AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 5768B

Issued 5-1-48
Revised 11-1-54

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

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:

		Check Analysis Under Min or Over Max	
Carbon	0.08 - 0.16	0.01	0.01
Manganese	1.00 - 2.00	0.04	0.04
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	20.00 - 22.50	0.25	0.25
Nickel	19.00 - 21.00	0.20	0.20
Cobalt	18.50 - 21.00	0.20	0.20
Molybdenum	2.50 - 3.50	0.10	0.10
Tungsten	2.00 - 3.00	0.10	0.10
Columbium + Tantalum	0.75 - 1.25	0.05	0.05
Nitrogen	0.10 - 0.20	0.01	0.01
Iron	remainder		

5. CONDITION:

5.1 Bars and Forgings: Unless otherwise specified, solution and precipitation heat treated after the final rolling or forging operations, and descaled. ø

5.2 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Heat Treatment: Bars and forgings shall be solution heat treated by heating to 2150 F ± 25, holding at heat for 1 hr, followed by quenching in water, and, unless otherwise specified, shall then be precipitation heat treated by heating to 1500 F ± 25, holding at heat for 4 hr, followed by air cooling. ø

6.2 Hardness:

6.2.1 Solution Heat Treated Bars and Forgings: Shall have hardness of Brinell 159-197 or equivalent.

6.2.2 Solution and Precipitation Heat Treated Bars and Forgings: Shall have hardness of Brinell 192-241 or equivalent.

6.3 Stress-Rupture Test at 1350 F: Specimens taken from bars and forgings shall be capable of meeting the following requirements:

6.3.1 A tensile test specimen, maintained at 1350 F ± 10 while an axial load 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 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 10% 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. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2241 as applicable and as specified below:

8.1 All hexagons, and other bars 1.5 in. and under in diameter or distance between parallel sides, Table I.

8.2 Bars, other than hexagons, over 1.5 in. in diameter or distance between parallel sides, Table II.

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. 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.

9.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.