



AEROSPACE MATERIAL SPECIFICATION

AMS4456™

REV. A

Issued 2012-05

Revised 2019-11

Superseding AMS4456

Aluminum Alloy, Hand Forgings
8.0Zn - 1.0Cu - 1.6Mg - 0.12Zr (7037-T7452)
Solution Heat Treated, Compression Stress Relieved, and Overaged
(Composition similar to UNS A97037)

RATIONALE

AMS4456A prohibits unauthorized exceptions (3.5), revises Condition (3.2.1), Properties (Table 2B, 3.3.1.2.3, 3.3.1.6), Quality (3.4.1.1), 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 11.000 inches (280 mm) and under in nominal thickness and of forging stock of any size (see 8.6).

1.2 Application

These forgings have been used typically for machined structural parts subject to warpage during machining and requiring high strength and resistance to stress-corrosion cracking, 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.

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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
- ASTM B645 Linear-Elastic Plane Strain Fracture Toughness Testing of Aluminum Alloys
- ASTM B660 Packaging/Packing of Aluminum and Magnesium Products
- ASTM E399 Linear-Elastic Plane-Strain Fracture Toughness K_{Ic} of Metallic Materials
- ASTM G34 Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)
- ASTM G47 Determining Susceptibility to Stress Corrosion Cracking of 2XXX and 7XXX Aluminum Alloys

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	--	0.10
Iron	--	0.10
Copper	0.6	1.1
Manganese	--	0.50
Magnesium	1.3	2.1
Chromium	--	0.04
Zinc	7.8	9.0
Titanium	--	0.10
Zirconium	0.06	0.25
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

Heat treatment shall be in accordance with AMS2772 to the -T7452 temper (refer to ANSI H35.1/H35.1M) and as follows: Solution heat treatment and artificial aging practices are proprietary. Material shall be stress-relieved by compressing to produce a 1 to 5% permanent set prior to artificial aging.

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.

3.3.1 Forgings

3.3.1.1 Tensile Properties

Specimens machined from forgings having essentially a rectangular or square cross-section, heat treated in the indicated thickness, shall have the properties shown in Table 2 provided that the as-forged thickness does not exceed 11.000 inches (280 mm). The long-transverse direction for square forgings shall be identified by the producer.