AEROSPACE
MATERIAL SPECIFICATIONS

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

AMS 4167 A
Superseding AMS 4167

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ALUMINUM ALLOY EXTRUSIONS
5.6Zn - 2.5Mg - 1.6Cu - 0.30Cr (7075-T73511)
Stress-Relief Stretched and Straightened

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, and shapes.

3. APPLICATION: Primarily for machined parts subject to excessive warpage during machining due to residual stresses, and for parts requiring high strength and resistance to stress corrosion cracking.

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 to develop the required mechanical properties and resistance to stress corrosion cracking.

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 treated condition to produce a nominal permanent set of 1-1/2%, but not less than 1% nor more than 3%.

5.3 Material may receive minor straightening after stretching of an amount necessary to meet the requirements of Section 8.

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 Tensile Properties:

Nominal Diameter or Least Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,300,000)		Elongation % in 2 in. or 4D min
		psi, min	Extension Under Load in. in 2 in.	
Up to 0.249, incl	66,000	58,000	0.0153	7
Over 0.249 to 0.499, incl	69,000	61,000	0.0158	7
Over 0.499 to 1.499, incl	70,000	61,000	0.0158	7

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

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

6.2 Hardness: Material should have hardness not lower than Brinell 125 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 130 using 1000 kg load and 10 mm ball, but shall not be rejected on the basis of hardness if other technical requirements are met.

6.3 Conductivity:

6.3.1 If the conductivity is below 38% IACS (International Annealed Copper Standard), the material is considered unsatisfactory and must be reprocessed, regardless of property level.

6.3.2 If the conductivity is 40% IACS or higher and the tensile properties meet specified requirements, the material is considered to be satisfactory.

6.3.3 If the conductivity is 38 - 40% IACS, the tensile properties meet specified requirements, and the yield strength does not exceed the specified minimum by more than 11,900 psi, the material is considered to be satisfactory.

6.3.4 If the conductivity is below 40% IACS and the yield strength exceeds the specified minimum value by 12,000 psi or more, the material is considered suspect.

6.3.5 When material is considered suspect, it may be reprocessed or a sample of the material may be heated for not less than 30 min. at 870 F ± 10 (465.6 C ± 5.6) and quenched in cold water. Conductivity shall then be measured within 15 min. after quenching. If the difference between this measurement and the original measurement on the material is 6% or more, the material is satisfactory. If the difference is less than 6%, the material must be reprocessed.

6.4 Stress Corrosion Cracking Test: Material shall be capable of showing no evidence of stress corrosion cracking when subjected to the following test:

6.4.1 A suitable test specimen, cut from the material so that the axis of loading of the specimen is parallel to the short transverse direction of the material, shall be stressed to 75% of the yield strength value given in 6.1 and held at constant strain in a suitable fixture. The stressed specimen shall be subjected to cyclic immersion for 30 days in a 3-1/2% solution of sodium chloride conforming to the purity and pH requirements of the issue of ASTM B117 listed in the latest issue of AMS 2350, and maintaned at room temperature; each cycle shall consist of 10 min. immersion in the solution and 50 min. out of the solution. Specimens shall be dried prior to each immersion.