SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS4122 REV. L

Issued 1945-10
Revised 2012-05

Superseding AMS4122K

Aluminum Alloy Bars, Rods, and Wire Rolled or Cold Finished, and Rings
5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T6, 7075-T651)
Solution and Precipitation Heat Treated
(Composition similar to UNS A97075)

RATIONALE

AMS4122L adds coverage for T651 temper (Title, 3.2.1) to facilitate future cancellation of AMS-QQ-A-225/9.

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of rolled or cold finished bars, rods, and wire, and of flash welded rings.

1.2 Application

These products have been used typically for parts requiring high strength where limited formability is acceptable.

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, 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

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/AMS4122L

AMS4186 Aluminum Alloy Bars, Rods, and Wire, Rolled or Cold Finished, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-F), As Fabricated

AMS7488 Rings, Flash Welded, Aluminum and Aluminum Alloys

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

AS1990 Aluminum Alloy Tempers

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

2.3 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036, Tel: 212-642-4900, www.ansi.org.

ANSI H35.2/H35.2M Dimensional Tolerances for Aluminum Mill Products

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	--	0.40
Iron	--	0.50
Copper	1.2	2.0
Manganese	--	0.30
Magnesium	2.1	2.9
Chromium	0.18	0.28
Zinc	5.1	6.1
Titanium	--	0.20
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.3 Condition

The product shall be supplied in the following condition:

3.3.1 Bar and Rod

Rolled or cold finished, solution heat treated, stress-relieved by stretching to produce a nominal permanent set of 1-1/2%, but not less than 1% nor more than 3%, and overaged to the T651 temper (See AS1990). Heat treatments shall be performed in accordance with AMS2772.

3.3.1.1 When T6 is specified, the stress relief by stretching may be omitted and the T6 temper supplied.

3.3.2 Wire

Rolled or cold finished, as ordered, and solution and precipitation heat treated to the T6 temper in accordance with AMS2772 (See AS1990).

3.3.3 Flash Welded Rings

Shall be manufactured in accordance with AMS7488 and solution and precipitation heat treated in accordance with AMS2772 from stock conforming to AMS4186, as ordered.

3.4 Properties

Rods 4 inches (102 mm) and under in diameter; square, hexagonal, and octagonal bar 3-1/2 inches (89 mm) and under in thickness; rectangular bar 3 inches (76 mm) and under in thickness and 6 inches (152 mm) and under in width or 10 inches (254 mm) and under in width when thickness is less than 3 inches (76 mm); and flash welded rings within the above limits of radial thickness, as applicable to the stock used, shall conform to the requirements presented in Table 2, determined on the mill produced size in accordance with AMS2355.

TABLE 2 - MINIMUM TENSILE PROPERTIES

Property	Value
Tensile Strength	77.0 ksi (531 MPa)
Yield Strength at 0.2% Offset	66.0 ksi (455 MPa)
Elongation in 4D	7%

3.5 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.

3.6 Tolerances

Bars, rods, and wire 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

4.2.1 Acceptance Tests

The following requirements are acceptance tests and except for composition, shall be performed on each lot:

4.2.1.1 Composition (3.1) of each heat.

4.2.1.2 Tensile properties (3.3) of each lot of bars, rods, wire, and flash welded rings.

4.2.1.3 Tolerances (3.5) of bars, rods, and wire.

4.2.2 Periodic Tests

Tests of stock for flash welded rings to determine ability to develop required properties (3.3) 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 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 inspection lot to determine conformance to the other acceptance test requirements. This report shall include the purchase order number, inspection lot number(s), AMS4122L, 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.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be identified as follows:

5.1.1 Bars, Rod, and Wire

In accordance with ASTM B 666/B 666M.

5.1.2 Flash Welded Rings

As agreed upon by purchaser and vendor.

5.2 Packaging

5.2.1 When specified, the product shall be oiled, prior to shipment, with a light corrosion-inhibiting oil.

The product shall be prepared for shipment in accordance with ASTM B 660 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.