AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 5344

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Revised

STEEL CASTINGS, INVESTMENT, CORROSION RESISTANT
16Cr - 4.0Ni - 3.1Cu
Solution and Precipitation Heat Treated, 180,000 psi
Premium Quality

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

2. APPLICATION: Primarily for parts requiring good corrosion resistance and strength at temperatures up to 600 F (315 C).

3. COMPOSITION: Castings shall conform to the following:

Carbon	0.06 max
Manganese	0.7 max
Silicon	0.5 - 1.0
Phosphorus	0.04 max
Sulfur	0.03 max
Chromium	15.5 - 16.7
Nickel	3.6 - 4.6
Columbium + Tantalum	0.15 - 0.40
Copper	2.8 - 3.5
Nitrogen	0.05 max

4. CONDITION: Homogenized and solution and precipitation heat treated.

5. TECHNICAL REQUIREMENTS:

5.1 Casting: Castings shall be poured either from remelted master heat metal or directly from a master heat. A master heat is previously refined metal of a single furnace charge. Gates, sprues, risers, and rejected castings shall not be remelted directly, without refining, for pouring of castings; they may be used in preparation of master heats. 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.

5.2 Test Specimens:

5.2.1 Cast Tensile Specimens: Unless otherwise specified, tensile test specimens shall be cast to represent each master heat or master heat lot of metal in castings, shall be heat treated with the 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.

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5.2.2 Specimens Cut from Castings: Tensile specimens machined from a casting shall conform to the requirements of 5.4. Specific locations of test specimens and specimen size shall be as agreed upon by purchaser and vendor.

5.3 Heat Treatment: Castings and tensile test specimens shall be heat treated as follows:

5.3.1 Homogenization Heat Treatment: Unless otherwise specified, heat to 2100 F ± 25 (1148.9 C ± 14), hold at heat for 90 min., and air cool as required to below 90 F (32 C).

5.3.2 Solution Heat Treatment: Heat to 1900 F ± 25 (1037.8 C ± 14), hold at heat for 30 min. per 1/2 in. of section thickness, and quench in oil to below 90 F (32 C).

5.3.3 Precipitation Heat Treatment: Heat to a temperature in the range of 900 - 925 F (482.2 to 496.1 C), hold at the selected temperature within ± 10 F (± 5.6 C) for 90 min., and air cool.

5.4 Tensile Properties:

	Cast Tensile Test Specimens	Specimens Cut from Castings
Tensile Strength, psi	180,000 min	180,000 min
Yield Strength at 0.2% Offset or at 0.0075 in. in 1 in. Extension Under Load (E = 29,000,000), psi	160,000 min	160,000 min
Elongation, % in 4D	6 min	4 min
Reduction in Area, %	15 min	12 min

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

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 defects.

6.3 Radiographic and other quality standards shall be 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.