

# AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.  
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## ALUMINUM ALLOY FORGINGS 4.5 Cu - .9 Si - .8 Mn 25S-T

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 and stock for forgings.

3. COMPOSITION:

Copper	3.9 - 5.0
Silicon	0.5 - 1.2
Manganese	0.4 - 1.2
Iron	1.00 max
Zinc	0.25 max
Titanium	0.15 max
Chromium	0.10 max
Magnesium	0.05 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

4. CONDITION: (a) 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 the internal stresses at a minimum.

(b) Tensile test specimens, machined after heat treatment from separately forged coupons or from forging stock representing the forgings and heat treated with the forgings, or machined from prolongations on the heat-treated forgings, shall conform to the following minimum physical properties:

Tensile Strength, psi	55,000
Yield Strength (0.2% Offset), psi	30,000
Equivalent Extension Under Load, inch in 2 in.	0.0098
Elongation, % in 4D	16

(c) When tensile test specimens are machined from heat-treated forgings with the axis approximately parallel to the forging flow lines, the physical properties shall conform to those specified in (b) above, except that elongation may be as low as 11.0%, unless otherwise agreed between purchaser and vendor.

(d) When the drawing or purchase order specifies "special processing", minimum physical properties of tensile test specimens cut from forgings in directions other than parallel to the forging flow lines shall be as specified on the drawing or as agreed between purchaser and vendor.

(e) Heat-treated forgings and test specimens shall have hardness not lower than Brinell 100, using 500 kg load and 10 mm ball or the equivalent, or not lower than Brinell 106, using 1000 kg load and 10 mm ball.

5. STOCK FOR FORGING: (a) The composition shall conform to that of section 3 above.

(b) When a sample of the stock is forged to a test coupon, a test specimen taken from the coupon after proper heat treatment shall show the