

# AERONAUTICAL MATERIAL SPECIFICATION

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## IRON CASTINGS, PEARLITIC MALLEABLE

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **CONDITION:** Heat treated.
3. **TENSILE TEST SPECIMENS:** Not less than two tensile test specimens shall be cast with each melt of metal for castings and, when requested, shall be supplied with the castings. In the case of continuous melting, at least three tensile test specimens shall be cast for each 8-hour period of casting; one each cast, respectively, during pouring of the first castings, approximately the middle castings, and the last castings poured during the 8-hour period. Tensile test specimens shall be of standard size as described in ASTM A220-47T and shall be cast to size in molds made with the regular foundry mix of green sand without using chills.
4. **TECHNICAL REQUIREMENTS:**
  - 4.1 **Tensile Properties:**
    - 4.1.1 Tensile test specimens heat treated with the castings they represent shall conform to the following requirements:

Tensile Strength, psi	70,000 min
Yield Strength at 0.2% offset or at 0.010 inch in 2 in. extension under load, psi	50,000 min
Elongation, % in 4D	8 min
    - 4.1.2 If tensile test specimens are machined from castings, such specimens shall demonstrate tensile properties not lower than 75% of the requirements for separately cast tensile test specimens.
  - 4.2 **Hardness:** Castings shall have hardness of Brinell 170 - 223 or equivalent.
  - 4.3 **Structure:** Microstructure of castings shall consist of uniformly distributed temper carbon particles in the form of small rounded nodules in a matrix of lamellar or spheroidized pearlite, free from primary graphite and massive cementite.
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 When castings are broken for fracture test, the fracture shall have a uniform color and be substantially free from oxides and other defects.
  - 5.3 Inspection standards and procedures shall be as agreed upon by purchaser and vendor.

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