The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

SAE AMS 4115F

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Superseding AMS 4115E

ALUMINUM ALLOY, ROLLED OR COLD-FINISHED, BARS, RODS, WIRE, AND FLASH WELDED RINGS

1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-0)
Annealed

UNS A96061

1. SCOPE:

1.1 Form:

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

1.2 Application:

These products have been used typically for parts requiring moderate strength, especially where such parts require brazing or welding during fabrication, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

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 2770 Heat treatment of Wrought Aluminum Alloy Parts

AMS 2811 Identification, Aluminum and Magnesium Alloy Wrought Products

AMS 7488 Rings, Flash Welded, Aluminum and Aluminum Alloys

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

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

2.4 ANSI Publications:

Available from American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002.

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products
ANSI H35.2 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
Magnesium	0.8	1.2
Silicon	0.40	0.8
Copper	0.15	0.40
Chromium	0.04	0.35
Iron	--	0.7
Zinc	--	0.25
Manganese	--	0.15
Titanium	--	0.15
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 (R) Bars, Rods, and Wire: Rolled or cold-finished, as ordered, and annealed in accordance with MIL-H-6088 to the O temper.

3.2.2 (R) Flash Welded Rings: Shall be manufactured in accordance with AMS 7488 and annealed in accordance with MIL-H-6088 to the O temper.

3.2.3 Stock for Flash Welded Rings: As ordered by the flash welded ring manufacturer.

3.3 Properties:

The product shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 Bars, Rods, Wire, and Flash Welded Rings:

3.3.1.1 As Annealed: (See 8.2).

3.3.1.1.1 Tensile Properties: Shall be as shown in Table 2 for bars, rods, and wire 8 inches (203 mm) and under in nominal diameter or least distance between parallel sides and for flash welded rings 8 inches (203 mm) and under in radial thickness.

TABLE 2 - Tensile Properties

Property	Value
Tensile Strength, maximum	22.0 ksi (152 MPa)
Elongation in 4D, minimum	18%

3.3.1.2 (R) Response to Heat Treatment: The product shall have the following properties after being solution and precipitation heat treated to the -T62 temper in accordance with the time and temperature parameters of AMS 2770.

3.3.1.2.1 Tensile Properties: Shall be as shown in Table 3 for rounds 8 inches (203 mm) and under in nominal diameter, for rectangular, square, hexagonal, and octagonal bar 8 inches (203 mm) and under in least distance between parallel sides and 50 square inches (322 cm^2) and under in cross-sectional area, and for flash welded rings 8 inches (203 mm) and under in radial thickness and 50 square inches (322 cm^2) and under in cross-sectional area.

TABLE 3 - Minimum Tensile Properties

Property	Value
Tensile Strength	42.0 ksi (290 MPa)
Yield Strength at 0.2% Offset	35.0 ksi (241 MPa)
Elongation in 4D	10%

3.3.2 Stock for Flash Welded Rings: Specimens taken from the stock after solution and precipitation heat treatment as in 3.3.1.2 shall conform to the requirements of 3.3.1.2.1.

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:

(R)

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 vendors 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 (R) Acceptance Tests: Composition (3.1), tensile properties as annealed (3.3.1.1.1), response to heat treatment tensile properties (3.3.1.2.1), and tolerances (3.5) are acceptance tests and, except for composition, shall be performed on each inspection lot.

4.2.2 (R) Periodic Tests: Tests of stock for flash welded rings to demonstrate ability to develop required properties (3.3.2) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by the purchaser.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2355 or MAM 2355.