AERONAUTICAL MATERIAL SPECIFICATIONS

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

AMS 5768D

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ALLOY, CORROSION AND HEAT RESISTANT
Iron Base - 20Cr - 20Ni - 20Co - 3Mo - 2W - 1(Cb + Ta)
Solution and Precipitation Head Treated

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

2. FORM: Bars, forgings, flash welded rings, and stock for forgings or flash welded rings.

3. APPLICATION: Primarily for parts and assemblies, such as turbine rotors, shafts, buckets, and bolts, requiring high strength up to 1350 F and oxidation resistance up to 1800 F.

4. COMPOSITION:

Carbon	0.08 - 0.16
Manganese	1.00 - 2.00
Silicon	1.00 max
Phosphorus	0.040 max
Sulfur	0.030 max
Chromium	20.00 - 22.50
Nickel	19.00 - 21.00
Cobalt	18.50 - 21.00
Molybdenum	2.50 - 3.50
Tungsten	2.00 - 3.00
Columbium + Tantalum	0.75 - 1.25
Nitrogen	0.10 - 0.20
Iron	remainder

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

5. CONDITION:

5.1 Bars, Forgings, and Flash Welded Rings: Unless otherwise specified, solution and precipitation heat treated, and descaled.

5.1.2 Flash welded rings shall not be supplied unless specified or permitted on purchaser's part drawing. When supplied, they shall be manufactured in accordance with the latest issue of AMS 7490, unless otherwise specified.

5.2 Stock for Forgings or Flash Welded Rings: As ordered by the forging or flash welded ring manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Bars, Forgings, and Flash Welded Rings:

6.1.1 Heat Treatment: The product shall be solution heat treated by heating to 2150 F ± 25, holding at heat for 1 hr, and quenching in water, and shall then be precipitation heat treated by heating to 1500 F ± 25, holding at heat for 4 hr, and air cooling.

6.1.2 Hardness:

6.1.2.1 Bars, Forgings, and Flash Welded Rings: Brinell 192 - 241 or equivalent.

6.1.3 Stress-Rupture Test at 1350 F: Specimens taken from bars and forgings, and from parent metal of flash welded rings, shall be capable of meeting the following requirements:

6.1.3.1 The tensile specimen, maintained at 1350 F ± 10 while an axial stress of 24,000 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 stress or increasing the stress 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 10% in 4D.

6.2 Stock for Forging and Flash Welding: When a sample of stock is forged to a test coupon and heat treated as in 6.1.1, specimens taken from the heat treated coupon shall conform to the requirements of 6.1.2 and 6.1.3. If specimens taken from the stock after heat treatment as in 6.1.1 conform to the requirements of 6.1.2 and 6.1.3, the tests shall be accepted as equivalent to tests of the forged coupon.

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

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest Ø issue of AMS 2261 as applicable and as specified below:

Ø 8.1 Diameter: Table VII.

Ø 8.2 Thickness: Table VIII.

Ø 8.3 Width: Table IX.

9. REPORTS:

9.1 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 and the results of tests on each Ø size from each heat to determine conformance to the tensile property and hardness requirements of this specification. This report shall include the purchase order number, heat number, material specification number, size, and quantity from each heat. If forgings are supplied, the part number and size of stock used to make the forgings shall also be included.