 ft using a suitable marking fluid, and shall not be obliterated by normal handling or heat treatment.

8.2 Tubing less than 0.25 in. in OD shall be identified as agreed upon by purchaser and vendor.