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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4150J

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Submitted for recognition as an American National Standard

Superseding AMS 4150H

ALUMINUM ALLOY EXTRUSIONS AND RINGS
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-T6)
Solution and Precipitation Heat Treated

UNS A96061

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of extruded bars, rods, wire, shapes, and tubing, flash welded rings fabricated from extruded stock, and 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 2205 Tolerances, Aluminum Alloy and Magnesium Alloy Extrusions
MAM 2205 Tolerances, Metric, Aluminum Alloy and Magnesium Alloy Extrusions
AMS 2355 Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings
MAM 2355 Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units

2.1 SAE Publications (Cont.):

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, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products

2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

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 Bars, Rods, Wire, Shapes, and Tubing: Extruded and solution and precipitation heat treated in accordance with MIL-H-6088.

3.2.1.1 Extrusions shall be supplied with an as-extruded surface finish; light polishing to remove minor surface imperfections is permissible provided such imperfections can be removed within the dimensional tolerances.

3.2.2 Flash Welded Rings: Manufactured in accordance with AMS 7488 from extruded stock and solution and precipitation heat treated in accordance with AMS 2770.

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, Shapes, Tubing, and Flash Welded Rings:

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

TABLE 2A - Tensile Properties

Nominal Diameter or Least Thickness (See 8.2) (bars, rods, wire, shapes, and flash welded rings) or Nominal Wall Thickness (tubing) Inches	Tensile Strength ksi, min	Yield Strength at 0.2% Offset ksi, min	Elongation in 2 Inches or 4D %, min
Up to 0.250, excl	38.0	35.0	8
0.250 and over	38.0	35.0	10

TABLE 2B - Tensile Properties (SI)

Nominal Diameter or Least Thickness (See 8.2) (bars, rods, wire, shapes, and flash welded rings) or Nominal Wall Thickness (tubing) Millimeters	Tensile Strenght MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 50.8 mm or 4D %, min
Up to 6.35, excl	262	241	8
6.35 and over	262	241	10

3.3.1.2 Hardness: Should be not lower than 80 HB/10/500 or 85 HB/10/1000 but the product shall not be rejected on the basis of hardness if the tensile property requirements are met.

3.3.2 Stock for Flash Welded Rings: Specimens taken from the stock after solution and precipitation heat treatment in accordance with AMS 2770 shall conform to the requirements of 3.3.1.1 and 3.3.1.2.

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, wire, shapes, and tubing shall conform to all applicable requirements of AMS 2205 or MAM 2205.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:
(R)

The vendor of the product shall supply all samples for vendor's tests and shall be reponsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for composition (3.1), tensile properties (3.3.1.1), and tolerances (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests for hardness (3.3.1.2) 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:
(R)

Shall be in accordance with AMS 2355 or MAM 2355.

4.4 Reports:

4.4.1 (R) The vendor of extrusions or flash welded rings shall furnish with each shipment a report stating that the extrusions or flash welded rings conform to the chemical composition and other acceptance test requirements. This report shall include the purchase order number, lot number, AMS 4150J, size or section identification number, and quantity.