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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE MAM 4323A

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Superseding MAM 4323

Submitted for recognition as an American National Standard

ALUMINUM ALLOY, HAND FORGINGS
5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T7452)
Solution Heat Treated, Stress Relieved, and Precipitation Heat Treated

UNS A97075

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of hand forgings procured to metric dimensions.

1.1.1 AMS 4323A is the inch/pound version of this MAM.

1.2 Application:

These forgings have been used typically for parts requiring a high level of mechanical properties and good resistance to stress-corrosion cracking, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

MAM 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units

AMS 2808 Identification, Forgings

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 594 Ultrasonic Inspection of Aluminum-Alloy Wrought Products for Aerospace Applications
ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined in accordance with MAM 2355.

TABLE 1 - Composition

Element	min	max
Zinc	5.1	6.1
Magnesium	2.1	2.9
Copper	1.2	2.0
Chromium	0.18	0.28
Iron	--	0.50
Silicon	--	0.40
Manganese	--	0.30
Titanium	--	0.20
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Solution heat treated, stress relieved by compressing to produce a permanent set of 1 to 5%, and precipitation heat treated to the T7452 temper. Heat treatments shall be performed in accordance with MIL-H-6088 but cycles may require modification to achieve required properties.

3.3 Properties:

Forgings shall conform to the following requirements, determined in accordance with MAM 2355:

3.3.1 Tensile Properties: Shall be as specified in Table 2, determined on specimens machined from forgings not over 150 mm in nominal as-forged thickness and having an essentially rectangular or square cross-section not exceeding 1005 cm^2 in area and heat treated in the indicated thickness.

TABLE 2 - Minimum Tensile Properties

Nominal Thickness At Time of Heat Treatment Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 4D %
Up to 50, incl	Longitudinal	490	420	9
	Long-Trans.	475	400	5
Over 50 to 75, incl	Longitudinal	490	420	9
	Long-Trans.	475	400	5
	Short-Trans.	460	370	4
Over 75 to 100, incl	Longitudinal	475	400	9
	Long-Trans.	470	385	5
	Short-Trans.	455	350	4
Over 100 to 125, incl	Longitudinal	450	370	8
	Long-Trans.	440	360	5
	Short-Trans.	435	340	4
Over 125 to 150, incl	Longitudinal	435	350	8
	Long-Trans.	420	340	5
	Short-Trans.	415	315	4

3.3.1.1 (R) The axis of longitudinal specimens in area of gage length shall vary not more than 15 degrees from parallel to the forging flow lines. The axis of transverse specimens in area of gage length shall vary not more than 15 degrees from perpendicular to the forging flow lines.

3.3.2 Stress-Corrosion Resistance: Forgings shall meet the conductivity test of 3.3.2.1 and shall exhibit no evidence of stress-corrosion cracking when tested in accordance with 3.3.2.2. The test of 3.3.2.2 need not be performed on forgings meeting the requirements of 3.3.2.1.1 or 3.3.2.1.2.

3.3.2.1 Conductivity: Shall be as follows, determined on the surface of the sample:

3.3.2.1.1 If the conductivity is 23.2 MS/m or higher and longitudinal tensile properties meet specified requirements, the forgings are acceptable.

3.3.2.1.2 (R) If the conductivity is 22.0 to 23.1 MS/m, if the longitudinal tensile properties meet specified properties, and if the longitudinal yield strength does not exceed the specified minimum by more than 82 MPa, the forgings are acceptable.

3.3.2.1.3 If the conductivity is between 22.0 to 23.1 MS/m and longitudinal yield strength exceeds the specified minimum value by more than 82 MPa, the forgings shall be given additional precipitation heat treatment. If, after such treatment, the forgings meet the requirements of 3.3.1 and 3.3.2.1.1 or 3.3.2.1.2, the forgings are acceptable.

3.3.2.1.4 If the conductivity is below 22.0 MS/m, the forgings are not acceptable but may be reheat treated to meet specified requirements.

3.3.2.2 Stress-Corrosion Cracking Resistance: Specimens cut from forgings shall show no evidence of stress-corrosion cracking when stressed in the short-transverse direction at 240 MPa for forgings 75 mm and under in least section thickness or to 50% of the specified minimum longitudinal yield strength for forgings over 75 mm in section thickness.

3.4 Quality:

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

3.4.1 All forgings shall be subjected to ultrasonic inspection in accordance with ASTM B 594 and shall meet Ultrasonic Class A.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of forgings shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the forgings conform to specified requirements.

4.2 Classification of Tests:

4.2.1 (R) Acceptance Tests: Composition (3.1), tensile properties (3.3.1), conductivity (3.3.2.1), and ultrasonic soundness (3.4.1) are acceptance tests and, except for composition, shall be performed on each lot.

4.2.2 Periodic Tests: Stress-corrosion cracking resistance (3.3.2.2) is a periodic test and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.