

# AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 4171

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

Issued 11-1-59  
Revised

ALUMINUM ALLOY EXTRUSIONS  
4.3Zn - 3.3Mg - 0.6Cu - 0.2Mn - 0.17Cr (7079-T6)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for extrusions having large cross sectional areas.
3. FORM: Bars, rods, and shapes.
4. COMPOSITION:

Zinc	3.8 - 4.8
Magnesium	2.9 - 3.7
Copper	0.40 - 0.8
Manganese	0.10 - 0.30
Chromium	0.10 - 0.25
Iron	0.40 max
Silicon	0.30 max
Titanium	0.10 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

5. CONDITION: Solution and precipitation heat treated.
- 5.1 Unless otherwise specified, extrusions shall be supplied with an as-extruded surface finish; light polishing to remove minor surface imperfections is permissible provided such imperfections can be removed within the dimensional tolerances.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no obligation to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the reports are responsible for protecting themselves against liability for infringement of patents."

6. TECHNICAL REQUIREMENTS:

6.1 Tensile Properties: Test specimens shall conform to ASTM E8-57 and shall be cut parallel to the direction of extrusion. The tensile property requirements shall be based on the thickness of the portion of the extrusion from which the test specimens are taken. Specimens from sections over 1.5 in. in diameter or thickness shall be taken midway between center and surface.

Nominal Diameter Or Least Thickness Inches	Cross Sectional Area Square Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,300,000)		Elonga- tion % in 4D min
			psi, min	Extension Under Load in. in 2 in.	
Under 0.250	20 and under	75,000	67,000	0.0170	7
0.250 to 0.499, incl	20 and under	77,000	68,000	0.0172	7
Over 0.499 to 1.499, incl	20 and under	78,000	70,000	0.0176	7
Over 1.499 to 4.499, incl	20 and under	79,000	70,000	0.0176	7
Over 2.999 to 4.999, incl	Over 20 to 32, incl	77,000	70,000	0.0176	7
Over 2.999 to 4.999, incl	Over 32 to 50, incl	76,000	68,000	0.0172	7
Over 4.499 to 5.999, incl	38 and under	78,000	68,000	0.0172	6
Over 4.999 to 5.999, incl	Over 38 to 60, incl	76,000	68,000	0.0172	6
Over 5.999 to 6.999, incl	50 and under	76,000	66,000	0.0168	6
Over 5.999 to 6.999, incl	Over 50 to 60, incl	74,000	64,000	0.0164	4

- 6.1.1 If sizes other than those shown above are ordered, tensile properties shall be as agreed upon by purchaser and vendor.
- 6.1.2 When a dispute occurs between purchaser and vendor over the yield strength value, yield strength determined by the offset method shall apply.
- 6.1.3 For material of such thickness that a standard specimen cannot be taken, or for material thinner than 0.062 in., the test for elongation is not required.
- 6.2 Transverse Properties: Shall be as agreed upon by purchaser and vendor.
- 6.3 Hardness: Material should have hardness not lower than Brinell 130 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 134 using 1000 kg load and 10 mm ball, but shall not be rejected on the basis of hardness if the tensile property requirements are met.
7. QUALITY: Material 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.
8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2205 as applicable.
9. REPORTS:
- 9.1 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 or section identification number, and quantity.