



# AEROSPACE MATERIAL SPECIFICATION

**Society of Automotive Engineers, Inc.**  
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**AMS 4070G**  
Superseding AMS 4070F

Issued 10-15-40  
Revised 11-1-69

## ALUMINUM ALLOY TUBING, SEAMLESS, DRAWN, ROUND 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 parts and assemblies such as brackets, conduits, and low-pressure liquid lines, where good weldability, moderate strength, and good resistance to corrosion are required.
3. **COMPOSITION:**

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

4. **CONDITION:** Annealed.
5. **TECHNICAL REQUIREMENTS:** The product shall conform to the following requirements; tensile  $\emptyset$  properties shall be determined in accordance with the latest issue of AMS 2355.
  - 5.1 **Tensile Properties:** The following requirements apply to tubing having a nominal wall thickness of  $\emptyset$  0.010 to 0.450 in., inclusive:
 

|                                    |                 |
|------------------------------------|-----------------|
| Tensile Strength, psi              | 25,000 - 35,000 |
| Yield Strength at 0.2% Offset, psi | 10,000 min      |

    - 5.1.1 Tensile for tubing having nominal wall thickness under 0.010 in. or over 0.450 inch property requirements shall be as agreed upon by purchaser and vendor.
    - 5.1.2 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength  $\emptyset$  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.
    - 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 nominal wall thickness of the tubing with axis of bend parallel to axis of tube and with inside of tube on inside of bend.

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- 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<br>Inches | Expanded OD<br>Inches, min | Nominal OD<br>Inches | Expanded OD<br>Inches, min |
|----------------------|----------------------------|----------------------|----------------------------|
| 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                      |

- 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.

6. **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.

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 and its revision letter, 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 and its revision letter, 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:** Unless otherwise specified, tubing shall be identified as follows:

- 9.1 **Straight Tubes 0.029 In. and Over in Wall Thickness and 0.500 In. and Over in OD, Minor Axis, or Least Width of Flat Surface:** Shall be marked in a row of characters recurring at intervals not greater than 3 ft with the alloy number and temper, AMS 4070 or applicable Federal or Military specification designation, and manufacturer's identification. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling.