AERONAUTICAL MATERIAL SPECIFICATION

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ALUMINUM ALLOY FORGINGS

Silicon Magnesium Chromium (A51S-T)

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

2. COMPOSITION:

Silicon	0.60 - 1.20
Magnesium	0.45 - 0.80
Chromium	0.15 - 0.35
Iron	1.00 max
Manganese	0.20 max
Copper	0.35 max
Zinc	0.25 max
Titanium	0.15 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

3. CONDITION: (a) Quenched and aged.- The quenching rate shall be fast enough for the material to meet the following requirements, but must 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 representing the forgings and heat treated with the forgings, or machined after heat treatment from prolongations on the forgings, shall conform to the following minimum physical properties:

Tensile Strength, psi	44,000
Yield Strength (Offset 0.2%),	34,000
Equivalent Extension Under Load, inch in 2 in.	0.0106
Elongation, % in 4D	12

(c) When tensile test specimens are machined from heat treated forgings with the axis approximately parallel to the forging flow lines, the minimum physical properties shall conform to the minimum physical properties specified in 3(b), except that elongation may be as low as 8.5%, unless otherwise agreed between purchaser and vendor.

(d) Heat treated forgings and tensile test specimens shall have a hardness of not less than Brinell 90, using 500 kg load and 10 mm ball or the equivalent, or not less than Brinell 96, using 1000 kg load and 10 mm ball.

4. QUALITY: Forgings shall be uniform in quality and temper, free from blisters, fins, seams, laps, segregations, and other defects which adversely affect their strength, use, or machinability. They are subject to coarse etching and any other tests necessary to insure high quality. If material defects are revealed while machining the parts, the forgings are subject to rejection.