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

AMS 5753

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Revised

ALLOY, CORROSION AND HEAT RESISTANT
Nickel Base - 18Cr - 17Co - 4Mo - 3Ti - 3Al
Vacuum Melted - Solution Heat Treated

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

2. FORM: Bars, forgings, and forging stock.

3. APPLICATION: Primarily for parts such as turbine blades, bolts, and fittings requiring high strength to 1600 F and oxidation resistance to 1800 F.

4. COMPOSITION:

Carbon	0.15	max
Manganese	0.75	max
Silicon	0.75	max
Sulfur	0.015	max
Chromium	15.0	- 20.0
Cobalt	13.0	- 20.0
Molybdenum	3.0	- 5.0
Titanium	2.50	- 3.25
Aluminum	2.50	- 3.25
Boron	0.003	- 0.010
Iron	4.0	max
Copper	0.15	max
Nickel	remainder	

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2269.

5. CONDITION:

5.1 Bars: Solution heat treated. Bars 2.75 in. and less in diameter or distance between parallel sides shall be cold finished, unless otherwise specified.

5.2 Forgings: Solution heat treated and descaled, unless otherwise specified.

5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Bars and Forgings:

6.1.1 Heat Treatment: The product shall be solution heat treated by heating to 1975 F ± 25, holding at heat for 4 hr, and air cooling.

6.1.2 Hardness: Shall be not higher than Rockwell C 34 or equivalent.

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6.1.3 Properties After Stabilization and Precipitation Heat Treatment: Material shall conform to the following requirements after being heated to 1550 F ± 25, held at heat for 24 hr, air cooled, reheated to 1400 F ± 25, held at heat for 16 hr, and air cooled. When permitted by purchaser, the 1550 F heat treatment may be omitted.

6.1.3.1 Tensile Properties at 1200 F: Tensile test specimens cut from the product, and heated to 1200 F ± 10, held at heat for 30 min., and tested at 1200 F ± 10, at a rate of approximately 0.005 in. per in. per min. to the 0.2% yield strength, shall conform to the following requirements.

Tensile Strength, psi	170,000 min
Yield Strength at 0.2% Offset or at 0.0126 in. in 2 in. Extension Under Load (E = 25,700,000), psi	110,000 min
Elongation, % in 4D	6 min
Reduction of Area, %	10 min

6.1.3.2 Hardness: Shall be not lower than Rockwell C 30 or equivalent.

6.1.3.3 Stress Rupture Test at 1650 F: Specimens taken from bars and forgings shall be capable of meeting the following requirements.

6.1.3.3.1 A tensile test specimen, maintained at 1650 F ± 5, while an axial load of 25,000 psi is applied continuously, shall not rupture in less than 24 hours. The test shall be continued, after the 24 hr, until the specimen ruptures, either maintaining the same load or increasing the load to not over 30,000 psi as necessary to produce rupture. In either case, the elongation after rupture, measured at room temperature, shall be not less than 5% in 4D.

6.1.3.4 Grain Size: Unless otherwise specified, shall be predominantly 2 or finer with occasional grains as large as 1 permissible, as determined by comparison of a polished and etched specimen with the chart in ASTM E112-58T.

6.2 Forging Stock: When a sample of stock is forged to a test coupon and heat treated as in 6.1.1 and 6.1.3, specimens taken from the heat treated coupon shall conform to the requirements of 6.1.3.1, 6.1.3.2 and 6.1.3.3. If specimens taken from the stock after heat treatment as in 6.1.1 and 6.1.3 conform to the requirements of 6.1.3.1, 6.1.3.2 and 6.1.3.3, the tests shall be accepted as equivalent to tests of the forged coupon.

7. QUALITY: Material shall be produced by vacuum induction melting or by double vacuum melting. It 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 issue of AMS 2261 as applicable.