



# Material Data Sheet Inconel 718 / NiCr19Fe19Nb5Mo3/



This document provides information and data for parts built using Inconel 718 powder, with specific properties (given in the table 'Physical and chemical properties of powder').

## Description :

Inconel 718 is a superalloy which shows good mechanical properties and resistance at high temperature. It is known for its good post weld behavior. Due to these properties, it is used in a large range of application in aircraft and aerospace industry. For any production of these applications it is required to get a validation according to the relevant standards.

## Technical data :

Physical and chemical properties of powder (according to AMS specifications for UNS N07718)

	Elements	Minimun	Maximun
Materials composition (%weight)	Fe	Balance	
	Ni	50,00	55,00
	Cr	17,00	21,00
	Nb	4.75	5.50
	Mo	2.80	3.3,
	Ti	0.65	1.15
	Si	0.20	0.80
Particle size (µm)*	D10	≥ 15	
	D50	37	
	D90	≤ 55	

\* Data certified by powder provider of AddUp

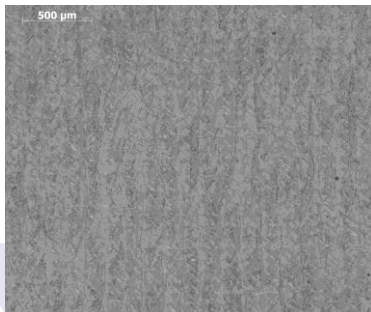
## Mechanical Properties:

Mechanical properties of parts of (XY) directions

		As-Build *	After Heat treatment
Ultimate tensile strength (MPa /ksi)	(XY)	1050 / 153	1450 / 210
	(Z)		1350 / 195
Yield strength, Rp0,2% (MPa /ksi)	(XY)	780 / 113	1280 / 185
	(Z)		1180 / 171
Elongation at break E5d(%)	(XY)	28	18
	(Z)		16
Young's Modulus (GPa)	(XY)	215	210
	(Z)		
Charpy impact test (KCV J/cm <sup>2</sup> )	(XY)	99	39
	(Z)		
Compactness			≥ 99.9%

\* Typical value

## Microstructure



Microstructure obtained by SLM (after etching)

The microstructure obtained during SLM with Inconel 718 is composed of austenitic  $\gamma$ -phase. The picture shows the regular structure of melting tracks.

Optical image of a surface perpendicular to the build direction

## Observation by Scanning Electron Microscopy of the powder

