



AEROSPACE MATERIAL SPECIFICATION	AMS4118™	REV. M
	Issued 1939-12 Reaffirmed 2014-05 Revised 2022-07	
Superseding AMS4118L		
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

AMS4118M is the result of a Five-Year Review and update of this specification, with changes to prohibit unauthorized exceptions (3.3.1.2, 3.6, 4.4.1, 5.1.1, 8.6, 8.7), update form (1.1) and applicable documents (Section 2, 3.2.1, 3.2.2), and allow the use of the immediate prior specification revision (8.5).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of bars, rods, and wire 8.000 inches (203.20 mm) and under in nominal diameter and for squares, hexagons, octagons, and rectangles 50 in² (322 cm²) and under in cross-sectional area and 8.000 inches (203.20 mm) and under in least distance between parallel sides (see 8.7).

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.

SAE Executive Standards Committee 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 revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2022 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

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
http://www.sae.org

SAE WEB ADDRESS:

For more information on this standard, visit
<https://www.sae.org/standards/content/AMS4118M/>

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2355	Quality Assurance, Sampling and Testing, Aluminum Alloys and Magnesium Alloy, Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings
AMS2772	Heat Treatment of Aluminum Alloy Raw Materials
ARP823	Minimizing Stress-Corrosion Cracking in Wrought Heat-Strength Aluminum Alloy Products
AS7766	Terms Used in Aerospace Metals Specifications

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 B660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B666/B666M	Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>. **Error! Hyperlink reference not valid.**

ANSI H35.1/H35.1M	Standard Alloy and Temper Designation System for Aluminum
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	

3.2 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 (refer to ANSI H35.1/H35.1M).

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) (refer to ANSI H35.1/H35.1M).

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 in² (322 cm²) and under in cross-sectional area and 8.000 inches (203.20 mm) and under in least distance between parallel sides.

Table 2A - Tensile properties, inch/pound units

Tensile Strength ksi, Min	Yield Strength at 0.2% Offset ksi, Min	Elongation in 2 Inches or 4D %, Min
55.0	32.0	12

Table 2B - Tensile properties, SI units

Tensile Strength MPa, Min	Yield Strength at 0.2% Offset MPa, Min	Elongation in 50.8 mm
379	221	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 Mechanical property requirements for product outside the size range covered by 1.1 shall be agreed upon between purchaser and producer and reported per 4.4.1 (see 8.7).

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.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for producer'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 producer 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, AMS4118M, size, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.4.1 When material produced to this specification is beyond the sizes allowed in the scope or tables, or other exceptions are taken to the technical requirements listed in Section 3, the report shall contain a statement "This material is certified as AMS4118M(EXC) because of the following exceptions:" and the specific exceptions shall be listed (also see 5.1.1).

4.5 Resampling and Retesting

Shall be in accordance with AMS2355.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with ASTM B666/ASTM B666M.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be identified with AMS4118(EXC).

5.2 Packaging

The product shall be prepared for shipment in accordance with ASTM B660 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 producer shall include 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.