Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS5629A
Superseding AMS 5629
Issued 11/1/68
Revised 5/1/70

STEEL BARS, FORGINGS, TUBING, AND RINGS, CORROSION RESISTANT
13Cr - 8Ni - 2.3Mo - 1.1Al
Vacuum Induction plus Consumable Electrode Melted

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, mechanical tubing, forgings, flash welded rings, and stock for forging or flash welded rings.

3. APPLICATION: Primarily for parts requiring corrosion resistance, stress corrosion resistance, and high strength at temperatures up to 600 F (316 C) and good ductility and strength in the transverse direction in large section sizes.

4. COMPOSITION:

	min	max
Carbon	--	0.05
Manganese	--	0.10
Silicon	--	0.10
Phosphorus	--	0.010
Sulfur	--	0.008
Chromium	12.25	13.25
Nickel	7.50	8.50
Molybdenum	2.00	2.50
Aluminum	0.90	1.35
Nitrogen	--	0.010

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248, except that no variation is permitted for nitrogen.

5. CONDITION: Unless otherwise ordered, the product shall be supplied in the following condition:

5.1 Bars, Wire, Forgings, Mechanical Tubing, and Flash Welded Rings: Solution heat treated as in 6.1.1.

5.1.1 Rounds: Centerless ground after solution heat treatment.

5.1.2 Hexagons: Cold drawn after solution heat treatment and descaling.

5.1.3 Squares and Flats: Hot finished before solution heat treatment.

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.

Printed in U.S.A.

6. TECHNICAL REQUIREMENTS:

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

6.1.1 Heat Treatment: The product shall be solution heat treated by heating to 1700 F ± 25 (926.7 C ± 14), holding at heat for a time commensurate with thickness, and cooling as required to below 60 F (16 C).

6.1.2 Properties As Solution Heat Treated:

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

ø 6.1.2.2 Wire: Shall have tensile strength not higher than 175,000 psi.

6.1.2.3 Tubing, 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 from the product in sizes up to 12 in., incl, in cross-section thickness shall conform to the following requirements after being heated to 950 F ± 10 (510 C ± 5.6) held at heat for 4 hr, and cooled in air:

6.1.3.1 Tensile Properties:

ø

Specimen Orientation	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 28,500,000)		Elongation % in 2 in. or 4D, min	Reduction of Area %, min
		psi min	Extension Under Load in. in 2 in.		
Longitudinal	220,000	205,000	0.0184	10	45
Transverse	220,000	205,000	0.0184	10	35

6.1.3.1.1 Longitudinal test requirements apply to specimens taken in the longitudinal direction from bars and wire, specimens taken from forgings with axis approximately parallel to the flow lines, and specimens taken in the circumferential direction from parent metal of flash welded rings; transverse test requirements apply to all products with cross-sections 3 in. or greater in thickness. Products tested in the transverse direction need not be tested in the longitudinal direction.

ø

6.1.3.2 Hardness: Not lower than Brinell 430 or equivalent.

6.1.4 Other Precipitation Heat Treatment: Properties after precipitation heat treatment at temperatures other than 950 F ± 10 (510 C ± 5.6) shall be as agreed upon by purchaser and vendor.

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 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.

6.3 Stock for Flash Welded Rings: A sample of stock heat treated as in 6.1.1 and 6.1.3 shall conform to the requirements of 6.1.3.1 and 6.1.3.2.

7. QUALITY: Material shall be multiple melted using vacuum induction followed by vacuum arc consumable electrode remelting. 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 all applicable requirements of the following: