

Material Product Data Sheet

Pure Nickel Alloy for Additive Manufacturing

Powder Products: MetcoAdd NiCP-A

1 Introduction

MetcoAdd™ NiCP-A is a pure element nickel powder with chemistry similar to Nickel 201.

Room temperature static properties of PBF-LB processed and heat treated material coupons have been shown to be comparable to those of Nickel 201.

For reference purposes Oerlikon has processed MetcoAdd NiCP-A using fixed parameters and 120 µm layer thickness to provide data in Section 3 Key Processing Information. Additional testing has been performed by an extensive network of consortia and customer partners on a broader range of machine types. Properties may be optimized based on application specific requirements.

All of our NiCP-A products for additive manufacturing are designed for processing using Laser Powder Bed Fusion (PBF-LB) systems and are also suited for CSAM (Cold Spray Additive Manufacturing).

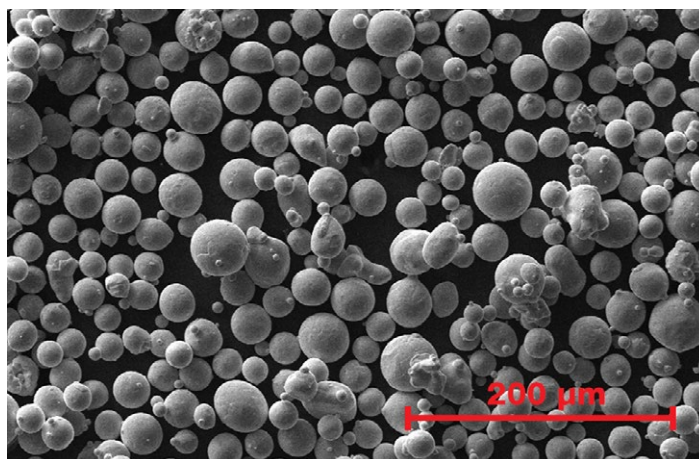
1.1 Typical Uses and Applications

- Semiconductor

MetcoAdd NiCP-A is a commercially pure nickel powder designed specifically for laser beam powder bed fusion (PBF-LB). It is similar in composition to UNS N02200 and UNS N02201. At room temperature, builds produced from MetcoAdd NiCP-A have demonstrated properties similar to UNS N02200 and UNS N02201 without cracking. Components printed using MetcoAdd NiCP-A have excellent corrosion resistance to many media and exhibit very good thermal and electrical conductivity.

Quick Facts

Classification	Alloy, nickel-based
Chemistry	UNS N02201
Manufacture	Inert gas atomized (Argon)
Morphology	Spherical
Apparent Density	4 to 5 g/cm ³
Melting Temperature	≈ 1455 °C (2690 °F)
Process	Laser Powder Bed Fusion (PBF-LB) CSAM (Cold Spray Additive Manufacturing)



Typical spherical morphology of these gas-atomized powders

2 Material Information

2.1 Chemical Composition

Product	Weight Percent (nominal)	
	Ni	C
MetcoAdd NiCP-A	99.5+	0.02

2.2 Particle Size Distribution

Product	Nominal Range [µm]	D90 [µm]	D50 [µm]	D10 [µm]	Hall Flow (s/50 g)
MetcoAdd NiCP-A	-53 +15	60	37	19	30

For the nominal range, particle size analysis 45 µm or above measured by sieve (ASTM B214), analysis below 45 µm by laser diffraction (ASTM C 1070, Microtrac). Fractional analysis (D90, D50, D10) by laser diffraction, Hall flow by ASTM B213.

2.3 Related Products

- Oerlikon Metco offers other nickel-based powders designed for additive manufacturing that have been optimized for either powder fed or powder bed processes. Please contact your Oerlikon Metco Account Representative for more information.
- Oerlikon Metco can produce MetcoAdd NiCP-A powder in different particle size distributions on request for large volume users.

3 Key Processing Information

3.1 Typical Post Heat Treatment Properties (MetcoAdd NiCP-A) ^{a, b, c}

Specification		EOS M400-1
Ultimate Tensile Strength (MPa), XY/Z [*]	ASTM E8	341 ± 7 / 334 ± 10 [*]
Yield Strength (MPa), XY/Z [*]		229 ± 9 / 222 ± 8 [*]
Elongation at break %, XY/Z [*]		15 ± 1 / 19 ± 1 [*]
Relative Density % [*]		> 99.5% [*]

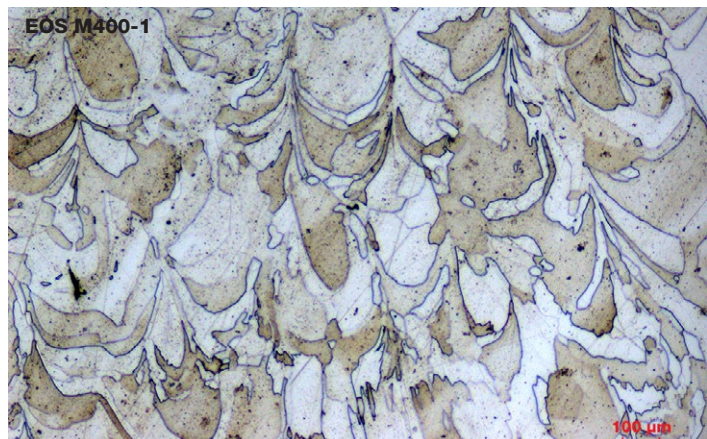
^a Disclaimer: All data published in this datasheet has been shared for reference purposes only and is not sufficient to design or certify parts. No warranty or guarantee is made against these results.

^b Bounds are based on one standard deviation of each population with ten samples per orientation and machine. Test specimens were 6.35 mm (0.25 in) diameter round bars machined from coupons of 75 x 75 x 13 mm (3 x 3 x 0.5 in) coupons. Direction XY data is an average of both X and Y horizontal build orientations.

^c Stress relief only.

^{*} Values based on 120 micron layers, reduced layer thickness + heat treatment to result in increased mechanical properties

3.2 Post Heat Stress Relief Microstructure, Vertical Build Direction (MetcoAdd NiCP-A)



3.3 Additive Manufacturing Services

Oerlikon AM is an excellent source for pilot and production run additive manufacturing services and is ready to serve

your needs. Please contact your Oerlikon Metco account manager for more information or contact Oerlikon AM directly through their web site at www.oerlikon.com/am.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size ^a	Availability	Distribution
MetcoAdd NiCP-A	2366371	10 kg (approx. 22 lb)	Stock	Global

^a Larger and/or custom packaging can be arranged for large volume users

4.2 Handling Recommendations

- Blend contents prior to use to prevent segregation
- Keep in the original container, or an approved alternative, tightly closed when not in use
- Powder from previously opened containers should be stored in a humidity-controlled environment

4.3 Safety Recommendations

See the SDS (Safety Data Sheet) in the version localized for the country where the material will be used. SDS are available from the Oerlikon web site at www.oerlikon.com/metco (Resources – Safety Data Sheets).

Product	SDS No.
MetcoAdd NiCP-A	50-2935

Information is subject to change without prior notice.