The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4118J

Issued DEC 1939
Revised JAN 1994

Submitted for recognition as an American National Standard

Superseding AMS 4118H

ALUMINUM ALLOY, ROLLED OR COLD FINISHED BARS, RODS, AND WIRE 4.0Cu - 0.70Mn - 0.60Mg - 0.50Si (2017; -T4, -T451) Solution Heat Treated

UNS A92017

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of bars, rods, and wire.

1.2 Application:

These products have been used typically for parts requiring good strength and whose fabrication does not involve welding, but usage is not limited to such applications.

1.2.1 Certain design and processing procedures may cause these products to become susceptible to stress-corrosion cracking; ARP823 recommends practices to minimize such conditions.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2201 Tolerances, Aluminum and Aluminum Alloy Bar, Rod, Wire, and Forging Stock, Rolled or Cold Finished
MAM 2201 Tolerances, Metric, Aluminum and Aluminum Alloy Bar, Rod, Wire, and Forging Stock, Rolled, Drawn, or Cold Finished
AMS 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
MAM 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units
AMS 2811 Identification, Aluminum and Magnesium Alloy Wrought Products

ARP823 Minimizing Stress-Corrosion Cracking in Wrought Heat Treatable Aluminum Alloy Products

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS 2355 or MAM 2355.

TABLE 1 - Composition

Element	Min	Max
Copper	3.5	4.5
Manganese	0.40	1.0
Magnesium	0.40	0.8
Silicon	0.20	0.8
Iron		0.7
Zinc	--	0.25
Titanium	--	0.15
Chromium	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Rolled or cold finished, as ordered, and solution heat treated in accordance with MIL-H-6088.

3.2.1 (R) Product under 0.500 inch (12.70 mm) or over 7 inches (178 mm) in nominal diameter or distance between parallel sides shall be solution heat treated to -T4 temper. When -T4 temper is ordered, -T451 may be supplied.

3.2.2 Product 0.500 to 7 inches (12.70 to 178 mm), inclusive, in nominal diameter or distance between parallel sides shall, after solution heat treatment, be stress-relieved by stretching to produce a nominal permanent set of 1 to 3% (-T451 temper).

3.2.2.1 Product stress-relieved by stretching shall receive no further straightening operations after stretching unless specifically authorized by purchaser.

3.3 Properties:

The product shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 Tensile Properties: Shall be as shown in Table 2 for rounds 8.000 inches (203.20 mm) and under in nominal diameter and for squares, hexagons, octagons, and rectangles 50 square inches (322 cm^2) and under in cross-sectional area and 8.000 inches (203.20 mm) and under in least distance between parallel sides.

TABLE 2 - Minimum Tensile Properties

Property	Value
Tensile Strength	55.0 **ksi (379 MPa)**
Yield Strength at 0.2% Offset	32.0 ksi (221 MPa)
Elongation in 4D	12%

3.3.1.1 Yield strength and elongation requirements do not apply to wire under 0.125 inch (3.18 mm) in nominal diameter or least distance between parallel sides.

3.3.1.2 Tensile property requirements for product over 8.000 inches (203.20 mm) in nominal diameter or least distance between parallel sides and for squares, hexagons, octagons, and rectangles having a cross-sectional area over 50 square inches (322 CM^2) shall be as agreed upon by purchaser and vendor.

3.3.2 Hardness: Should be not lower than 90 HB/10/500 or 95 HB/10/1000 but the product shall not be rejected on the basis of hardness if the tensile property requirements are met.

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2201 or MAM 2201.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests for hardness (3.3.2) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.