

# AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.  
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AMS 4275B

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## ALUMINUM ALLOY CASTINGS, PERMANENT MOLD 6Sn - 1Cu - 1Ni (750-T5) Stress Relieved

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

2. APPLICATION: Primarily for bearings.

3. COMPOSITION:

|                         |           |
|-------------------------|-----------|
| Tin                     | 5.5 - 7.0 |
| Copper                  | 0.7 - 1.3 |
| Nickel                  | 0.7 - 1.3 |
| Iron                    | 0.7 max   |
| Silicon                 | 0.7 max   |
| Titanium                | 0.20 max  |
| Manganese               | 0.10 max  |
| Other Impurities, total | 0.30 max  |
| Aluminum                | remainder |

4. CONDITION: Stress relieved.

5. TECHNICAL REQUIREMENTS:

5.1 Casting:

5.1.1 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. When permitted by purchaser, molten metal may be taken from the alloying furnaces for pouring into castings without first casting into ingot and remelting provided that a sample for chemical analysis is taken after the last addition of metal to the furnace prior to removal of the alloy to the holding furnace or pouring ladle.

5.1.2 Castings shall be chilled at a sufficiently rapid rate to promote internal soundness but not so fast as to cause cracks.

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

5.2 Heat Treatment: All castings shall be stress relieved by heating uniformly to 420-440 F, holding at heat for not less than 5 hr, and cooling in air.

- 5.3 Hardness of Castings: Except at sprues and risers, the castings shall have hardness of Brinell 35-50 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or Brinell 40-55 using 1000 kg load and 10 mm ball.

6. QUALITY:

- 6.1 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.
- 6.2 Radiographic and other quality standards shall be as agreed upon by purchaser and vendor.
- 6.3 Unless otherwise specified, castings shall be produced under radiographic control. This shall consist of radiograph 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.
- 6.4 Castings shall not be repaired by plugging, welding, or other methods, without written permission from purchaser.
- 6.5 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.

7. REPORTS:

- 7.1 Unless otherwise specified, the vendor of castings shall furnish with each shipment three copies of a report of the results of tests to determine conformance of the castings to the requirements of this specification. This report shall show the chemical composition of the castings, lot number, material specification number, purchase order number, part number, and quantity. If the accuracy of control is adequate, each melt need not be analyzed, but the frequency of analysis shall be as agreed upon by purchaser and vendor.
- 7.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of castings, part number, and quantity. When castings for making parts are produced or purchased by the parts vendor, that vendor shall inspect each shipment or lot of castings to determine conformance to the requirements of this specification, and shall include in the report a statement that the castings conform, or shall include copies of laboratory reports showing the results of tests to determine conformance.

8. IDENTIFICATION: Unless otherwise specified, castings shall be identified in accordance with the latest issue of AMS 2804.

9. APPROVAL:

- 9.1 To assure uniformity of quality, sample castings from new or reworked molds shall be approved by purchaser, unless such approval be waived.