

AEROSPACE MATERIAL SPECIFICATIONS

AMS 4132A

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

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ALUMINUM ALLOY FORGINGS

2.3Cu - 1.6Mg - 1.1Fe - 1.1Ni - 0.07Ti (2618-T61)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. FORM: Die forgings, rolled rings, hand forgings, and forging stock.
3. APPLICATION: Primarily for rotor parts operating at temperatures up to 450 F and other parts operating up to 600 F at low stresses.

4. COMPOSITION:

Copper	1.9 - 2.7
Magnesium	1.3 - 1.8
Iron	0.9 - 1.3
Nickel	0.9 - 1.2
Titanium	0.04 - 0.10
Silicon	0.25 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

5. CONDITION:

- 5.1 Die Forgings, Rolled Rings, and Hand Forgings 4 in. and Under in Thickness: Unless otherwise specified, solution and precipitation heat treated. Forgings shall be solution heat treated by heating to 985 F \pm 10, holding at heat for not less than 6 hr, and quenching in boiling water and shall then be precipitation heat treated by heating to 390 F \pm 5, holding at heat for approximately 20 hr, and cooling in air.
- 5.2 Hand Forgings Over 4 in. in Thickness: As forged, unless otherwise specified.
- 5.3 Forging Stock: As fabricated.

6. TECHNICAL REQUIREMENTS:

6.1 Die Forgings and Rolled Rings:

6.1.1 Tensile Properties:

- 6.1.1.1 Test Specimens: Test specimens machined from separately forged coupons or from forging stock representing the forgings and in either case heat treated with the forgings, or machined from prolongations on heat treated die forgings, shall conform to the following requirements:

6.1.1.1 Test Specimens: (Continued)

Tensile Strength, psi	58,000 min
Yield Strength at 0.2% Offset or at 0.0130 in.	
in 2 in. Extension Under Load (E = 10,700,000), psi	48,000 min
Elongation, % in 4D	6 min

6.1.1.2 Die Forgings, With Grain Flow: When test specimens are machined from forgings not over 4 in. in thickness with the axis approximately parallel to the forging flow lines, the tensile properties shall conform to those specified in 6.1.1.1, except that elongation may be as low as 4%, unless otherwise agreed upon by purchaser and vendor.

6.1.1.3 Die Forgings, Across Grain Flow: When test specimens are machined from die forgings not over 4 in. in thickness so that the axis is other than approximately parallel to the forging flow lines, the tensile properties shall conform to the following requirements:

Tensile Strength, psi	55,000 min
Yield Strength at 0.2% Offset or at 0.0124 in.	
in 2 in. Extension Under Load (E = 10,700,000), psi	45,000 min
Elongation, % in 4D	4 min

6.1.1.3.1 The elongation requirement applies only to test specimens having a gage length diameter not less than 0.25 in. and cut so that the length of the specimen is in a plane parallel to the parting plane.

6.1.1.3.2 If any individual specimen fails to meet the requirements of 6.1.1.3, two additional specimens shall be cut from adjacent areas in the same forging or from the same area in two additional forgings. Should either of these specimens fail to meet the values specified in 6.1.1.3, the entire lot may be rejected.

6.1.1.4 Rolled Rings, Tangential: When test specimens are machined from rolled rings not over 4 in. in thickness with axis tangential to ring OD (axis parallel to direction of rolling), the tensile properties shall conform to the following requirements, unless otherwise agreed upon by purchaser and vendor.

Tensile Strength, psi,	55,000 min
Yield Strength at 0.2% Offset or at 0.0116 in.	
in 2 in. Extension Under Load (E = 10,700,000), psi	41,000 min
Elongation, % in 4D	6 min

6.1.1.5 Rolled Rings Axial: When test specimens are machined from rolled rings not over 4 in. in thickness with axis parallel to axis of ring (axis transverse to direction of rolling), the tensile properties shall conform to those specified in 6.1.1.4, except that elongation may be as low as 5%, unless otherwise agreed upon by purchaser and vendor.

6.1.2 Hardness: Forgings shall have hardness not lower than Brinell 115 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 120 using 1000 kg load and 10 mm ball.

6.2 Forging Stock:

6.2.1 When a sample of stock is forged to a test coupon and heat treated in the same manner as forgings, a tensile test specimen taken from the heat treated coupon shall have properties not lower than those specified in 6.1.1.1 and 6.1.2. If a test specimen taken from the stock after heat treatment in the same manner as forgings has properties not lower than those specified in 6.1.1.1 and 6.1.2, the test shall be accepted as equivalent to the test of a forged coupon. Neither of these tests is required in routine inspection.

6.2.2 Unless otherwise specified, tolerances shall be in accordance with the latest issue of AMS 2201 for the class ordered.

7. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of forgings shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and technical requirements of this specification. This report shall include the purchase order number, material specification number, size or part number, and quantity.

8.2 Unless otherwise specified, the vendor of forging stock shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition of this specification. This report shall include the purchase order number, material specification number, size or part number, and quantity.

8.3 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

9. IDENTIFICATION:

9.1 Die Forgings and Rolled Rings: Shall be identified in accordance with the latest issue of AMS 2808.

9.2 Hand Forgings: Shall be marked with the alloy designation and temper designation, the characters recurring at intervals not exceeding 6 inches. The marking shall be in the longitudinal grain direction.

9.3 Forging Stock: Shall be identified as agreed upon by purchaser and vendor.