



# AEROSPACE MATERIAL SPECIFICATION

AMS4248™

REV. D

Issued	1987-01
Reaffirmed	2000-10
Revised	2018-07

Superseding AMS4248C

Aluminum Alloy Hand Forgings and Rolled Rings  
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-T652)  
Solution Heat Treated, Stress Relief Compressed, and Precipitation Heat Treated  
(Composition similar to UNS A96061)

## RATIONALE

AMS4248D introduces Exceptions (3.6), revises Condition (3.2), Properties (3.3.1.4), and Reports (4.4), and results from a Five-Year Review and update of this specification.

### 1. SCOPE

#### 1.1 Form

This specification covers an aluminum alloy in the form of hand forgings up to 8 inches, incl (203 mm, incl) in nominal thickness, and rolled rings up to 3.5 inches, incl (89 mm, incl) in nominal thickness (see 8.5).

#### 1.2 Application

These products have been used typically for complex shaped parts requiring moderate strength and good forgeability of the alloy and where stability is required during machining, but usage is not limited to such applications. Corrosion resistance of this alloy is superior to that of aluminum alloys having copper as the principal alloying element.

### 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](http://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

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SAE values your input. To provide feedback on this  
Technical Report, please visit  
<http://standards.sae.org/AMS4248D>

AMS2808 Identification, Forgings

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

## 2.2 ANSI Accredited Publications

Copies of these documents are available online at <http://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)

## 2.3 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](http://www.astm.org).

ASTM B594 Ultrasonic Inspection of Aluminum-Alloy Products for Aerospace Applications

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM E10 Brinell Hardness of Metallic Materials

ASTM E1417/E1417M Liquid Penetrant Testing

## 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	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	--	0.05
Other Elements	--	0.15
Aluminum	remainder	

### 3.2 Condition

Solution heat treated, stress relieved by compression to produce 1 to 5% permanent set, and precipitation heat treated. Heat treatments shall be performed in accordance with AMS2772 to the T652 temper (refer to ANSI H35.1/H35.1M).

3.2.1 Forging stock shall be as ordered by the producer or the forging 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 Tensile Properties

Shall be as follows:

## 3.3.1.1 Hand Forgings

Specimens, machined from forgings having an essentially square or rectangular cross-section heat treated in the indicated thickness, shall have the properties shown in Tables 2A or 2B provided the as-forged thickness does not exceed 8 inches (203 mm) and the cross-sectional area is not over 256 in<sup>2</sup> (1652 cm<sup>2</sup>).

**Table 2**

**Table 2A - Minimum tensile properties, hand forgings, inch/pound units**

Nominal Thickness at Time of Heat Treatment Inches	Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
Up to 2, incl	Longitudinal	38.0	35.0	10
	Long.-Trans.	38.0	35.0	8
Over 2 to 4, incl	Longitudinal	38.0	35.0	10
	Long.-Trans.	38.0	35.0	8
	Short-Trans.	37.0	33.0	5
Over 4 to 8, incl	Longitudinal	37.0	34.0	8
	Long.-Trans.	37.0	34.0	6
	Short-Trans.	35.0	32.0	4

**Table 2B - Minimum tensile properties, hand forgings, SI units**

Nominal Thickness at Time of Heat Treatment Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Up to 51, incl	Longitudinal	262	241	10
	Long.-Trans.	262	241	8
Over 51 to 102, incl	Longitudinal	262	241	10
	Long.-Trans.	262	241	8
	Short-Trans.	255	228	5
Over 102 to 203, incl	Longitudinal	255	234	8
	Long.-Trans.	255	234	6
	Short-Trans.	241	221	4

## 3.3.1.2 Rolled Rings

Specimens, machined in the indicated orientation from rings 3.5 inches (89 mm) and under in nominal thickness at time of heat treatment and having an OD-to-wall thickness ratio of 10:1 or greater, shall have the properties show in Tables 3A or 3B.