AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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ALUMINUM ALLOY FORGINGS

Copper Nickel Magnesium (18S-T)

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

2. FORM: Forgings primarily for pistons, or as ordered.

3. COMPOSITION:

Copper	3.5 - 4.5
Nickel	1.7 - 2.3
Magnesium	0.45- 0.9
Iron	1.0 max
Silicon	0.9 max
Manganese	0.2 max
Zinc	0.25max
Chromium	0.10max
Other Impurities, each	0.05max
Other Impurities, total	0.15max
Aluminum	remainder

4. CONDITION: (a) Quenched and aged. The quenching rate shall not be faster than that of boiling water.

(b) Tensile test bars may be machined from a portion of the purchased material parallel to the direction of metal flow, or from separately forged coupons from the same lot and heat treated with the forgings which they represent. These test bars shall conform to the following minimum physical properties:

Tensile Strength, lb per sq in.	55,000
Yield Strength (0.2% Set), lb per sq in.	40,000
Equivalent Extension Under Load, inch in 2 in.	0.0118
Elongation, % in 2 in.	10
Brinell Hardness	100

(c) Forgings shall have a hardness of not less than Brinell 100, or the equivalent.

(d) Pistons, after rough machining, shall be capable of being heated at 450°F for 5 hours and retaining a hardness of not less than Brinell 90, using 500 Kg load and the 10 mm ball, or the equivalent, or not less than Brinell 93, using 1000 Kg load and the 10 mm ball.

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

6. REPORTS: The manufacturer shall furnish three copies of a notarized report stating that the physical properties and chemical composition of the material are within the requirements specified. This report shall include the purchase order number, material specification number, size or part number, and quantity.