AEROSPACE MATERIAL SPECIFICATION

AMS4118	REV. L

Issued 1939-12
Revised 2009-03
Reaffirmed 2014-05

Superseding AMS4118K

Aluminum Alloy, Rolled or Cold Finished Bars, Rods, and Wire
4.0Cu - 0.70Mn - 0.60Mg - 0.50Si (2017; -T4, -T451)
Solution Heat Treated
(Composition similar to UNS A92017)

RATIONALE

This document has been reaffirmed to comply with the SAE five-year review policy.

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 issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS2355	Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
AMS2772	Heat Treatment of Aluminum Alloy Raw Materials
ARP823	Minimizing Stress-Corrosion in Wrought Heat-Treatable Aluminum Alloy Products
AS1990	Aluminum Alloy Tempers

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS4118L

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M Identification Marking of Aluminum and Magnesium Products
ASTM E 29 Using Significant Digits in Test Data to Determine Conformance with Specifications

2.3 ANSI Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, http://assist.daps.dla.mil/quicksearch/.

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products
ANSI H35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS2355.

TABLE 1 - COMPOSITION

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

3.1.1 Test results may be rounded by the “rounding off” method of ASTM E 29.

3.1.2 Limits for alloying elements and other elements are expressed per ANSI H35.1.

3.2 Condition

Rolled or cold finished, as ordered, and solution heat treated in accordance with AMS2772.

3.2.1 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 (See AS1990).

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 AMS2355:

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.

3.4 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 ANSI H35.2 or ANSI H35.2M.

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 the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests

All tests are acceptance tests and except for composition, shall be performed on each inspection lot.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.

4.4 Reports

The vendor of the product shall furnish with each shipment a report stating that the product conforms to the composition and tolerances, and showing the numerical results of tests on each lot to determine conformance to the tensile property requirements. This report shall include the purchase order number, inspection lot number, AMS4118L, size, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.5 Resampling and Retesting

Shall be in accordance with AMS2355.