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

AMS 5382C

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ALLOY CASTINGS, INVESTMENT, CORROSION AND HEAT RESISTANT
Cobalt Base - 25.5Cr - 10.5Ni - 7.5W

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

2. APPLICATION: Primarily for small parts, such as turbine blades and buckets, requiring high strength up to 1500 F (815 C) and oxidation resistance up to 2000 F (1095 C).

3. COMPOSITION: Castings shall conform to the following:

	min	max
Carbon	0.45	0.55
Manganese	--	1.0
Silicon	--	1.0
Phosphorus	--	0.4
Sulfur	--	0.04
Chromium	24.5	26.5
Nickel	9.5	11.5
Tungsten	7.0	8.0
Iron	--	2.0
Cobalt	remainder	

4. CONDITION: As cast, unless otherwise specified.

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 change. Gates, sprues, risers, and rejected castings shall only be used in preparation of a master heat; 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.

5.1.1 Temperature of Metal for Pouring: The temperature of the metal for pouring of castings shall be held within ± 50 F (± 28 C) of that agreed upon by purchaser and vendor.

5.1.2 Temperature of Molds: The temperature of the mold cavities at time of receiving metal from the furnace or ladle shall be held within ± 50 F (± 28 C) of that agreed upon by purchaser and vendor.

5.2 Test Specimens:

5.2.1 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. If the metal for castings is given any treatment such as fluxing or cooling and reheating, metal for the specimens shall be so treated and during such treatment shall be heated to the same maximum temperature and held for approximately the same length of time as the molten metal for castings. The temperature of the metal during pouring of the specimens shall be not lower than the temperature of the metal during pouring of the castings.

5.2.2 Bend Test Specimens: When arc melting is used for producing castings, three specimens at least 0.090 in. in diameter or thickness and approximately 2 in. in length shall be cast in each mold along with each cast part or parts.

5.3 Hardness:

5.3.1 Castings as cast shall have hardness not higher than Rockwell C 34.

5.3.2 Castings and specimens heated at 1475 F ± 10 (801.1 C ± 5.6) for 50 hr and cooled to room temperature shall have hardness not higher than Rockwell C 42.

5.4 Stress-Rupture Test at 1500 F (815.6 C): Material shall be capable of meeting the following requirements:

5.4.1 A tensile test specimen, maintained at 1500 F ± 5 (815.6 C ± 2.8) while an axial load of 30,000 psi is applied continuously, shall not rupture in less than 15 hours. The test shall be continued, after the 15 hr, until the specimen ruptures, either maintaining the same load or increasing the load to not over 35,000 psi as necessary to produce rupture. In either case, the elongation after rupture, measured at room temperature, shall be not less than 6% in 4D.

5.5 Bending: At least two of the specimens cast in each mold in accordance with 5.2.2 shall withstand, without cracking, bending at room temperature through an angle of 20 deg around a 0.5 in. diameter. If more than one specimen from a mold fails to pass this test, the disposition of the castings from that mold may be determined by applying a similar test to an actual casting or to specimens cut from castings, gates, or runners, or by determining that the carbon content of the metal in the mold conforms to the requirements of Section 3. Bend specimens shall be not less than 0.090 in. in diameter or thickness. Failure of any such additional specimens will be cause for rejection of the castings. Unless otherwise specified, bend test shall be performed by producer of castings.

5.6 Grain Size: Shall be essentially equiaxed with no abrupt change from coarse to fine grains.