

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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Revised

STEEL CASTINGS, SAND, CORROSION AND HEAT RESISTANT 18Cr - 10.5Ni - Cb

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Parts and assemblies requiring both corrosion and heat resistance, and where such parts may require welding during fabrication. Parts and assemblies requiring oxidation resistance up to approximately 1500 F, but useful at the higher temperatures only when the stresses are very low.
3. **COMPOSITION:**

Carbon	0.10 max
Manganese	2.00 max
Silicon	1.50 max
Phosphorus	0.04 max
Sulfur	0.04 max
Chromium	17.00 - 20.00
Nickel	9.00 - 12.00
Columbium	10 x C - 1.25
Molybdenum	0.50 max
Copper	0.50 max

4. **CONDITION:** Annealed, unless otherwise specified.
5. **TECHNICAL REQUIREMENTS:** (a) **Annealing.**- Castings shall be annealed by heating to 2000 F + 50, holding at that temperature for not less than 30 min and cooling in air.

(b) **Hardness.**- Castings, after annealing, shall have hardness not higher than Brinell 170 or equivalent.

(c) **Embrittlement.**- Material in the annealed condition shall be capable of meeting the following test:

Embrittlement test specimens, after being heated to 1200 F for 2 hr and air cooled, shall withstand immersion for 48 hr in a boiling aqueous solution containing 100 g of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ and 100 ml of H_2SO_4 (sp gr 1.84) per liter of solution under a reflux condenser, without evidence of intercrystalline surface attack. After such immersion, the specimens shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the thickness of the specimen.

6. **QUALITY:** (a) 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.

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