

AEROSPACE MATERIAL SPECIFICATION

SAE AMS4115

REV. H

Issued 1960-01
Reaffirmed 2007-04
Revised 2009-07

Superseding AMS4115G

Aluminum Alloy, Rolled or Cold-Finished, Bars, Rods, Wire, and Flash
Welded Rings
Annealed

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

(Composition similar to UNS A96061)

RATIONALE

AMS4115H results from a 5 Year Review and update of this specification in order to permit supersession of AMS-QQ-A-225/8A.

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 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.

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<http://www.sae.org/technical/standards/AMS4115H>**

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
AMS7488	Rings, Flash Welded, Aluminum and Aluminum Alloys
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 10036-8002, Tel: 212-642-4900, 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 AMS2355.

3.2 Condition

The product shall be supplied in the following condition:

3.2.1 Bars, Rods, and Wire

Rolled or cold-finished, as ordered, and annealed in accordance with AMS2772 to the O temper (See AS1990).

3.2.2 Flash Welded Rings

Shall be manufactured in accordance with AMS7488 and annealed in accordance with AMS2772 to the O temper.

TABLE 1 - COMPOSITION

Element	min	max
Silicon	0.40	0.80
Iron	--	0.7
Copper	0.15	0.40
Manganese	--	0.15
Magnesium	0.8	1.2
Chromium	0.04	0.35
Zinc	--	0.25
Titanium	--	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

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 AMS2355 on the mill produced size.

3.3.1 Bars, Rods, Wire, and Flash Welded Rings

3.3.1.1 As Annealed (-O) Condition 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)
Yield Strength at 0.2% Offset, minimum	6.0 ksi (41 MPa)
Elongation in 4D, minimum	18%

3.3.1.2 After Heat Treatment to the T42 Temper

The product, as received by purchaser in the Annealed (O) or the As Fabricated (F) condition, without the subsequent imposition of cold working or forming operations, shall have the properties of Table 3, after solution heat treatment and natural aging to the T42 temper (See AS1990) in accordance with AMS2772.

3.3.1.2.1 Aging Before Testing

Specimens in the T42 tempers will not be required to be tested within 4 days after completion of the solution heat treatment. If, within this period, the manufacturer elects to test specimens, which thereupon fail to meet the requirements, they can discard these original test results and test additional specimens selected after four days of aging. These specimens shall be selected from the same location in the production lot or sample as those tested previously in accordance with AMS2355.

3.3.1.3 After Heat Treatment to the T62 Temper

The product, as received by purchaser in the Annealed (O) or the As Fabricated (F) condition, shall have the properties of Table 3, after solution heat treatment and artificial aging to the T62 temper (See AS1990) in accordance with AMS2772.

3.3.1.4 Tensile Properties After Heat Treatment

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 cm²) 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 cm²) and under in cross-sectional area.

TABLE 3 - MINIMUM TENSILE PROPERTIES

Temper	Tensile Strength ksi (MPa)	Yield Strength at 0.2% Offset ksi (MPa)	Elongation in 2 inches or 4D
T42	30.0 (207)	14.0 (97)	18
T62	42.0 (290)	35.0 (241)	10

3.3.2 Stock for Flash Welded Rings

Specimens taken from the stock after solution and precipitation heat treatment as in 3.3.1.3 shall conform to the requirements of Table 3.

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

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 Acceptance Tests

Composition (3.1), tensile properties as annealed (3.3.1.1), after solution heat treatment and natural aging (3.3.1.2), after solution heat treatment and artificial aging (3.3.1.3), and tolerances (3.5) are acceptance tests and, except for composition, shall be performed on each inspection lot.