AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5736

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Revised

STEEL, CORROSION AND HEAT RESISTANT
15Cr - 26Ni - 1.3Mo - 1.9Ti - 0.3V
Solution 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 rotors, shafts, buckets or blades, bolts, dowels, and fittings, requiring high strength up to 1300 F and oxidation resistance up to 1500 F.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.08 max	--	0.01
Manganese	1.00 - 2.00	0.04	0.04
Silicon	0.40 - 1.00	0.05	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	13.50 - 16.00	0.20	0.20
Nickel	24.00 - 27.00	0.20	0.20
Molybdenum	1.00 - 1.50	0.05	0.05
Titanium	1.75 - 2.25	0.05	0.05
Vanadium	0.10 - 0.50	0.03	0.03
Aluminum	0.35 max	--	0.05

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.

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

5.3 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 1800 F ± 25, holding at heat for 1 hr, followed by quenching in oil or water.

6.2 Hardness: Shall be Brinell 130-160 or equivalent.

6.3 Properties After Precipitation Heat Treatment: Material shall conform to the following requirements after heating to 1325 F ± 15, holding at heat for 16 hr, and air cooling.

6.3.1 Tensile Properties:

Tensile Strength, psi	130,000 min
Yield Strength at 0.2% Offset or at 0.0099 in. in 2 in. Extension Under Load (E = 29,000,000), psi	85,000 min
Elongation, % in 4D	15 min
Reduction of Area, %	18 min

6.3.1.1 When tensile test specimens are machined from approximately the center of large disc forgings, the elongation may be as low as 10% and the reduction of area as low as 12%.

6.3.2 Hardness: Shall be Brinell 248-321 or equivalent.

6.3.3 Stress-Rupture Test at 1200 F: Specimens shall be capable of meeting both of the following requirements; however, only the test outlined in 6.3.3.1 shall be performed unless otherwise agreed upon by purchaser and vendor:

6.3.3.1 A tensile test specimen with 60 deg Vee notch, with area at root of Vee approximately equal to half the area of the full section of specimen and ratio of radius of curvature at base of notch to full specimen diameter approximately equal to 0.02, maintained at 1200 F ± 3 while an axial load of 65,000 psi is applied continuously, shall not rupture in less than 23 hours.

6.3.3.2 A tensile test specimen, maintained at 1200 F ± 3 while an axial load of 65,000 psi is applied continuously, shall not rupture in less than 23 hours. The test shall be continued, after the 23 hr, until rupture occurs. The elongation after rupture, measured at room temperature, shall be not less than 5% 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 to cold finished.

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.