AEROSPACE MATERIAL SPECIFICATION

AMS4150™	REV. P

Issued 1944-03
Reaffirmed 2008-05
Revised 2024-03

Superseding AMS4150N

Aluminum Alloy, Extrusions and Rings, 1.0Mg - 0.60Si - 0.28Cu - 0.20Cr - (6061-T6), Solution and Precipitation Heat Treated

(Composition similar to UNS A96061)

RATIONALE

AMS4150P results from a Five-Year Review and update of this specification with changes to update numbering of tables and wording to prohibit unauthorized exceptions (see 8.5), relocate Definitions (see 2.4), remove obsolete weight criteria from Ultrasonic Inspection (see 3.4.1), and update Applicable Documents (see Section 2), Hardness (see 8.2), and Ordering Information (see 8.6).

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of extruded bars, rods, wire, profiles, and tubing, flash-welded rings fabricated from extruded stock, and stock for flash-welded rings (see 8.6).

1.1.1 Tubing

Tubing shall be additionally classified a follows:

Table 1

Type	Description
I	Seamless tubing extruded from hollow billets using die and mandrel
II	Tubing extruded from solid billets using porthole or spider die or similar tooling

When no type is specified, Type I shall apply (see 8.6).

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.

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**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4150P

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 +1 724-776-4970 (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

AS7766 Terms Used in Aerospace Metals Specifications

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 B594 Ultrasonic Inspection of Aluminum-Alloy Wrought Products

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

ASTM B807/B807M Extrusion Press Solution Heat Treatment for Aluminum Alloys

2.3 ANSI Accredited Publications

Copies of these documents are available online at https://webstore.ansi.org/.

ANSI H35.1/H35.1M Standard Alloy and Temper Designation System For Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

ANSI H35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

2.4 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 2, determined in accordance with AMS2355.

Table 2 - Composition

Element	Min	Max
Silicon	0.40	0.8
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 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 to the T6 temper (refer to ANSI H35.1/H35.1M).

3.2.2 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 specified dimensional tolerances.

3.2.3 Heat treatment shall be classified as follows:

Table 3

Class	Description
1	Furnace solution heat treated in accordance with AMS2772 and precipitation heat treated in accordance with AMS2772
2	Extruded and press solution heat treated in accordance with ASTM B807/B807M and precipitation heat treated in accordance with AMS2772

If no class is specified, either class may be provided (see 8.6).

3.2.4 Flash-Welded Rings

Manufactured in accordance with AMS7488 from extruded stock and solution and precipitation heat treated to the T6 temper in accordance with AMS2772.

3.2.5 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 on the mill produced size in accordance with AMS2355 (see 8.2):

3.3.1 Bars, Rods, Wire, Profiles, Tubing, and Flash-Welded Rings

3.3.1.1 Tensile Properties

Shall be as shown in Table 4.

Table 4A - Minimum tensile properties, inch/pound units

Nominal Diameter or Least Thickness (see 8.3) (Bars, Rods, Wire, Shapes, and Flash-Welded Rings) or Nominal Wall Thickness (Tubing) Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
Up to 0.250, excl	38.0	35.0	8
0.250 and over	38.0	35.0	10

Table 4B - Minimum tensile properties, SI units

Nominal Diameter or Least Thickness (see 8.3) (Bars, Rods, Wire, Shapes, and Flash-Welded Rings) or Nominal Wall Thickness (Tubing) Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Up to 6.35, excl	262	241	8
6.35 and over	262	241	10

3.3.2 Stock for Flash-Welded Rings

Specimens taken from the stock after solution and precipitation heat treatment in accordance with AMS2772 shall conform to the requirements of 3.3.1.1.

3.4 Quality

Extrusions, as received by the purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the extrusions.

3.4.1 When specified, extrusions shall be subjected to ultrasonic inspection in accordance with ASTM B594. Extrusions, 0.50 inch (12.7 mm) and over in nominal diameter or least distance between parallel sides, not exceeding a 10:1 width-to-thickness ratio, shall meet ultrasonic Class B (see 8.6).

3.5 Tolerances

Bars, rods, wire, profiles, and tubing shall conform to all applicable requirements of ANSI H35.2 or ANSI H35.2M.

3.6 Exceptions

Any exception shall be authorized by the purchaser and reported as in 4.4.1.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.