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

AEROSPACE MATERIAL SPECIFICATIONS

AMS 4153 E
Superseding AMS 4153D
Issued 11-1-46
Revised 11-1-67

ALUMINUM ALLOY EXTRUSIONS
4.5Cu - 0.85Si - 0.80Mn - 0.50Mg (2014-T6)

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, wire, shapes, and tubing.

3. APPLICATION: Primarily for parts requiring good strength and whose fabrication does not usually involve welding. 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
Copper	3.9	5.0
Silicon	0.50	1.2
Manganese	0.40	1.2
Magnesium	0.20	0.8
Iron	--	1.0
Zinc	--	0.25
Titanium	--	0.15
Chromium	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
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.

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 (rods, bars, shapes) or Nominal Wall Thickness and Area (tubing) inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,500,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in. or 4D min
Up to 0.499, incl, all areas	60,000	53,000	0.0141	7
Over 0.499 to 0.749, incl, all areas	64,000	58,000	0.0150	7
Over 0.749				
Area up to 25 sq in., incl	68,000	60,000	0.0154	7
Area over 25 to 32 sq in., incl	68,000	58,000	0.0150	6

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 above are ordered, tensile properties shall be as agreed upon by purchaser and vendor.

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

Nominal Diameter or Thickness, and Area Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,500,000)		Elongation % in 2 in. or 4D min
		psi, min	Extension Under Load in. in 2 in.	
0.125 to 0.375, incl				
Area 25 sq in. and under	60,000	53,000	0.0141	--
Over 0.375 to 0.499, incl				
Area 25 sq in. and under	60,000	53,000	0.0141	5
Over 0.499 to 0.749, incl				
Area 25 sq in. and under	64,000	55,000	0.0145	5
Over 0.749 to 1.499, incl				
Area 25 sq in. and under	63,000	54,000	0.0143	2
Over 0.749 to 4.499, incl				
Area over 25 to 32 sq in. incl	56,000	47,000	0.0129	1
Over 1.499 to 2.999, incl				
Area 25 sq in. and under	61,000	52,000	0.0139	2
Over 2.999 to 4.499, incl				
Area 25 sq in. and under	58,000	49,000	0.0133	1

6.3 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 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 all applicable requirements of the latest issue of AMS 2205.

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 tensile requirements of this specification. This report shall include the purchase order number, material specification number, size or section identification number, and quantity.

9.2 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.