



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

|           |                           |
|-----------|---------------------------|
| <b>C</b>  | Carbon – 0.08%            |
| <b>Mn</b> | Manganese – 0.35%         |
| <b>P</b>  | Phosphorous – 0.015%      |
| <b>S</b>  | Sulfur – 0.015%           |
| <b>Si</b> | Silicon – 0.35%           |
| <b>Cr</b> | Chromium – 17.00 – 21.00% |
| <b>Ni</b> | Nickel – 50.00 – 55.00%   |
| <b>Mo</b> | Molybdenum – 2.80 – 3.30% |
| <b>Nb</b> | Columbium 4.75 – 5.50%    |
| <b>Ti</b> | Titanium – 0.65 – 1.15%   |
| <b>Al</b> | Aluminum – 0.20 – 0.80%   |
| <b>Co</b> | Cobalt – 1.00%            |
| <b>B</b>  | Boron – 0.006%            |
| <b>Cu</b> | Copper – 0.30%            |
| <b>Ta</b> | Tantalum – 0.05%          |
| <b>Fe</b> | 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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our product page  
and request a quote  
on alloy 718**

## 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 <sup>3</sup> (8.19 g/cm <sup>3</sup> ) | 0.297 lb./in <sup>3</sup> (8.22g/cm <sup>3</sup> ) |
| Specific Gravity | 8.19  | 8.22   |

## Thermal Conductivity

| Temperature Range |        | Coefficients |                                 |
|-------------------|--------|--------------|---------------------------------|
| °C                | °F     | W/m·K        | Btu/(hr/ft <sup>2</sup> /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.

| Product         | Yield Strength<br>Max (0.2% Offset) | Ultimate Tensile<br>Strength Max | Elongation (% in 2") |
|-----------------|-------------------------------------|----------------------------------|----------------------|
| Sheet and 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 Min (0.2% Offset)                   | Ultimate Tensile Strength Min | Elongation (% in 2") |
| 150,000 (1,035 MPa)                                | 180,000 (1,240 MPa)           | 12 (min)             |

## 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