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

AMS 5655

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Revised

STEEL, CORROSION AND MODERATE HEAT RESISTANT
12.5Cr - 0.75Ni - 1Mo - 1W

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 and assemblies, such as compressor wheels and blades, requiring oxidation resistance up to 1000 F. Strength at the higher temperatures is superior to that of the standard 12Cr type.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.20 - 0.25	0.02	0.02
Manganese	1.00 max	---	0.03
Silicon	0.20 - 0.60	0.05	0.05
Phosphorus	0.040 max	---	0.005
Sulfur	0.030 max	---	0.005
Chromium	11.50 - 13.50	0.15	0.15
Nickel	0.50 - 1.00	0.03	0.03
Molybdenum	0.75 - 1.25	0.05	0.05
Tungsten	0.75 - 1.25	0.05	0.05
Vanadium	0.17 - 0.27	0.03	0.03

5. CONDITION:

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

5.2 Forgings: Hardened, tempered, 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 hardened by heating to 1925 F ± 25, holding at heat for 1 hr, and suitably quenching, and then tempered by heating to a temperature not lower than 1100 F, holding at heat for not less than 4 hr, air cooling, heating to not lower than 1000 F, holding at heat for not less than 4 hr, and air cooling.

6.1.2 Tensile Properties: Tensile test specimens cut from the product and tested at room temperature shall conform to the following requirements:

6.1.2 (Cont'd)

Tensile Strength, psi	140,000 min
Yield Strength at 0.2% Offset, psi	115,000 min
Elongation, % in 4D	13 min
Reduction of Area, %	25 min

6.1.3 Hardness: Shall be Brinell 293 - 341 or equivalent.

6.1.4 Impact Strength: Unless otherwise specified, the Izod impact value shall be not less than 8 ft-lb when tested at room temperature in accordance with ASTM A 370-54T using a V-notched specimen.

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, 6.1.3, and 6.1.4. If specimens taken from the stock after heat treatment as in 6.1.1 conform to the requirements of 6.1.2, 6.1.3, and 6.1.4, 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 issue of AMS 2241 as applicable and as specified below:

8.1 All hexagons, and other bars 2.75 in. and under in diameter or distance between parallel sides, Table I.

8.2 Bars, other than hexagons, over 2.75 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 and the results of tests on each size from each heat to determine conformance to the technical 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.

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.