AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 5639

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Revised

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

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

2. FORM: Bars, forgings, forging stock, and mechanical tubing.

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

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis 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 and Mechanical Tubing: Solution heat treated free from continuous carbide network.

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 Hot worked forgings shall not be supplied except when specified on the drawing or purchase order.

5.2 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Hardness: Material shall have hardness as follows or equivalent when taken midway between center and surface:

6.1.1 Bars:

Nominal Diameter or Distance Between Parallel Sides Inches	Hardness, Brinell
0.75 and under	170-255
Over 0.75 to 1.50, incl	163-255
Over 1.50	140-241

6.1.2 Tubing: Rockwell B 75-90.

6.2 Embrittlement: Material 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 $CuSO_4.5H_2O$ 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 degrees 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 defects 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.