AEROSPACE
MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York, N.Y. 10017

AMS 4168B
Superseding AMS 4168A

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ALUMINUM ALLOY EXTRUSIONS
5.6Zn - 2.5Mg - 1.6Cu - 0.30Cr (7075-T6510)
Stress-Relief Stretched, Unstraightened

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. FORM: Bars, rods, shapes, and round tubing.

3. APPLICATION: Primarily for parts subject to excessive warpage during machining due to residual stresses, and for parts requiring high strength and whose fabrication does not involve welding or forming. Certain design and processing procedures may cause this material to be susceptible to stress corrosion cracking; ARP 823 recommends practices to minimize such conditions.

4. COMPOSITION:

	min	max
Zinc	5.1	6.1
Magnesium	2.1	2.9
Copper	1.2	2.0
Chromium	0.18	0.40
Iron	--	0.7
Silicon	--	0.50
Manganese	--	0.30
Titanium	--	0.20
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

5. CONDITION: Solution heat treated, stress-relieved by stretching, 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.

5.2 Material shall be stretched in the solution heat treated condition to produce a nominal permanent set of 1.5%, but not less than 1% nor more than 3%.

5.3 Material shall receive no straightening after stretching.

6. TECHNICAL REQUIREMENTS: The product shall conform to the following requirements; tensile properties shall be determined in accordance with the latest issue of AMS 2355.

6.1 Longitudinal Tensile Properties:

Nominal Diameter or Thickness, and Area (bars, rods, shapes) or Nominal Wall Thickness and Area (tubing) Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,300,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in. or 4D min
Up to 0.250, excl, all areas	78,000	70,000	0.0176	7
0.250 to 0.499, incl, all areas	81,000	73,000	0.0182	7
Over 0.499 to 2.999, incl, all areas	81,000	72,000	0.0180	7
Over 2.999 to 4.499, incl				
Area up to 20 sq in., incl	81,000	71,000	0.0178	7
Area over 20 to 32 sq in., incl	78,000	70,000	0.0176	6
Over 4.499 to 5.000, incl				
Area up to 32 sq in., incl	78,000	68,000	0.0172	6

6.2 Long Transverse Tensile Properties: Rods, bars, and shapes, when tested in the long transverse direction, shall be capable of meeting the following properties:

Ø Nominal Diameter or Thickness and Area Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,300,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in. or 4D min
Up to 0.250, excl				
Area up to 20 sq in., incl	76,000	64,000	0.0164	5
0.250 to 0.499, incl				
Area up to 20 sq in., incl	77,000	66,000	0.0168	5
Over 0.499 to 0.749, incl				
Area up to 20 sq in., incl	73,000	63,000	0.0162	4
Over 0.749 to 1.499, incl				
Area up to 20 sq in., incl	72,000	62,000	0.0160	3
Over 1.499 to 2.999, incl				
Area up to 20 sq in., incl	66,000	57,000	0.0151	1
Over 2.999 to 4.499, incl				
Area up to 20 sq in., incl	66,000	56,000	0.0149	1
Area over 20 to 32 sq in., incl	65,000	55,000	0.0147	1
Over 4.499 to 5.000, incl				
Area up to 32 sq in., incl	64,000	54,000	0.0145	1

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

6.4 If sizes other than those shown are ordered, tensile property requirements shall be as agreed upon by purchaser and vendor.

6.5 Hardness: Material should have hardness not lower than Brinell 135 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 140 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.