SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4339A

Issued MAR 1994
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Superseding AMS 4339

Aluminum Alloy, Rolled or Cold Finished Bars and Rods
4.4Cu - 1.5Mg - 0.60Mn (2024-T851)
Solution Heat Treated, Cold Worked, and Artificially Aged

(Composition similar to UNS A92024)

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of rolled or cold finished bars and rods.

1.2 Application:

These products have been used typically for parts requiring higher yield strength than is afforded by naturally aged tempers of this alloy and whose fabrication does not involve welding, but usage is not limited to such applications.

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 or www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
AMS 2772	Heat Treatment of Aluminum Alloy Raw Materials

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

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM E 594	Ultrasonic Inspection of Aluminum-Alloy Products for Aerospace Applications
ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M	Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Publications:

Available from ANSI, 25 West 43rd Street, New York, NY 10036 or www.ansi.org.

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.

TABLE 1 - Composition

Element	min	max
Silicon	--	0.50
Iron	--	0.50
Copper	3.8	4.9
Manganese	0.30	0.9
Magnesium	1.2	1.8
Chromium	--	0.10
Zinc	--	0.25
Titanium	--	0.15
Other Impurities, Each	--	0.05
Other Impurities, Total	--	0.15
Aluminum	remainder	

3.2 Condition:

The product shall be solution heat treated, cold worked, and artificially aged and shall be stress-relieved by stretching or other means after heat treatment to produce a nominal permanent set of 1.5% but not less than 1% nor more than 3%. The heat treatment and aging shall be performed in accordance with AMS 2772.

3.2.1 Bars and rods 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 on the mill product:

3.3.1 Tensile Properties: Shall be as shown in Table 2 except as specified in 3.3.1.1.

TABLE 2 - Minimum Tensile Properties

Tensile Strength	66.0 ksi (455 MPa)
Yield Strength at 0.2% Offset	58.0 ksi (400 MPa)
Elongation in 2 Inches (50.8 mm) or 4D	5%

3.3.1.1 The requirements of 3.3.1 do not apply to rod under 0.500 inches (12.70 mm) or over 6.500 inches (165.10 mm) in nominal diameter nor to square, hexagonal, or octagonal bar having a maximum thickness over 3.500 inches (88.90 mm) or rectangular bar having a maximum thickness over 3.000 inches (76.20 mm) with corresponding maximum width over 6.000 inches (152.40 mm). For rectangular bar under 3.000 inches (76.20 mm) in thickness, maximum width is 10.000 inches (254.00 mm).

3.3.2 Electrical Conductivity: Shall be 35.0 to 42.5% IACS (International Annealed Copper Standard) (20.3 to 24.6 MS/m).

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.

3.4.1 When specified, the product shall be subjected to ultrasonic inspection in accordance with ASTM B 594. Standards for acceptance shall be agreed upon by purchaser and supplier.

3.5 Tolerances:

Shall conform to all applicable requirements of ANSI H35.2/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 technical requirements are acceptance tests and shall be performed on each lot.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2355.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report stating the product conforms to the composition, showing the numerical results of tests of each inspection lot to determine conformance to the acceptance test requirements and stating that the product conforms to any other technical requirements. This report shall include the purchase order number, inspection lot number, AMS 4339A, size and quantity. The report shall include the identity of the producer, the mill product form and the size of the mill product.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

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

5.2 Packaging:

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.

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.