

Inconel® alloy 718

UNS N07718
W.Nr 2.4668

Inconel® 718 is an age-hardenable Nickel-Chromium-Columbium (Niobium)-Molybdenum alloy with high strength, corrosion-resistance, and good fabrication characteristics. Inconel® 718 has high tensile, yield, and creep-rupture properties at high temperatures and can operate at cryogenic temperatures up to 1200°F (650°C). Applications include springs, valves, and aircraft and land-based turbine engines. Industries supplied include: Oil & Gas Extraction, Nuclear, Aerospace, Defense and Automotive.

Nominal Composition

	Ni	Cr	Cb (Nb)	Mo	Ti	Fe	Co	Al	Mn	Si	Cu
min	50	17	4.75	2.8	0.65			0.2			
max	55	21	5.5	3.3	1.15	balance	1.0	0.8	0.35	0.35	0.3

Physical Properties

	At 70°F	At 20°C
Density	0.296 lb/in ³	8.19 g/cm ³
Modulus of Elasticity (E)	29 x 10 ³ ksi	200 GPa
Modulus of Rigidity (G)	11.6 x 10 ³ ksi	80 GPa
Coefficient of Expansion	7.7 microinches/in.-°F (70-600°F)	13.9 x μm/m-°C (20-300°C)
Electrical Resistivity	47.5 μ ohm.in	121 μ ohm.cm
Thermal Conductivity	79 Btu-in./ft. ² hr.-°F	11.4 W/m-K

Applicable Specifications

Wire & Bar	AMS 5662, AMS 5663, AMS 5664, AMS 5832, AMS 5962, ASME SB-637, ASTM B637, AWS A5.14, NACE MR0175 (ISO 15156-3).
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Typical Mechanical Properties – Spring Applications

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	1800°F (980°C)	115 – 145 ksi (790-1000 MPa)	-330°F to 1200°F (-200°C to 650°C)
Spring Temper		190-220 ksi (1310-1515 MPa)	-330°F to 1200°F (-200°C to 650°C)
Spring Temper + Aged	After spring coiling. Age: 1325°F (720°C) for 8 hours, furnace cool to 1150°F and hold for a total aging time of 18 hours.	220 ksi minimum (1515 MPa)	-330°F to 1200°F (-200°C to 650°C)

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