

Wipro 3D – Inconel 718

Nickel Alloy - IN718, also known as Inconel 718 (complying to ASTM F3055), is a high-strength, corrosion-resistant nickel-chromium alloy widely used in demanding environments such as aerospace, power generation, and chemical processing. This document provides information and data for parts built using Inconel 718 powder on EOS M290 & M400 with Laser Powder Bed Fusion (LPBF) process.

Characteristics

Parts built from Inconel 718 have the chemical composition corresponding to UNS N07718

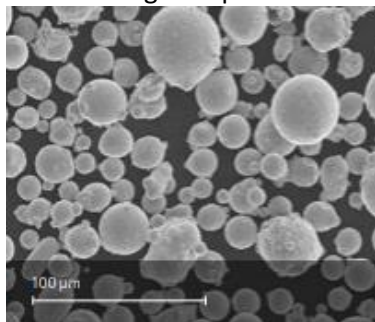
- High tensile, fatigue, creep, and rupture strength up to 700°C (1290°F)
- Excellent corrosion resistance
- Outstanding weldability, especially resistance to post-weld cracking
- Good machinability and can be precipitation hardened
- Thermal stability across a wide temperature range (-423°F to 1300°F)

Applications

- Aerospace: Turbine engines, rocket components, fasteners.
- Power generation: Gas turbines, nuclear reactors
- Chemical processing: Heat exchangers, valves
- Cryogenics: Tankage and structural components
- Automotive and marine: High-performance parts

Microstructures & Density

SEM Images of powder



As printed micro-density: 99.98%



Uniform as built microstructure



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Chemical Composition

Table 1: Chemical Composition of Inconel 718 (weight %)

Element	Minimum	Maximum
Carbon	-	0.08
Manganese	-	0.35
Silicon	-	0.35
Phosphorus	-	0.015
Sulphur	-	0.015
Chromium	17.0	21.0
Cobalt	-	1.0
Molybdenum	2.80	3.30
Niobium + tantalum	4.75	5.50
Titanium	0.65	1.15
Aluminum	0.20	0.8
Iron	Remainder	
Copper	-	0.3
Nickel	50.00	55.00
Boron	-	0.006
Lead	-	10ppm
Bismuth	-	0.5ppm

Mechanical Properties

Table 2: Mechanical properties of LPBF processed Inconel 718_40µm layer thickness.

Property	Minimum values
Ultimate Tensile Strength (MPa)	> 1300
Yield Strength (MPa)	>1250
Elongation (%)	>12
Hardness (BHN)	> 350
Density (g/cm ³)	≥ 8.15

Disclaimer: While every reasonable effort has been made to ensure that the information contained in this data sheet is correct, there is no guarantees or warranties (express or implied) concerning the accuracy or completeness of the information provided and expressly excludes all liabilities for any inaccuracies in this document or failure to achieve the stated levels.

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