AEROSPACE
MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York, N.Y. 10017

AMS 5658B
Superseding AMS 5658A
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STEEL BARS, FORGINGS, AND RINGS, CORROSION RESISTANT
15Cr - 5Ni - 4Cu

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

2. FORM: Bars, wire, forgings, flash welded rings, and stock for forgings or flash welded rings.

3. APPLICATION: Primarily for parts requiring corrosion resistance and high strength at temperatures up to 600 F (316 C) that require hot upsetting or flattening operations.

4. COMPOSITION:

	min	max
Carbon	--	0.07
Manganese	--	1.00
Ø Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	14.00	15.50
Nickel	3.50	5.50
Columbium + Tantalum	5xC	0.45
Copper	2.50	4.50

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

5. CONDITION:

5.1 Bars, Wire, Forgings, and Flash Welded Rings: Solution heat treated as in 6.1.1, unless otherwise specified.

5.1.1 Rounds: Centerless ground or centerless ground and polished, after solution heat treatment. Unless otherwise specified, centerless ground shall be supplied.

5.1.2 Hexagons: Cold drawn, solution heat treated, and descaled.

5.1.3 Squares and Flats: Hot finished, solution heat treated, and descaled.

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 Forgings or Flash Welded Rings: As ordered by the forging or flash welded ring manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Bars, Wire, Forgings, and Flash Welded Rings:

6.1.1 Heat Treatment: The product shall be solution heat treated by heating to 1900 F ± 25 (1037.8 C ± 14) and cooling as required.

Printed in U.S.A.

6.1.2 Hardness:

6.1.2.1 Bars and Wire: Shall have hardness not higher than Brinell 363 or equivalent when taken midway between surface and center.

6.1.2.2 Forgings and Flash Welded Rings: Shall have hardness not higher than Brinell 363 or equivalent.

6.1.3 Properties After Precipitation Heat Treatment: Specimens taken in the longitudinal direction from bars and wire, from forgings with specimen axis approximately parallel to the forging flow lines, and in the circumferential direction from parent metal of flash welded rings shall conform to the following requirements after being heated to 900 F ± 10 (482.2 C ± 5.6), held at heat for 1 hr, and air cooled; these requirements apply only to material 8 in. and less in cross section thickness.

6.1.3.1 Tensile Properties:

Tensile Strength, psi	190,000 min
Yield Strength at 0.2% Offset or at 0.0159 in. in 2 in. Extension Under Load (E = 28,500,000), psi	170,000 min
Elongation, % in 2 in. or 4D	10 min
Reduction of Area, %	35 min

6.1.3.2 Hardness: Brinell 388 - 448 or equivalent.

6.1.4 Other Precipitation Heat Treatments: Properties after precipitation heat treatment at temperatures other than 900 F ± 10 (482.2 C ± 5.6) shall be as agreed upon by purchaser and vendor.

6.2 Stock for Forgings or Flash Welded Rings: 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 and 6.1.3.2. 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 and 6.1.3.2, the tests shall be accepted as equivalent to tests of the forged coupon.

7. QUALITY: The product 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 for bars and wire shall conform to all applicable requirements of the latest issue of AMS 2241. Tolerances for sizes not covered by AMS 2241 shall be as agreed upon by purchaser and vendor.

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 for tensile properties and hardness of each size from each heat. 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, precipitation heat treatment conditions if different from those of 6.1.3, 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.