cunova

Copper Powder
for Additive Manufacturing

INDUSTRIAL
APPLICATIONS

cunova Copper Powder

cunova offers copper powder for additive manufacturing based on its high-quality materials. The production of the copper powders is done by melting the known cunova alloys in order to achieve the highest requirements for purity and composition.

Description

The cunova copper powders are produced by gas atomisation with subsequent screening and air separation processes. This ensures that the cunova copper powder has almost spherical particles, optimal particle sizes and a good particle size distribution.

This results in a high flowability and very good bulk density. In addition, cunova copper powders are characterized by very low humidity.

In the additive manufacturing process, this combination of properties leads to a uniform and dense copper powder layer. The component density achievable with cunova copper powders is very high.

Available Materials and Alloys Are:

- Cu-ETP
- Cu-HCP
- CuAg0.1P
- CuTeP
- CuCr1Zr
- CuNi2.5SiCr
- CuNi30Mn1Fe
- NiCu30Fe

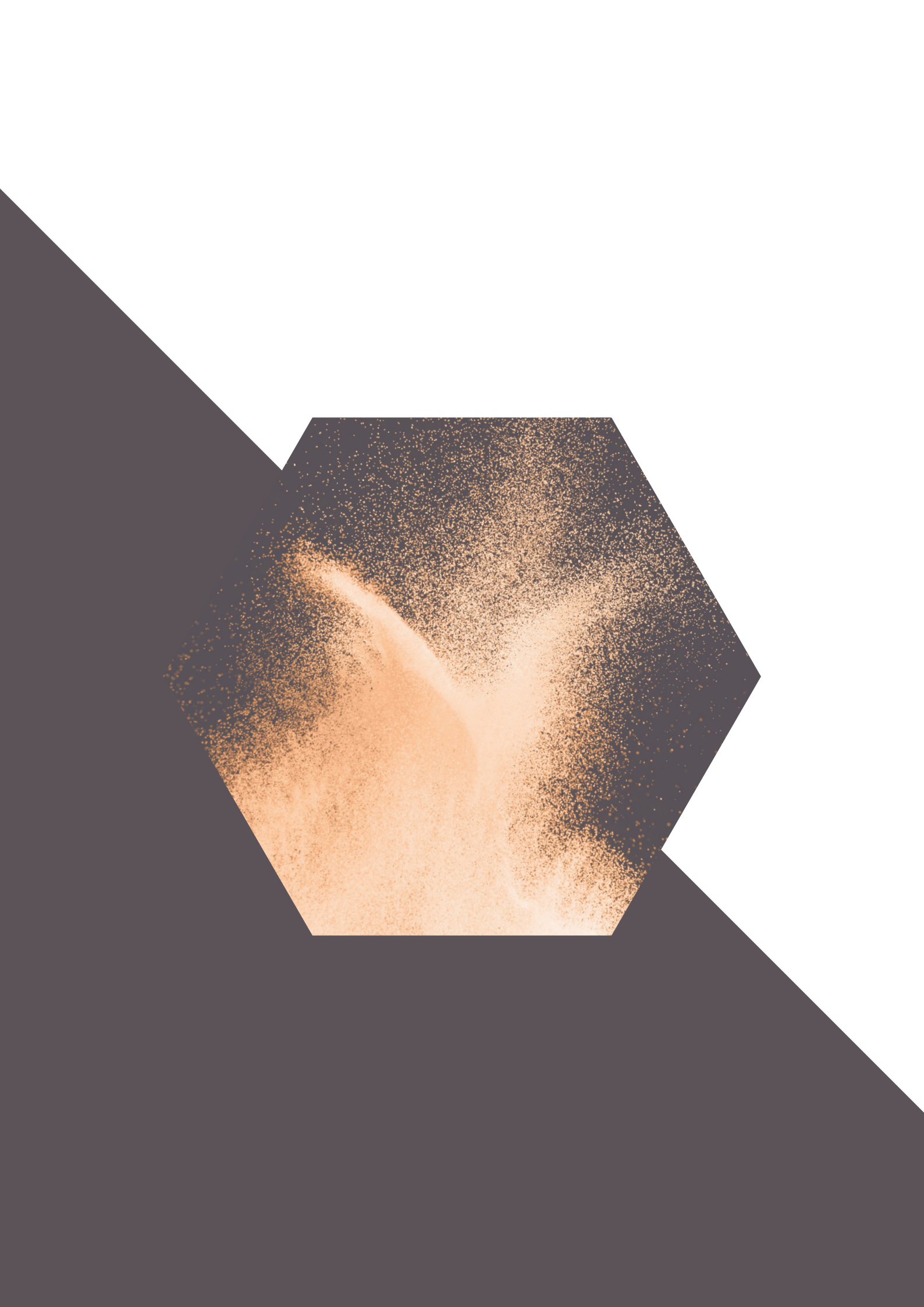
Other materials can be supplied on request.

Technical Data

Table 1 lists the unalloyed and low-alloyed copper powders. The Cu-ETP with a purity grade >99.9% is characterized by highest electrical and thermal conductivity. A higher purity of 99.99% (Cu-OF quality) can be supplied on request. The Cu-HCP and CuAg0.1P offer an increased recrystallization temperature while still maintaining a very high conductivity of the printed component.

The age-hardenable copper powders CuCr1Zr and CuNi2.5SiCr achieve highest strengths after the selective manufacturing process by age-hardening and belong to the thermally most stable copper alloys, Table 2.

The high-alloyed copper-based alloy CuNi30Mn1Fe is characterised by high corrosion resistance and is primarily used in seawater. The nickel-based material NiCu30Fe has even higher strength values. In addition to higher seawater resistance, the high temperature resistance in a carbon-rich atmosphere is excellent.



CUNOVA COPPER POWDER

Unalloyed and Low-Alloyed cunova Powders

cunova copper powder		Cu-ETP*	Cu-HCP	CuAg0.1P	CuTeP
Material	EN	CW004A	CW021A	CW016A	CW118C
	ASTM	C11000	C10300	C10700	C14500
Material Composition	%	Other elements: max. 0.03 Cu>99.99% incl. Ag, O	P 0.004 Other elements: max. 0.03 rest Cu	Ag 0.1 P 0.004 Other elements: max. 0.05 rest Cu	Te 0.5 P 0.008 Other elements: max. 0.1 rest Cu
Flowability	s/50g	-**	16	16	-**
Bulk Density	g/cm³	4.8	4.6	4.7	-
Moisture	%	<0.01	<0.01	<0.01	<0.01

Table 1. *A higher purity of 99.99% (Cu-OF quality) can be supplied on request. The oxygen content is analysed on the finished powder. Due to an oxidation on the powder surface, the oxygen content is higher after production and storage.

** Flowability optimized for L-PBF/SLM

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Hardenable cunova Copper Powders and Copper-Nickel and Nickel-Copper cunova Powders

cunova copper powder		CuCr1Zr	CuNi2.5SiCr	CuNi30Mn1Fe	NiCu30Fe
Material	EN	CW106C	-	CW354H	2.4360
	ASTM	C18150	C18000	C71520	N04400
Material Composition	%	Cr 0.65 Zr 0.08 Other elements: max. 0.2 rest Cu	Ni 2,5 Si 0,65 Cr 0.3 Other elements: max. 0.3 rest Cu	Ni 31 Mn 0.8 Fe 0.8 Other elements: max. 0.3 rest Cu	Cu 30 Fe 2 Other elements: max. 3 rest Ni
Flowability*	s/50g	16	15	14	18
Bulk Density	g/cm³	4.2	4.1	4.5	4.1
Moisture	%	<0.01	<0.01	<0.01	<0.01

Table 2. *Flowability optimized for L-PBF/SLM

CUNOVA COPPER POWDER

Available Particle Sizes

Product	Tolerances					
	D10		D50		D90	
	Min	Max	Min	Max	Min	Max
<45 µm	5 µm	15 µm	20 µm	30 µm	40 µm	50 µm
15 – 63 µm	15 µm	30 µm	35 µm	50 µm	50 µm	65 µm
45 – 90 µm	40 µm	55 µm	60 µm	75 µm	80 µm	95 µm
45 – 150 µm	40 µm	55 µm	65 µm	90 µm	100 µm	150 µm

* Particles can be supplied in other specifications on request.

CUNOVA COPPER POWDER

Quality & Safety

Quality Assurance

The consistently high quality of the delivered cunova copper powder is guaranteed through processes of quality assurance.

- Particlesize measurement by dynamic image analysis according to ISO 13322-2
- Particle shape by means of metallographic investigation methods
- Flowability according to DIN EN ISO 4490
- Bulk density according to DIN EN ISO 3923-1
- Moisture measurement

Legal Information

The information provided corresponds to our knowledge and level of experience at the time of publication.
In the context of the continuous development and improvement processes the information can change without prior notice.

Safety Instructions

See cunova safety data sheet at:
www.cunova.com/en/service/downloads

Further Information on Copper Powder:

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