MAKINO
Promise of Performance

Ni718

Ni-based Superalloy Powder for Additive Manufacturing
90/45 µm, Gas Atomized
Designed for LMD

Chemical composition similar to UNS N07718, INCONEL® 718

DESCRIPTION

Ni718 is a gas atomized nickel superalloy powder engineered for additive manufacturing (AM).This material is well known for its superior mechanical properties under high and cryogenic temperatures.

The material's heat and corrosion-resistant characteristics enable a wide range of applications across various industries.This material is ideally suited for applications requiring a combination of strength, creep, and fatigue at high and low temperatures.The material is able to reach high strength and hardness after heat treatment, making it a versatile selection for a wide range of applications.

KEY PROPERTIES

- High corrosion resistance
- Creep and fatigue resistance at high temperatures
- Retains excellent tensile and yield properties at high temperatures
- High hardness after heat treatment

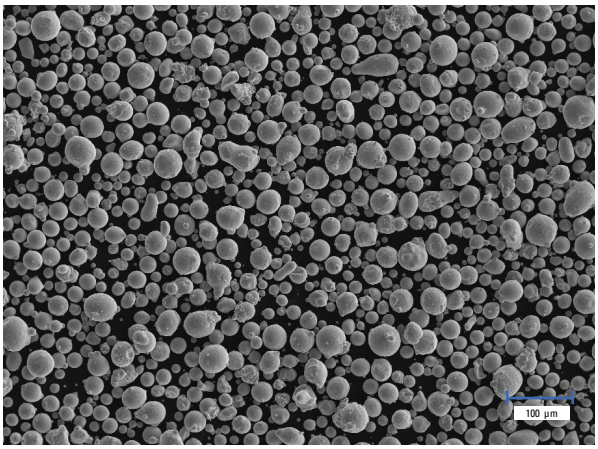
APPLICATIONS

- Gas turbine components
- Instrumentation components
- Aerospace engine parts
- Cryogenic components
- General engineering applications

POWDER CHEMICAL COMPOSITION

Element	Min. (wt%)	Max. (wt%)
Ni	50.0	55.0
Cr	17.0	21.0
Fe	Bal.	Bal.
Nb	4.75	5.5
Mo	2.8	3.3
Ti	0.65	1.15
Al	0.2	0.8
C	-	0.08

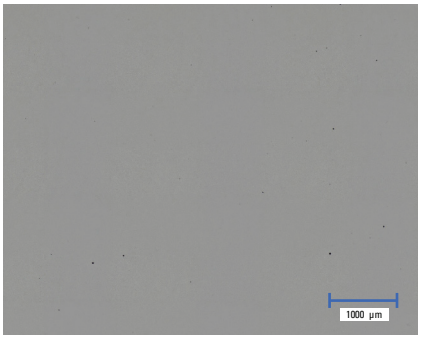
SEM IMAGE



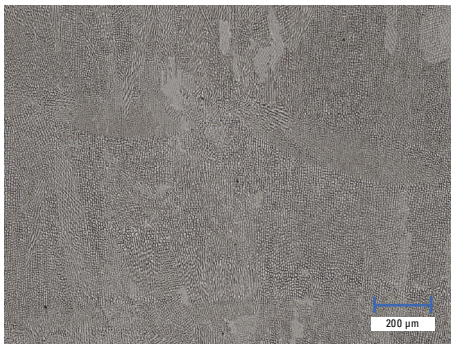
POWDER PROPERTIES (ISO 4490, ISO 3923-1)

Particle Size Distribution (µm)	Hall Flow (s/50g)	Apparent Density (g/cm³)
45 – 90	15.0	4.4

MICROGRAPHS



Polished Surface



Microstructure

PHYSICAL PROPERTIES (ISO 3369)

Average Defect Percentage (%)	Density (g/cm³)
< 0.10	> 8.21

MELTING POINT

Celsius (°C)	Fahrenheit (°F)
1370 - 1430	2500 - 2600

HARDNESS (ISO 6507-1)

$HV_{0.3}$
455

MECHANICAL PROPERTIES (ISO 6892-1)

Condition	Orientation	Ultimate Tensile Strength (MPa)	0.2% Yield Strength (MPa)	Elongation at Break (%)
As-Built	Horizontal	931 ± 5	501 ± 14	34 ± 2
	Vertical	1012 ± 5	548 ± 6	32 ± 1
Heat-Treated	Horizontal	1224 ± 6	1057 ± 14	13 ± 4
	Vertical	1265 ± 40	1124 ± 10	21 ± 1

PROCESS INFORMATION:

The properties reported in this Technical Data Sheet are applicable to Makino AM powders tested and distributed by Makino and processed on Makino LMD machine utilizing parameters in accordance with relevant operating guidelines (inclusive of setup conditions and maintenance). The properties are obtained by following recommended protocols. Further information regarding the methods used by Makino can be provided upon inquiry.

DISCLAIMER:

The data and information provided represent, to the best of our knowledge, standard or average values and do not constitute guarantees for upper and lower limit parameters. The recommended applications for the material disclosed are exclusively for illustrative purposes that help the reader to conduct their independent assessments. These suggestions are not intended to be expressed or implied warranties of suitability for the specified applications or any other purposes. The information included may be subject to change at any time without prior notification.

CONTACT US:

Our Safety Datasheet (SDS) is available upon request. For more information or support please contact Makino at sales-am@makino.com.sg or visit www.makino.com.sg

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