

OptiPowder Ni625: High-Performance Nickel Alloy for Corrosion-Resistant, High-Temperature Applications

Overview

OptiPowder Ni625 (UNS N06625) is a nickel-chromium-molybdenum-niobium alloy engineered for excellent corrosion resistance, high-temperature stability, and strong mechanical performance in extreme environments. It maintains strength across a wide temperature range and resists fatigue, oxidation, and stress corrosion cracking, making it a reliable choice for demanding advanced manufacturing applications.

OptiPowder Ni625 is produced using Continuum's M2P gas atomization system, a plasma-based process that converts qualified reclaimed metal into high-quality spherical powder in a single step. Powered by green energy and tightly controlled process conditions, this approach reduces the carbon footprint of powder production while delivering consistent chemistry, flowability, and particle morphology from lot to lot.

Typical Applications

OptiPowder Ni625 is engineered for high-performance components operating in corrosive and high-temperature environments, including:



Aerospace engine components, exhaust systems, and thermal structures



Marine and subsea hardware exposed to saltwater environments



Chemical processing and waste treatment equipment handling aggressive media



Energy and power-generation systems, including nuclear and gas processing

Nominal Composition (wt.%)

Element	Min	Max
Ni	Balance	Balance
Cr	20.0	23.0
Mo	8.00	10.00
Fe	-	5.00
Nb	3.15	4.15
Co	-	1.00
Mn	-	0.50

Element	Min	Max
Si	-	0.50
Ti	-	0.40
Al	-	0.40
C	-	0.10
P	-	0.015
S	-	0.015

Conforms to ASTM F3056 (where applicable)

Powder Physical Properties

Property	Unit	Max
Apparent Density	g/cc	>4.0
Tapped Density	g/cc	>5.0
Hall Flow Time	s/50g	<20

Data representative of LPBF particle size distribution.

Additive Manufacturing Process Compatibility

OptiPowder Ni625 supports a wide range of AM and advanced manufacturing processes, including::

Laser Powder Bed Fusion (LPBF):

Complex geometries with excellent mechanical properties

Electron Beam Melting (EBM):

Large, high-temperature components requiring strength and durability

Binder Jetting (MBJ):

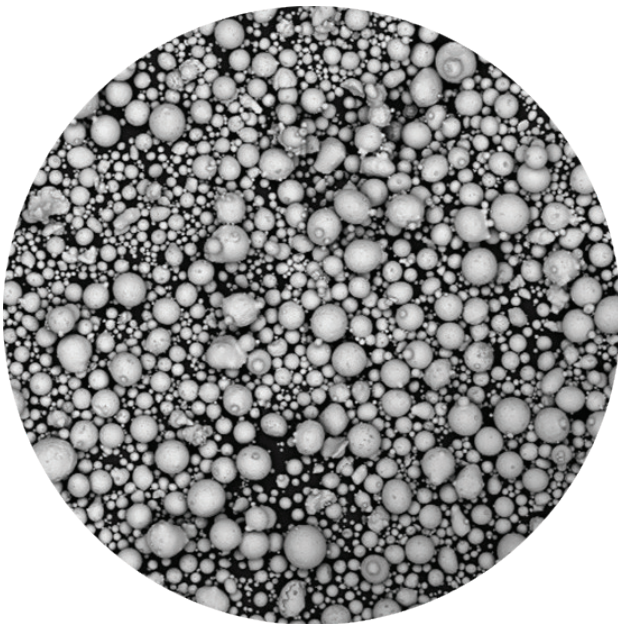
Cost-effective production of larger parts prior to densification

DED and other advanced routes:

Where controlled PSD and chemistry are critical

Available PSDs & Customization

OptiPowder Ni625 is available in multiple particle size distributions, including 0–15 μm , 0–25 μm , 0–45 μm , 15–45 μm , 45–90 μm , 45–106 μm , and HIP-grade material, with custom PSDs and program-based supply available on request.



Morphology

Powder morphology is predominantly spherical with minimal satellites, with no hollow particles, excessive agglomeration, or foreign-object defects visible at $\sim 300\times$ magnification.

Blending

Multiple heats may be blended into a single lot when each heat independently meets all chemical and PSD requirements.

Certification

Each shipment includes a certificate of analysis reporting chemical composition, particle size distribution, and any additional agreed-upon test results demonstrating conformance to specifications.