AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5642

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STEEL, CORROSION AND HEAT RESISTANT
18Cr - 11Ni - Cb
(Free Machining)

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

2. FORM: Rods, bars, billets, and forgings.

3. APPLICATION: Primarily for parts which will be subjected to high temperatures during fabrication or in service, except that it is not intended for parts to be fusion welded.

4. COMPOSITION:

		Check Analysis	
		Under Min or	Over Max
Carbon	0.08 max	--	0.01
Manganese	2.00 max	--	0.04
Silicon	1.00 max	--	0.05
Phosphorus	0.11 - 0.17	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	17.00 - 19.00	0.20	0.20
Nickel	9.00 - 12.00	0.15	0.15
Columbium	10xC - 1.00	0.05	0.05
Selenium	0.15 - 0.35	0.03	0.03
Molybdenum	0.50 max	--	0.03
Copper	0.50 max	--	0.03

5. CONDITION: (a) Unless otherwise ordered, the product shall be solution heat treated and free from continuous carbide network.

(b) Unless otherwise ordered, rods and bars up to and including 1.5 in. in diameter or distance between parallel sides shall be supplied cold-finished with surface hardness of Brinell 170-255 or equivalent.

(c) Bars over 1.5 in. in diameter or distance between parallel sides and forgings shall have hardness of Brinell 140-241 or equivalent. Hexagons shall be supplied cold-finished.

(d) Stock ordered for forging shall be supplied as ordered by the forging manufacturer.

(e) Forgings shall not be supplied except when specified on the drawing or purchase order.

6. EMBRITTLEMENT: Unless otherwise specified the product shall be capable of meeting the following test:

Embrittlement test specimens, after being heated to 1200F for 2 hours and air cooled, shall withstand immersion for 48 hours in a boiling aqueous solution containing 100g of $CuSO_4.5H_2O$ and 100ml 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.