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

AMS 5639A

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STEEL, CORROSION RESISTANT
19Cr - 9Ni (SAE 30304)

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

3. APPLICATION: Primarily for parts requiring corrosion resistance and heat resistance up to 800 F.

4. COMPOSITION:

		Check Analysis Under Min or Over Max	
Carbon	0.08 max	--	0.01
Manganese	2.00 max	--	0.04
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	18.00 - 20.00	0.20	0.20
Nickel	8.00 - 11.00	0.15	0.15
Molybdenum	0.50 max	--	0.03
Copper	0.50 max	--	0.03

5. CONDITION:

5.1 Bars, Forgings, Flash Welded Rings, and Mechanical Tubing: Solution heat treated free from continuous carbide network. Ø

5.1.1 Unless otherwise specified, all hexagons, and other bars 2.75 in. and under in diameter or distance between parallel sides shall be cold finished.

5.1.2 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 latest issue of AMS 7490, unless otherwise specified. Ø

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

6. TECHNICAL REQUIREMENTS:

6.1 Hardness:

6.1.1 Bars and Mechanical Tubing: Shall have hardness as follows or equivalent when taken approximately midway between outer surface and center or inner surface as applicable:

6.1.1.1 Bars:

Nominal Diameter or Distance Between Parallel Sides, Inches	Hardness, Brinell
0.75 and under	170 - 255
Over 0.75	140 - 241

6.1.1.2 Tubing: Not higher than Rockwell B 90.

6.1.2 Forgings and Flash Welded Rings: Shall have hardness not higher than Brinell 187 or equivalent.

6.2 Embrittlement: Material from bars, forgings, tubing, and flash welded rings shall be capable of meeting the following test:

6.2.1 Test specimens shall withstand immersion for 48 hr in a boiling aqueous solution containing 100 g of $CuSO_4 \cdot 5H_2O$ and 100 ml of H_2SO_4 (sp gr 1.84) per liter of solution under a reflux condenser, without evidence of intercrystalline surface attack. After such immersion, the specimens shall withstand, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to the thickness of the specimen.

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 following.

8.1 Bars: The latest issue of AMS 2241 as applicable and as specified below:

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

8.1.2 Bars, other than hexagons, over 2.75 in. in diameter or distance between parallel sides, Table II.

8.2 Tubing: The latest issue of AMS 2243 as applicable. Diameter tolerances shall conform to Table I, columns headed "Annealed or Solution Heat Treated".

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.