AEROSPACE MATERIAL SPECIFICATION

AMS4141™ REV. H

Issued 1966-03
Reaffirmed 2006-04
Revised 2021-04

Superseding AMS4141G

Aluminum Alloy Die Forgings
5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T73)
Solution and Precipitation Heat Treated
(Composition similar to UNS A97075)

RATIONALE

AMS4141H prohibits unauthorized exceptions (3.6, 4.4.1.1, 8.7), revises condition (3.2.1), allows use of immediate prior document revision (8.6), provides SI 5D tensile elongation values (Table 2, Table 3, 8.5), 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 up to 6 inches in thickness and forging stock of any size ordered to inch/pound units (see 8.8).

1.2 Application

These forgings have been used typically for parts requiring good resistance to stress-corrosion cracking but with lower strength than AMS4126, 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.

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 Alloys, Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings
AMS2772	Heat Treatment of Aluminum Alloy Raw Materials

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/AMS4141H

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 Products

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

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 Systems for Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

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
Iron	--	0.50
Copper	1.2	2.0
Manganese	--	0.30
Magnesium	2.1	2.9
Chromium	0.18	0.28
Zinc	5.1	6.1
Titanium	--	0.20
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 Forgings

Solution and precipitation heat treated to the -T73 temper in accordance with AMS2772 (refer to ANSI H35.1/H35.1M).

3.2.2 Forging Stock

As ordered by the forging manufacturer.

3.3 Properties

The product shall conform to the following requirements, determined in accordance with AMS2355 on the mill produced size. Mechanical properties for product outside the range covered by 1.1 shall be agreed upon between purchaser and producer.

3.3.1 Forgings

3.3.1.1 Tensile Properties

Shall be as follows:

3.3.1.1.1 With Grain Flow

Specimens, machined from forgings 6 inches and under in nominal thickness at time of heat treatment or from prolongations on such forgings, with axis of specimen in the area of gage length varying not more than 15 degrees from parallel to the forging flow lines, shall have properties specified in Table 2 provided the as-forged thickness is not more than twice the heat treated thickness.

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

Nominal Thickness at Time of Heat Treatment Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %, min
Up to 3, incl	66.0	56.0	7
Over 3 to 4, incl	64.0	55.0	7
Over 4 to 5, incl	62.0	53.0	7
Over 5 to 6, incl	61.0	51.0	6

Table 2B - Minimum tensile properties, SI units

Nominal Thickness at Time of Heat Treatment Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 5D %, min
Up to 76, incl	455	386	6
Over 76 to 102, incl	441	379	6
Over 102 to 127, incl	427	365	6
Over 127 to 152, incl	421	352	5

3.3.1.1.2 Across Grain Flow

Specimens, machined from forgings 6 inches and under in nominal thickness at time of heat treatment or from prolongations on such forgings, with axis of specimen in the area of gage length varying not more than 15 degrees from perpendicular to the forging flow lines, shall have properties as specified in Table 3, provided the as-forged thickness is not more than twice the heat treated thickness. If configuration of the forging or prolongation cannot accommodate the transverse specimen described, properties of the forgings shall be as agreed upon by purchaser and producer.