



AEROSPACE MATERIAL SPECIFICATION

AMS4127™

REV. K

Issued	1954-05
Reaffirmed	2012-09
Revised	2019-02

Superseding AMS4127J

Aluminum Alloy, Forgings and Rolled or Forged Rings
(6061-T6)
Solution and Precipitation Heat Treated
(Composition similar to UNS A96061)

RATIONALE

AMS4127K prohibits unauthorized exceptions (3.6), revises condition (3.2.1), properties (3.3.1.1.5), 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 die forgings not over 4 inches (102 mm) in nominal thickness at time of heat treatment, hand forgings with as-forged thickness not exceeding 8 inches (203 mm) and the cross-sectional area not greater than 256 in², forged or rolled 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, and stock of any size for forgings and rings (see 8.6).

1.2 Application

These products have been used typically for complex, shaped parts requiring moderate strength and good forgeability of the material, but usage is not limited to such applications. Corrosion resistance of this alloy is superior to that of 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.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2019 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

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
http://www.sae.org

SAE WEB ADDRESS:

**SAE values your input. To provide feedback on this
Technical Report, please visit
<http://standards.sae.org/AMS4127K>**

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
AMS2808	Identification Forgings
ARP1917	Clarification of 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 for Aerospace Applications
ASTM E10	Brinell Hardness of Metallic Materials
ASTM E1417/E1417M	Liquid Penetrant Testing

2.3 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)

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, 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 Die Forgings, Hand Forgings, and Rolled or Forged Rings

Solution and precipitation heat treated in accordance with AMS2772 to the T6 temper (see ANSI H35.1/H35.1M).

3.2.2 Forging Stock

As ordered by purchaser.

3.3 Properties

The product shall conform to the following requirements, determined in accordance with AMS2355:

3.3.1 Die Forgings, Hand Forgings, and Rolled or Forged Rings

3.3.1.1 Tensile Properties

Shall be as follows:

3.3.1.1.1 Die Forgings

Shall have the properties shown in Table 2 with tensile specimens machined from forgings not over 4 inches (102 mm) in nominal thickness at time of heat treatment with axis of specimens as follows:

3.3.1.1.1.1 With Grain Flow

Axis of grain flow in area of gage length varying not more than 15 degrees from parallel to the forging flow lines.

3.3.1.1.1.2 Across Grain Flow

Axis of grain flow in area of gage length varying not more than 15 degrees from perpendicular to the forging flow lines.

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

Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D %
With Grain Flow	38.0	35.0	7
Across Grain Flow	38.0	35.0	5

Table 2B - Minimum tensile properties, SI units

Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 4D %
With Grain Flow	262	241	7
Across Grain Flow	262	241	5

3.3.1.1.2 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 Table 3 provided the as-forged thickness does not exceed 8 inches (203 mm) and the cross-sectional area is not over 256 in² (1652 cm²).