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OptiPowder NiCu 400:
Corrosion-Resistant Nickel-Copper Alloy for Marine and Chemical Environments

Overview

OptiPowder NiCu 400 (UNS N04400) is a solid-solution nickel-copper alloy designed for excellent corrosion resistance, high strength, and reliable performance across a wide temperature range. The alloy performs well in marine, chemical, and brine environments, maintaining mechanical integrity without a ductile-to-brittle transition at low temperatures.

OptiPowder NiCu 400 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 NiCu 400 is engineered for components operating in corrosive environments, including:

- Marine and offshore hardware exposed to seawater and brine
- Industrial components requiring strength across a wide temperature range
- Chemical processing equipment handling aggressive media
- Energy and power systems requiring corrosion resistance and durability

Nominal Composition (wt.%)

Element	Min	Max
Ni	63.0	70.0
Cu	Balance	Balance
Fe	-	2.5
Mn	-	2.0
C	-	0.3
Si	-	0.5
S	-	0.024

Aligned with UNS N04400 specification (composition may be tailored per application requirements).

Powder Physical Properties

Property	Unit	Max
Apparent Density	g/cc	>4.5
Tapped Density	g/cc	>5.5
Morphology	Spherical	
Hall Flow Time	s/50g	<15

Data representative of 15–45 µm PSD..

Additive Manufacturing Process Compatibility

OptiPowder NiCu 400 supports a range of AM and advanced manufacturing processes, including:

Laser Powder Bed Fusion (LPBF):
Corrosion-resistant components with complex geometries

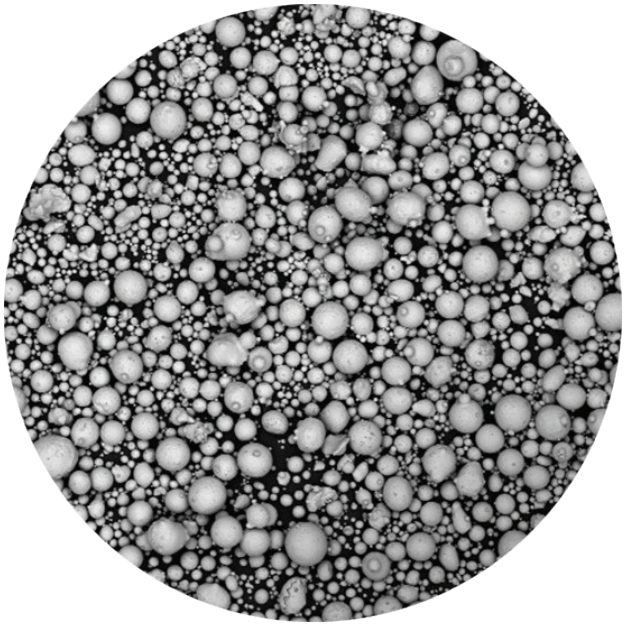
Thermal spray and conventional routes:
Where corrosion resistance and conductivity are critical

Binder Jetting (MBJ):
Cost-effective production of larger parts prior to densification

Directed Energy Deposition (DED):
Repair and build-up of corrosion-resistant components

Available PSDs & Customization

OptiPowder NiCu 400 is available in multiple particle size distributions, including 0–15 µm, 15–45 µm, 15–63 µm, 45–106 µm, and HIP-grade material, with custom PSDs, blended distributions, and program-based supply available on request to support specific process requirements and qualification needs.



Morphology

Powder morphology is predominantly spherical with minimal satellites, with no hollow particles, excessive agglomeration, or foreign-object defects visible at ~300× 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.

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