

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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New York City

AMS 5770

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Revised

ALLOY, CORROSION AND HEAT RESISTANT

Iron Base - 20Cr - 20Ni - 20Co - 4W - 4Mo - 4Cb

Solution and Precipitation Treated

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **FORM:** Bars, billets, and forgings.
3. **APPLICATION:** Parts and assemblies, such as turbine rotors, shafts, buckets, and bolts, requiring high strength up to 1500 F and oxidation resistance up to 1800 F.
4. **COMPOSITION:**

Carbon	0.38 - 0.48
Manganese	2.00 max
Silicon	1.00 max
Phosphorus	0.030 max
Sulfur	0.030 max
Chromium	19.00 - 22.00
Nickel	18.50 - 21.50
Cobalt	18.50 - 21.50
Molybdenum	3.50 - 4.50
Tungsten	3.50 - 4.50
Columbium	3.50 - 4.50
Copper	0.50 max
Iron	remainder

5. **CONDITION:** Unless otherwise specified, the product shall be furnished in the following condition:

- 5.1 **Bars:** Cold finished, solution and precipitation heat treated
- 5.2 **Forgings:** Solution and precipitation heat treated.
- 5.3 **Forging Stock:** As ordered by the forging manufacturer.

6. **TECHNICAL REQUIREMENTS:**

- 6.1 **Heat Treatment:** Material shall be solution heat treated by heating to 2200 F + 20, holding at that temperature for not less than one hour, and quenching in water. Material shall then be precipitation heat treated by heating to 1400 F + 10, holding at that temperature for not less than 10 hours, and air cooling.
- 6.2 **Hardness:** Bars and forgings shall have hardness of Brinell 248 - 331 or equivalent.
- 6.3 **Stress-Rupture Test at 1350 F:** Bars and forgings shall be capable of meeting the following requirements:

A tensile test specimen, maintained at 1350 F + 10 while an axial load of 30,000 psi is applied continuously, shall not rupture in less than 100 hours. The test shall be continued, after the 100 hours, until the specimen ruptures, either maintaining the same load or increasing the load to not over 40,000 psi as necessary to produce rupture. In either case, the elongation after rupture, measured at room temperature, shall be not less than 8% in 4D.