

# Material Specification

## Nickel Alloy In718

Building Success  
Layer by Layer™



**Application:** In718 is a nickel based heat resistant alloy. Its composition corresponds to UNS N07718, AMS 5662, AMS 5664, W.Nr 2.4668, DIN NiCr19Fe19NbMo3. This kind of precipitation-hardening nickel-chromium alloy is characterized by having good tensile, fatigue, creep and rupture strength at temperatures up to 700°C. In718 alloy also has outstanding corrosion resistance in various corrosive environments.



This material is ideal for many high temperature applications such as gas turbine parts, instrumentation parts, power and process industry parts etc. The material also possesses excellent cryogenic properties and potential for cryogenic applications.

- Typical applications:**
- Aero and land based turbine engine parts
  - Rocket and space application components
  - Chemical and process industry parts
  - Oil well, petroleum and natural gas industry parts

Physical and Chemical Properties:		
Relative Density with Standard Parameters		approx. 100% (min. 8.15 g/cm <sup>3</sup> )
Material composition	Ni 50-55 wt%	Ti 0.65-1.15 wt%
	Cr 17-21 wt%	Al 0.20-0.80 wt%
	Nb 4.75-5.5 wt%	Co ≤ 1.0 wt%
	Mo 2.8-3.3 wt%	Cu ≤ 0.3 wt%
		C ≤ 0.08 wt%
		Si, Mn each ≤ 0.35 wt%
		P, S each ≤ 0.015 wt%
		B ≤ 0.006 wt%
		Fe balance
Mechanical Properties:		
		After standard heat treatment cycle NI_In718_C
Tensile Strength	- horizontal direction (XY) - vertical direction (Z)	typ. 1400 MPa ± 100 MPa
Yield strength (Rp 0.2%)	- horizontal direction (XY) - vertical direction (Z)	typ. 1150 MPa ± 100 MPa
Elongation at break	- horizontal direction (XY) - vertical direction (Z)	typ. 15 ± 3%
Modulus of elasticity		typ. 170 GPa ± 20 GPa
Hardness		typ. 47 HRC
Thermal Properties:		
Coefficient of thermal expansion		over 25-200°C 12.5-13.0 x 10 <sup>-6</sup> m/m°C over 25-750°C 16.6-17.2 x 10 <sup>-6</sup> m/m°C
Maximum operating temperature for parts under load		approx. 650°C
Oxidation resistance up to (according to literature)		approx. 980°C

**For further technical information or to obtain a quotation for your parts, please contact us on +44 (0)1635 580284 or email your 3D CAD data to [enquiries@3trpd.co.uk](mailto:enquiries@3trpd.co.uk)**

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