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## AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.

29 West 39th Street

New York City

AMS

4212

### CAST ALUMINUM ALLOY 5% Silicon (Solution and Precipitation)

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

Silicon	4.5 - 5.5
Copper	1.0 - 1.5
Magnesium	0.4 - 0.6
Titanium or Chromium	0.08 - 0.20
Iron	0.5 max
Manganese	0.05 max
Zinc	0.03 max
Other Impurities, each	0.05 max
Aluminum	remainder
3. **CASTING:** (a) All the metal which is melted for castings shall be ingot conforming to section 2; gates, risers and rejected castings may be used but shall first be converted into such ingot.

(b) During melting, the metal shall be heated to not over 1500°F. The metal being poured into the mold shall not exceed a temperature of 1450°F. Written permission must be obtained from the purchaser by letter or by revising the physical properties on the drawing before deviating from the requirements of this paragraph.

(c) The molten metal for making test bars of the standard size for testing shall be taken from the same melt as the castings immediately before or after the metal for the castings is taken. The test bars shall be poured at the temperature of pouring the castings. The mold shall be made with the regular foundry mix of green sand without using chills.
4. **HEAT TREATMENT:** (a) The test bars, together with the castings which they represent, shall be heated to the required temperature and time for the solution treatment, and quenched in water which is boiling before the quench.

(b) The castings and test bars, after the solution treatment as in paragraph 4(a) shall be heated uniformly to a minimum temperature of 300°F, held at heat for at least 1-1/2 hours and cooled in air. The hardness shall then be 65 - 95 Brinell.
5. **TEST BARS:** (a) Three tensile test bars shall be supplied, unless otherwise specified, with each melt of castings. It is not necessary to pull more than one of these test bars unless the first one fails to meet the specification requirements, in which case the remaining two must meet the requirements before acceptance of the melt. A melt shall mean a furnace charge (1000 pounds maximum) of metal as melted for pouring castings.

(b) Unless otherwise specified or noted on the drawing, tension test bars poured and treated as specified in sections 3 and 4 shall have the following minimum physical properties:

Tensile Strength, lb per sq in 32,000

Elongation, % in 2 in 2