

Alloy 718 is an austenitic nickel-base superalloy which is used in applications requiring high strength to approximately 1400°F (760°C) and oxidation resistance to approximately 1800°F (982°C). In addition, the alloy exhibits excellent tensile and impact strength even at cryogenic temperatures. High strength at room and elevated temperatures is developed by a precipitation heat treatment at 1325°F (718°C) with cooling and a hold of 1150°F (621°C). The relatively slow response to precipitation hardening permits repair welding of the alloy even in the aged condition. [Click here to view the 718 Product Page on our website.](#)

Nominal Composition

C	Carbon – 0.08%
Mn	Manganese – 0.35%
P	Phosphorous – 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

Percent by weight, maximum unless a range is listed.

Standard Inventory Specifications

718 Plate, Sheet, Coil and Bar:
AMS: 5596, 5597, 5583, 5589, 5590, 5662, 5663, 5664, 5832
ASTM: B670, B637, B1014
ASME: SB-637, SFA-5.14
GE: B50TF14, B50TF15

Other industry standards:
UNS N07718
PWA-LCS
DFARS Compliant
RR SABRe Edition 2
GE-S400/1000
EN 2.4668
EN 10204

Features

- Excellent tensile and impact strength
- Permits repair welding of the Type 718 Alloy even in the aged condition
- Generally supplied in the solution treated condition



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Industry Applications

- Aircraft Turbines
- Gas Turbines
- Fasteners
- Spacers

Resistance to Corrosion: Type 718 alloy has good resistance to oxidation and corrosion at temperatures in the alloy's useful strength range in atmospheres encountered in jet engines and gas turbine operators.

Physical Properties

	Annealed Condition	Aged Condition
Density	0.296 lb./in ³ (8.19 g/cm ³)	0.297 lb./in ³ (8.22g/cm ³)
Specific Gravity	8.19	8.22

Thermal Conductivity

Temperature Range		Coefficients	
°C	°F	W/m·K	Btu/(hr/ft ² /in/°F)
0-100	32-212	6.5	11.2

Electrical Resistivity

Electrical Resistivity at 68°F (20°C)

- 127 microhm-cm
- Aged: 121 microhm-cm

Mechanical Properties

The room temperature strength of the Type 718 alloy is substantially increased by precipitation heat treatment as the following data indicate. These values are properties specified for sheet, strip and plate in AMS 5596 and AMS 5597.

Yield Strength Max (0.2% Offset)	Ultimate Tensile Strength Max	Elongation (% in 2")
Sheet and Strip	80,000 psi (550 MPa)	14,000 (965 MPa) 30 (min) Btu/(hr/ft ² /in/°F) 30 (min)
Plate	105,000 psi (725 MPa)	150,000 (1,035 MPa) 3 30 (min)

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

Typical Shot 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