# AERONAUTICAL MATERIAL SPECIFICATIONS

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

**AMS 4125E**

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## ALUMINUM ALLOY FORGINGS
## 1Si - 0.6Mg - 0.25Cr (6151-T6)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. FORM: Forgings and forging stock.

3. COMPOSITION:

| | |
|---|---|
| Silicon | 0.6 - 1.2 |
| Magnesium | 0.45 - 0.8 |
| Chromium | 0.15 - 0.35 |
| Iron | 1.0 max |
| Copper | 0.35 max |
| Zinc | 0.25 max |
| Manganese | 0.20 max |
| Titanium | 0.15 max |
| Other Impurities, each | 0.05 max |
| Other Impurities, total | 0.15 max |
| Aluminum | remainder |

4. CONDITION:

4.1 Die Forgings and Rolled Rings: Solution and precipitation heat treated. Quenching from the solution temperature shall be at a rate fast enough for the material to meet the following requirements, but shall be as slow as practicable in order to keep internal stresses at a minimum.

4.2 Forging Stock: As fabricated.

5. TECHNICAL REQUIREMENTS:

5.1 Die Forgings and Rolled Rings:

5.1.1 Tensile Properties:

5.1.1.1 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:

| | |
|---|---|
| Tensile Strength, psi | 44,000 min |
| Yield Strength at 0.2% Offset or at 0.0113 in. in 2 in. Extension Under Load (E = 10,100,000), psi | 37,000 min |
| Elongation, % in 4D | 14 min |








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5.1.1.2 Die Forgings, With Grain Flow: When test specimens are machined from die forgings with the axis approximately parallel to the forging flow lines, the tensile properties shall conform to those specified in 5.1.1.1, except that elongation may be as low as 10.0%, unless otherwise agreed upon by purchaser and vendor.

5.1.1.3 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
ø approximately parallel to the forging flow lines, the tensile properties shall conform to the following requirements:

| | |
|---|---|
| Tensile Strength, psi | 44,000 min |
| Yield Strength at 0.2% Offset or at 0.0113 in. in 2 in. Extension Under Load (E = 10,100,000), psi | 37,000 min |
| Elongation, % in 4D | 6 min |

5.1.1.4 Rolled Rings, Tangential: When test specimens are machined from rolled rings not over 2-1/2 in. in thickness with axis tangential to the ring OD (axis parallel to direction of rolling), the tensile properties shall
ø conform to those specified in 5.1.1.1, except that elongation may be as low as 5%, unless otherwise agreed upon by purchaser and vendor.

5.1.1.5 Rolled Rings, Axial: When test specimens are machined from rolled rings not over 2-1/2 in. in thickness with axis parallel to axis of ring (axis
ø transverse to direction of rolling), the tensile properties shall conform to the following requirements:

| | |
|---|---|
| Tensile Strength, psi | 42,000 min |
| Yield Strength at 0.2% Offset or at 0.0109 in. in 2 in. Extension Under Load (E = 10,100,000), psi | 35,000 min |
| Elongation, % in 4D | 4 min |

5.1.2 Hardness: Forgings shall have hardness not lower than Brinell 90 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 96 using 1000 kg load and 10 mm ball.

5.2 Forging Stock:

5.2.1 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 5.1.1.1 and 5.1.2. 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 5.1.1.1 and 5.1.2, the test shall be accepted as equivalent to the test of a forged coupon. Neither of these tests is required in routine inspection.

5.2.2 Unless otherwise specified, tolerances shall be in accordance with the latest issue of AMS 2201.

6. 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.