ALLOY 718

AMS 5596 / AMS 5662 / UNS N07718

Inconel® 718 is a high-performance, precipitation-hardening nickel-chromium alloy engineered for demanding applications that require exceptional strength, heat resistance, and corrosion resistance. Featuring significant levels of iron, columbium (niobium), and molybdenum—with additional aluminum and titanium for strengthening—Inconel 718 offers outstanding weldability, formability, and cryogenic toughness compared to other nickel-based superalloys.

This non-magnetic alloy maintains superior resistance to corrosion, oxidation, creep, and stress rupture at elevated temperatures. Inconel® 718 delivers reliable performance with high strength and excellent ductility up to 1300°F (704°C) and provides oxidation resistance up to 1800°F (982°C), making it a top choice for critical aerospace, energy, and high-temperature industrial applications.

Products & Sizes				
Coil	**Sheet**	**Plate**	**Bar**	**Precision Reroll Strip**
0.020" - 0.160"	0.020" - 0.160"	0.1875" - 2.000"	0.250" - 10.000"	0.0008" - 0.015"

718 Chemical Composition

	Element	Min	Max
C	Carbon	-	0.008
Mn	Manganese	-	0.35
P	Phosphorus	-	0.015
S	Sulfur	-	0.015
Si	Silicon	-	0.35
Cr	Chromium	17.00	21.00
Ni	Nickel	50.00	55.00
Mo	Molybdenum	2.80	3.30
Nb	Columbium	4.75	5.50
Ti	Titanium	0.65	1.15
Al	Aluminum	0.20	0.80
Co	Cobalt	-	1.00
B	Boron	-	0.006
Cu	Copper	-	0.30
Ta	Tantalum	-	0.05
Fe	Iron	-	Balance

Industry Standards

- PWA-LCS
- DFARS Compliant
- RR SABRe Edition 2
- GE Aircraft Engine (GT193)
- GE Aviation S-SPEC-35 AeDMS S-400
- EN 2.4668
- EN 10204

Industry Applications

- Jet Engine
- Gas Turbine Operations
- Base Plates
- Rotor Bolts (Power Generation)
- Burst Discs

Physical Properties

Property	Value
Electrical Resistivity	68°F (20°C)
Annealed	127 microhm-cm
Aged	121 microhm-cm

Density and Specific Gravity		
Property	**Annealed Condition**	**Aged Condition**
Density	0.296 lb./in3 (8.19 g/cm3)	0.297 lb./in3 (8.22 g/cm3)
Specific Gravity	8.19	8.22

Thermal Conductivity			
Temperature Range		**Coefficients**	
°C	**°F**	**W/m·K**	**Btu/(hr/ft²/in/°F)**
0-100	32-212	6.5	11.2

Mechanical Properties

Typical Short Time Tensile Properties as a Function of Temperature

- Solution Treatment: 1800°F (982°C) 1 hour
- Precipitation Treatment: 1325°F (718°C) 8 hours, Furnace Cool at 100°F (55°C) per hour to 1150°F (621°C) 8 hours

Inconel 718 machining often results in less tool life due to the work hardening and abrasion properties of the alloy. High cutting pressure and temperature also contributes towards work hardening, surface tearing, and deformation.

Mechanical Properties and Yield Strength of Alloy 718			
Product	**Yield Strength Max (0.2% offset)**	**Ultimate Tensile Strength Max**	**Elongation (% in 2")**
Sheet & Strip	80,000 psi (550 MPa)	14,000 (965 MPa)	30 (min)
Plate	105,000 psi (725 MPa)	150,000 (1,035 MPa)	30 (min)

Solution Treated plus Precipitation Heat Treatment		
Yield Strength Max (0.2% offset)	**Ultimate Tensile Strength Min**	**Elongation (% in 2")**
150,000 (1,035 MPa)	180,000 (1,240 MPa)	12 (min)