

# AERONAUTICAL MATERIAL SPECIFICATIONS

## AMS 5392F

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### ALLOY IRON CASTINGS, SAND, CORROSION RESISTANT 2.1Cr - 15Ni - 6.5Cu

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

2. APPLICATION: Parts requiring moderate corrosion and heat resistance at operating temperatures up to 800 F.

3. COMPOSITION:

Carbon	2.4 - 2.8
Manganese	1.0 - 1.5
Silicon	1.5 - 2.5
Phosphorus	0.30 max
Sulfur	0.12 max
Chromium	1.8 - 2.4
Nickel	14.0 - 16.0
Copper	6.0 - 7.0
Lead	0.003 max

3.1 If castings have sections less than  $\frac{3}{4}$  in. thick, carbon and silicon may each be as high as 3.0.

4. CONDITION: As cast, unless otherwise specified on the drawing.

5. TECHNICAL REQUIREMENTS:

5.1 Casting: A melt shall be the metal poured from a single ladle of 5000 lb or less.

5.2 Test Specimens:

5.2.1 Tensile Test Coupons: Shall be standard keel blocks as shown in Figure 1, unless purchaser permits use of "Y" blocks as shown in Figure 2. Coupons shall be cast with each melt of metal for castings and, when requested, shall be supplied with the castings. Coupons shall be cast in open molds made of suitable core sand, shall be poured directly after pouring the castings, and shall be left in the mold until black. Metal for the coupons shall be part of the melt which is used for the castings. Molding practice, and the coupon size when use of "Y" blocks is permitted, shall, insofar as practicable, be such that cooling rates of castings and coupons are substantially the same.

5.2.2 Chemical Analysis Specimens: For carbon determinations performed on the melt, a chilled pencil type specimen is preferred, but other type samples of proven accuracy are acceptable. For carbon determinations performed on castings, a solid sample cut from the casting shall be used.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. They are not to be used as a basis for legal action. The user of any technical report is entirely voluntary. There is no obligation to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against infringement of patents."

### 5.3 Tensile Properties:

- 5.3.1 Tensile Test Specimens: Standard tensile specimens (0.357 in. diameter at the reduced parallel section from 1/2 in. "Y" block, 0.505 in. diameter at the reduced parallel section from other tensile test coupons) cut from the coupons as shown in Figures 1 and 3 shall conform to the following requirements:

Tensile Strength, psi                      30,000 min

- 5.3.2 Castings: When tensile properties of actual castings are determined, tensile properties of specimens cut from sections of castings shall conform to the following requirements:

Tensile Strength, psi                      30,000 min

- 5.4 Hardness: Castings and test coupons shall have hardness of Brinell 140 - 180 using 3000 kg load, or Rockwell B 75 - 88.

- 5.5 Microstructure: Austenite matrix with uniformly distributed graphite flakes. Parts shall be capable of being cooled to -75 F without the austenite transforming to martensite; parts so cooled shall, after returning to room temperature, be sufficiently nonmagnetic to prevent a small steel magnet from adhering to the casting.

### 6. QUALITY:

- 6.1 Castings shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections 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.
- 6.2 When castings are broken for fracture test, the fracture shall have uniform color and be substantially free from oxides and other imperfections.
- 6.3 Radiographic and other quality standards shall be as agreed upon by purchaser and vendor.
- 6.4 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 imperfections, is established for each part number, and of production castings as necessary to ensure maintenance of satisfactory quality.
- 6.5 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 of the results of tests for chemical composition of each melt and for tensile properties of the test coupons representing each melt. This report shall include the purchase order number, melt number, material specification number, part number, and quantity from each melt.