AERONAUTICAL MATERIAL SPECIFICATION

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

AMS4871B

Issued 3-1-42
Revised 6-1-51

ALUMINUM BRONZE CASTINGS, CENTRIFUGAL AND CHILL
85.3Cu - 10.9Al - 3.6Fe
Heat Treated

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 high strength and bearing retainers.

3. COMPOSITION:

Copper	83.5 min
Aluminum	10.3 - 11.5
Iron	3.0 - 4.25
Manganese	0.50 max
Nickel	0.50 max
Total Named Elements	99.7 min

4. CONDITION: Heat treated.

5. TECHNICAL REQUIREMENTS:

5.1 Casting: A melt shall be the metal withdrawn from a batch furnace charge of 2000 pounds or less as melted for pouring castings.

5.2 Tensile Test Coupons: Shall be cast with each melt of metal for castings and, when requested, shall be supplied with the castings. Coupons shall be of such size that a standard (0.5-inch diameter at the reduced parallel section) tensile test specimen may be machined from each coupon, and shall be cast in permanent molds. Metal for the coupons shall be part of the melt which is used for the castings. The temperature of the metal during pouring of the coupons shall be not lower than the temperature of the metal during pouring of the castings.

5.3 Heat Treatment: All castings and tensile test coupons shall be heat treated as follows:

5.3.1 Tensile test coupons, together with production castings, shall be quenched from a temperature not lower than 1600 F, reheated to not lower than 1100 F and cooled in air. At least one tensile test coupon 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.

5.4 Tensile Properties:

5.4.1 Tensile test specimens cut from the heat treated coupons shall conform to the following requirements:

Tensile Strength, psi	90,000 min
Yield Strength at 0.2% offset or at 0.0100 inch in 2 in. extension under load, psi	45,000 min
Elongation, % in 4D	5 min

5.4.2 If castings are cut for examination, tensile properties of specimens cut from sections of castings 1 in. and under in thickness shall conform to the requirements of 5.4.1; specimens cut from sections of castings over 1 in. in thickness shall conform to the following requirements:

Tensile Strength, psi	72,000 min
Yield Strength at 0.2% offset or at 0.0088 inch in 2 in. extension under load, psi	36,000 min
Elongation, % in 4D	5 min

5.5 Hardness: Castings shall have hardness of Brinell 200-235, using 3000 kg load, or equivalent hardness by other methods.

5.6 Fracture Test: When castings are broken for fracture test, the fracture shall have uniform color and be substantially free from oxides, blowholes, porosity and other defects. Castings shall be sufficiently ductile to show some bending before rupture.

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 Inspection standards and procedures shall be as agreed upon by purchaser and vendor.

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

7. REPORTS:

7.1 Unless otherwise specified, the vendor of castings shall furnish with each shipment three copies of a report showing the chemical composition of the castings, tensile properties of the tensile test specimens, melt numbers, purchase order number, material specification number, part number, and quantity.

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 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: Castings shall be identified in accordance with the latest issue of AMS 2804.