AEROSPACE MATERIAL SPECIFICATION

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

AMS 5644

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Revised

STEEL, CORROSION RESISTANT
17Cr - 7Ni - 1Al Precipitation Hardening

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 requiring corrosion resistance and high strength up to 600 F, and where such parts may require welding during fabrication.

4. COMPOSITION:

		Check Analysis Under Min or Over Max	
Carbon	0.09 max	--	0.01
Manganese	1.00 max	--	0.03
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	16.00 - 18.00	0.20	0.20
Nickel	6.50 - 7.75	0.10	0.10
Aluminum	0.75 - 1.50	0.10	0.10

5. CONDITION:

5.1 Bars: Annealed at 1900 F ± 25 and water quenched, having hardness as indicated below when tested midway between center and surface.

5.1.1 Rounds: Ground, turned, or polished, having hardness not higher than Brinell 229 or equivalent.

5.1.2 Hexagons: Cold drawn for size after annealing, having hardness not higher than Brinell 255 or equivalent.

5.1.3 Flats: Hot finished and descaled, having hardness not higher than Brinell 229 or equivalent.

5.2 Forgings: Unless otherwise specified, annealed at 1900 F ± 25 and water quenched, having hardness not higher than Brinell 229 or equivalent.

5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS: Material shall conform to the following requirements after transformation and precipitation heat treatment consisting of heating to 1400 F ± 25, holding at heat for 1½ hr, cooling to 60 F or below, reheating to 1050 F ± 10 and holding at heat for 1½ hr followed by air cooling.

6.1 Bars:

6.1.1 Tensile Properties:

Tensile Strength, psi	180,000 min
Yield Strength at 0.2% Offset or at 0.0143 in. in 2 in. Extension Under Load (E = 29,000,000), psi	150,000 min
Elongation, % in 4D	6 min
Reduction of Area, %	25 min

6.1.2 Hardness: Not lower than Brinell 375 or equivalent.

6.2 Forgings:

6.2.1 Hardness: Not lower than Brinell 375 or equivalent.

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 latest issue of AMS 2241 as applicable and as specified below:

8.1 Rounds: Table I.

8.2 Hexagons: Table I as applicable to non-heat treated bars.

8.3 Flats: 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