AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 4286

Issued 11-1-54
Revised

ALUMINUM ALLOY CASTINGS, PERMANENT MOLD
7Si - 0.3Mg (356-T51)

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

2. COMPOSITION:

Silicon	6.5 - 7.5
Magnesium	0.20 - 0.40
Iron	0.6 max
Manganese	0.30 max
Zinc	0.30 max
Copper	0.20 max
Titanium	0.20 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

3. CONDITION: Artificially aged without prior solution heat treatment.

4. TECHNICAL REQUIREMENTS:

4.1 Casting:

4.1.1 A lot of castings shall consist of not more than 1000 lb of cleaned castings of the same part number, produced in a pouring period of not more than 8 consecutive hr from molten metal consisting of ingot from a single heat, and gates, risers and defective castings from that heat of ingot. When the lot is changed by reason of a change in the heat of ingot used in a remelting or holding pot, foundry scrap from the preceding lot may be used.

4.1.2 Castings, after removal from molds, shall be cooled at rates which will be as uniform as practicable for castings of each part number.

4.2 Test Specimens: Tensile test specimens, and chemical analysis specimens when required, shall be cast with each lot of castings, and when requested, shall be supplied with the castings.

4.2.1 Tensile Test Specimens: Shall be standard (0.5 in. diameter at the reduced parallel section) and shall be cast to size in permanent molds. Metal for the specimens shall be part of the melt which is used for the castings.

4.2.2 Chemical Analysis Specimens: When required by purchaser, shall be of size and shape agreed upon by purchaser and vendor.

4.3 Heat Treatment: All castings and tensile test specimens representing them shall be heat treated as follows:

4.3.1 Tensile test specimens from each lot, together with production castings, shall be heated to 440 F ± 15, held at heat for 7-9 hr, and cooled in air. At least one set of tensile test specimens shall be put into a batch-type furnace with each load of castings or into a continuous furnace at intervals of not longer than 3 hours.

4.4 Tensile Properties:

4.4.1 Tensile Test Specimens:

Tensile Strength, psi	25,000 min

4.4.2 Tensile Properties of Castings: When tensile properties of actual castings are determined for acceptance, not less than 4, and preferably 10, tensile test specimens shall be cut from thick and thin sections. The average value of all specimens selected shall conform to the following:

Tensile Strength, psi	18,800 min

4.4.2.1 Conformance to these requirements may be used as basis for acceptance of castings.

4.5 Hardness of Castings: Except at sprues and risers, the castings shall have hardness not lower than Brinell 65 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or not lower than Brinell 70 using 1000 kg load and 10 mm ball.

5. QUALITY:

5.1 Castings shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts. Castings shall have smooth surfaces and shall be well cleaned.

5.2 Radiographic and other quality standards shall be as agreed upon by purchaser and vendor.

5.3 Unless otherwise specified, castings shall be produced under radiographic control. This shall consist of radiographic examination of castings until proper foundry technique, which will produce castings free from harmful internal defects, is established for each mold, and of production castings as necessary to ensure maintenance of satisfactory quality.

5.4 Castings shall not be repaired by plugging, welding, or other methods, without written permission from purchaser.

5.5 Castings shall not be impregnated, chemically treated, or coated to prevent leaking, unless specified or allowed by written permission which states the method to be used. Impregnated castings shall be marked IMP.