

AEROSPACE MATERIAL SPECIFICATION

Issued DEC 1939
Revised OCT 2001
Reaffirmed APR 2006

Superseding AMS 4118J

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)

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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

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

- 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 2772 Heat Treatment of Aluminum Alloy Raw Materials

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2006 SAE International

All rights reserved.

Printed in U.S.A.

QUESTIONS REGARDING THIS DOCUMENT:

TO PLACE A DOCUMENT ORDER:

SAE WEB ADDRESS:

(724) 772-7161
(724) 776-4970
<http://www.sae.org>

FAX: (724) 776-0243
FAX: (724) 776-0790

2.1 (Continued):

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

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 660 Packaging/Packing 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 ANSI, 25 West 43rd Street, New York, NY 10036-8002.

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 AMS 2355 or MAM 2355.

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 AMS 2772.

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.

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 cm²) 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 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 the 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 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 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, AMS 4118K, 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 AMS 2355 or MAM 2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Shall be in accordance with ASTM B 666/ASTM B 666M.

5.2 Packaging:

The product shall be prepared for shipment in accordance with ASTM B 660 in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT:

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