AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5355

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Revised

STEEL CASTINGS, PRECISION INVESTMENT, CORROSION RESISTANT
17Cr - 4Ni - 4Cu

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

2. APPLICATION: Primarily for small parts requiring good corrosion resistance and strength at temperatures up to 600 F.

3. COMPOSITION: Castings shall conform to the following:

Carbon	0.08 max
Manganese	1.0 max
Silicon	1.0 max
Phosphorus	0.04 max
Sulfur	0.04 max
Chromium	15.5 - 17.5
Nickel	3.0 - 5.0
Columbium + Tantalum	0.45 max
Copper	3.0 - 5.0

4. CASTING: Castings shall be poured either from remelted master heat metal or directly from a master heat. A master heat is refined metal of a single furnace charge. Gates, sprues, risers, and rejected castings shall be used only in preparation of master heats; they shall not be remelted directly, without refining, for pouring of castings. When permitted by purchaser, metal in the form of shot from more than one master heat may be uniformly blended together to form a master heat lot; the total weight of metal in a master heat lot shall not exceed 7000 pounds.

5. TEST SPECIMENS:

5.1 Tensile Test Specimens: Unless otherwise specified, tensile test specimens shall be cast to represent each master heat or master heat lot of metal in castings and, when requested, shall be supplied with the castings. The specimens shall be of standard proportions with 0.25 in. diameter at the reduced parallel section, shall be cast to size in molds made of the same refractory and heated to the same temperature as the molds for castings, and shall be cooled at approximately the same rate as the castings. Center gating may be used but, if specimens are so gated, the gate shall be completely removed before testing. If the metal for castings is given any treatment such as fluxing or cooling and reheating, metal for the specimens shall be so treated.

6. CONDITION: Solution heat treated, unless otherwise specified.

7. TECHNICAL REQUIREMENTS:

7.1 Heat Treatment: Castings and tensile test specimens shall be solution heat treated by heating to 1900 F ± 25, holding at heat for 1 hr per inch of section but in no case less than 30 min., and quenched in oil.

7.2 Hardness: Shall be not higher than Rockwell C 36 or equivalent.

7.3 Properties After Precipitation Heat Treatment: Tensile test specimens produced in accordance with 5.1 and solution heat treated as in 7.1 shall conform to the following requirements after being heated to 875 F ± 25, held at heat for 1 hr, and cooled in air. If supplied tensile test specimens fail to meet requirements or are not available, suitable specimens may be prepared from castings for test.

7.3.1 Tensile Properties:

Tensile Strength, psi	180,000 min
Yield Strength at 0.2% Offset or at 0.0072 in. in 1 in. Extension Under Load (E = 29,000,000), psi	150,000 min
Elongation, % in 4D	6 min
Reduction of Area, %	15 min

7.3.2 Hardness: Shall be not lower than Rockwell C 40 or equivalent.

8. QUALITY:

8.1 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. Unless otherwise specified, metallic shot or grit shall not be used for final cleaning.

8.2 When castings are broken for fracture test, the fracture shall have uniform color and be substantially free from oxides and other defects.

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

8.4 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 part number, and of production castings as necessary to ensure maintenance of satisfactory quality.

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

9. REPORTS:

9.1 Unless otherwise specified, the vendor of castings shall furnish with each shipment three copies of a report of the results of tests for chemical composition of at least one casting from each master heat or master heat lot represented and a statement that the castings conform to the requirements of this specification. This report shall include the purchase order number, master heat or master heat lot number (and code symbol if used), material specification number, part number, and quantity from each heat.