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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-4118 REV H

Issued 1939-12-05
Revised 1990-04-01
Superseding AMS-4118G

Submitted for recognition as an American National Standard

ALUMINUM ALLOY BARS, RODS, AND WIRE, ROLLED OR COLD FINISHED
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: Primarily for parts requiring good strength and whose fabrication does not involve welding. 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.

2.1.1 Aerospace Material Specifications:

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 of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings
MAM-2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units
AMS-2811 - Identification, Aluminum and Magnesium Alloy Wrought Products

2.1.2 Aerospace Recommended Practices:

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 Naval Publications and Forms Center, Attn: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

2.3.1 Military Specifications:

MIL-H-6088 - Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS-2355 or MAM-2355:

	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 Ø 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.

3.2.2 Ø Product 0.500 to 7 inches (12.70 - 178 mm), incl, in nominal diameter or distance between parallel sides shall, after solution heat treatment, be stress-relieved by stretching to produce a nominal permanent set 1 - 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 follows 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:

Tensile Strength, minimum	55,000 psi (379 MPa)
Yield Strength at 0.2% Offset, minimum	32,000 psi (221 MPa)
Elongation in 4D, minimum	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.

4.3 Sampling: Shall be in accordance with AMS-2355 or MAM-2355.

4.4 Reports: The vendor of the product shall furnish with each shipment a report stating that the product conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS-4118H, size, and quantity.

4.5 Resampling and Retesting: Shall be in accordance with AMS-2355 or MAM-2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Shall be in accordance with AMS-2811.
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5.2 Packaging:

5.2.1 The product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

5.2.2 Ø For direct U.S. Military procurement, packaging shall be in accordance with ASTM B 660, Commercial Level, unless Level A is specified in the request for procurement.

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

7. REJECTIONS: Product not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES:

8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.

8.2 Dimensions and properties in inch/pound units are primary; dimensions and properties in SI units are shown as the approximate equivalents of the primary units and are presented only for information.

8.3 For direct U.S. Military procurement, purchase documents should specify not less than the following:

Title, number, and date of this specification
Form and size of product desired
Quantity of product desired
Level A packaging, if required (See 5.2.2).