Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10000

AEROSPACE MATERIAL SPECIFICATION

AMS 5754F
Superseding AMS 5754E
Issued 5-1-54
Revised 11-1-68

ALLOY BARS, FORGINGS, AND RINGS, CORROSION AND HEAT RESISTANT
Nickel Base - 22Cr - 1.5Co - 9.0Mo - 0.60W - 18.5Fe

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 forging or flash welded rings.

3. APPLICATION: Primarily for parts and assemblies, such as turbine rotors, shafts, flanges, buckets, and bolts, requiring oxidation resistance up to 2200 F (1204 C) and relatively high strength above 1500 F (816 C).

4. COMPOSITION:

	min	max
Carbon	0.05	0.15
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Ø Chromium	20.50	23.00
Cobalt	0.50	2.50
Molybdenum	8.00	10.00
Tungsten	0.20	1.00
Iron	17.00	20.00
Boron	--	0.010
Nickel	remainder	

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

5. CONDITION:

5.1 Bars, Forgings, and Flash Welded Rings: Solution heat treated.

5.1.1 Bars less than 0.75 in. in diameter or distance between parallel sides shall be descaled.

5.1.2 Round bars 0.75 in. and over in diameter shall be ground.

5.1.3 Bars other than round 0.75 in. and over in distance between parallel sides shall be descaled, unless otherwise specified.

5.1.4 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 Forging 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 (1176.7 C ± 14), holding at heat for not less than 20 min., and either quenching in water or rapid air cooling.

6.1.2 Hardness:

6.1.2.1 Bars: Shall have hardness not higher than Brinell 241 or equivalent when taken approximately midway between surface and center.

6.1.2.2 Forgings and Flash Welded Rings: Shall have hardness not higher than Brinell 241 or equivalent.

6.1.3 Stress-Rupture Test at 1500 F (815.6 C): Specimens taken from bars and forgings and from parent metal of flash welded rings shall be capable of meeting the following requirements:

Ø 6.1.3.1 A tensile test specimen, maintained at 1500 F ± 5 (815.6 C ± 2.8) while an axial stress of 15,000 psi is applied continuously, shall not rupture in less than 24 hours. The test shall be continued to rupture without change of stress. Elongation after rupture, measured at room temperature shall be not less than 10% in 4D. Tests shall be conducted in accordance with the issue of ASTM E139 specified in the latest issue of AMS 2350.

Ø 6.1.3.1.1 The test of 6.1.3.1 may be conducted at a stress higher than 15,000 psi but stress shall not be changed while test is in process. Time to rupture and elongation requirements shall be as specified in 6.1.3.1.

Ø 6.1.3.1.2 When permitted by purchaser, the test of 6.1.3.1 may be conducted using incremental loading. In such case, a stress of 15,000 psi shall be used to rupture or for 48 hr, whichever occurs first. After the 48 hr and at intervals of 8 - 16 hr, preferably 8 - 10 hr, thereafter, the stress shall be increased in increments of 5000 psi. Time to rupture and elongation requirements shall be as specified in 6.1.3.1.

6.2 Forging Stock: 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 test 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 agreed upon by purchaser and vendor, tolerances for bars shall conform to all applicable requirements of the latest issue of AMS 2261.

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 and its revision letter, 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 and its revision letter, 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.