AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5727 A

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STEEL, CORROSION AND HEAT RESISTANT
16Cr - 25Ni - 6Mo

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

2. FORM: Forgings and forging stock.

3. APPLICATION: Primarily for parts, such as turbine wheels and discs, for use ø up to 1350 F.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.12 max	--	0.01
Manganese	2.00 max	--	0.04
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	15.00 - 17.50	0.20	0.20
ø Nickel	24.00 - 27.00	0.20	0.20
Molybdenum	5.50 - 7.00	0.10	0.10
Nitrogen	0.10 - 0.20	0.03	0.03
Copper	0.50 max	--	0.03

5. CONDITION:

5.1 Forging Stock: As ordered by the forging manufacturer.

5.2 Forgings: Unless otherwise specified, forgings shall be hot forged, hot-cold worked and stress relieved as follows:

5.2.1 Hot forging of blooms, billets, or shapes into required shape for subsequent hot-cold working shall be done by pressing or hammering. The temperature to which stock for pressing or hammering shall be heated shall not exceed 2000 F and stock shall be thoroughly and uniformly heated throughout the sections before any working is done. The temperature at which hot working shall cease shall be not lower than 1780 F.

5.2.2 When a forging has been finished to desired hot shape, it shall be cooled in still air to room temperature and inspected for surface imperfections. Imperfections of such a nature as small cracks or seams, which would not affect the final hot-cold working operation or use of the forging for service requirements, may be removed by grinding or other suitable means.

5.2.3 The forging shall be hot-cold worked as follows: It shall, in a period of 4-6 hr, be heated uniformly throughout to a temperature not higher than 1260 F and then worked to finished size in suitable dies, either by pressing or by hammering.

5.2.4 Forgings shall be stress relieved by heating to 1200-1220 F, holding at heat for not less than 4 hr per inch of maximum cross section, followed by air cooling, unless otherwise agreed upon by purchaser and vendor.

6. TECHNICAL REQUIREMENTS:

6.1 Tensile Properties: Unless otherwise specified, specimens cut from forgings with the axis approximately parallel to the forging flow lines shall conform to the following requirements:

Tensile Strength, psi	100,000 min
Yield Strength at 0.2% Offset or at 0.0096 in. in 2 in. Extension Under Load (E=28,500,000), psi	80,000 min
Elongation, % in 4D	10 min
Reduction of Area, %	15 min

6.2 Hardness: Forgings shall have hardness of Brinell 241-293 or equivalent.

6.3 Stress to Rupture Test at 1200 F: Specimens cut from forgings with the axis approximately parallel to the forging flow lines shall be capable of meeting the following requirements:

6.3.1 A tensile test specimen, maintained at 1200 F + 3 while an axial load of 45,000 psi is applied continuously, shall not rupture in less than 100 hours. The test shall be continued, after the 100 hr, until the specimen ruptures, either maintaining the same load or increasing the load to not over 48,000 psi as necessary to produce rupture. In either case, the elongation after rupture, measured at room temperature, shall be not less than 15% in 4D.

7. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment. This report shall include the purchase order number, part number or size, heat number, serial number of each forging when required, ingot number and position of forging stock in ingot when such information is available, material specification number, and quantity from each heat.