Material
Data Sheet

EOS CopperAlloy CuNi30

Excellent Corrosion Resistance in Salt Water

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EOS CopperAlloy CuNi30 is a copper alloy with excellent corrosion resistance in salt water. It has good strength and ductility. CuNi30 has good ductility also in very low temperatures. Material is in accordance with UNS 96400.

Main Characteristics:

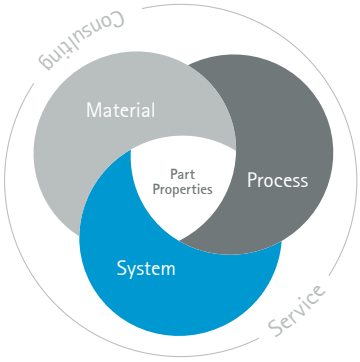
- Good corrosion resistance in salt water
- Performance in very low temperatures
- Stable processability

Typical Applications:

- Pumps and impellers
- Marine applications

The EOS Quality Triangle

EOS uses an approach that is unique in the AM industry, taking each of the three central technical elements of the production process into account: the system, the material and the process. The data resulting from each combination is assigned a Technology Readiness Level (TRL) which makes the expected performance and production capability of the solution transparent.



EOS incorporates these TRLs into the following two categories:

- Premium products (TRL 7-9): offer highly validated data, proven capability and reproducible part properties.
- Core products (TRL 3 and 5): enable early customer access to newest technology still under development and are therefore less mature with less data.

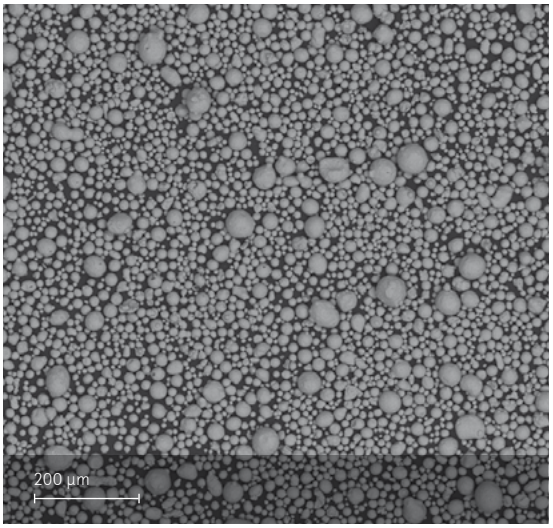
All of the data stated in this material data sheet is produced according to EOS Quality Management System and international standards.

Powder Properties

CuNi30 is a copper alloy according to ASTM B369-09 UNS 96400.

Powder chemical composition (wt.-%)

Element	Min	Max
Cu	Balance	
Pb	-	0.01
Fe	0.25	1.5
Ni	28.0	32.0
Mn	-	1.5
Si	-	0.50
Nb	0.50	1.5
P	-	0.02
S	-	0.02
C	-	0.15



SEM micrograph of EOS CopperAlloy CuNi30 powder.

Powder particle size

Generic particle size distribution	15-63 µm

Modulus of elasticity

State	As manufactured
Modulus of elasticity [GPa] Vertical	145
Modulus of elasticity [GPa] Horizontal	155

Testing according to EN ISO 6892-1 Method A, Range 1 (0,00007 1/s)

Impact toughness

Temperature	-85 °C	-20 °C	0 °C	Room temperature
As manufactured vertical [J]	190	190	185	175
Heat treated vertical [J]	-	120	115	120

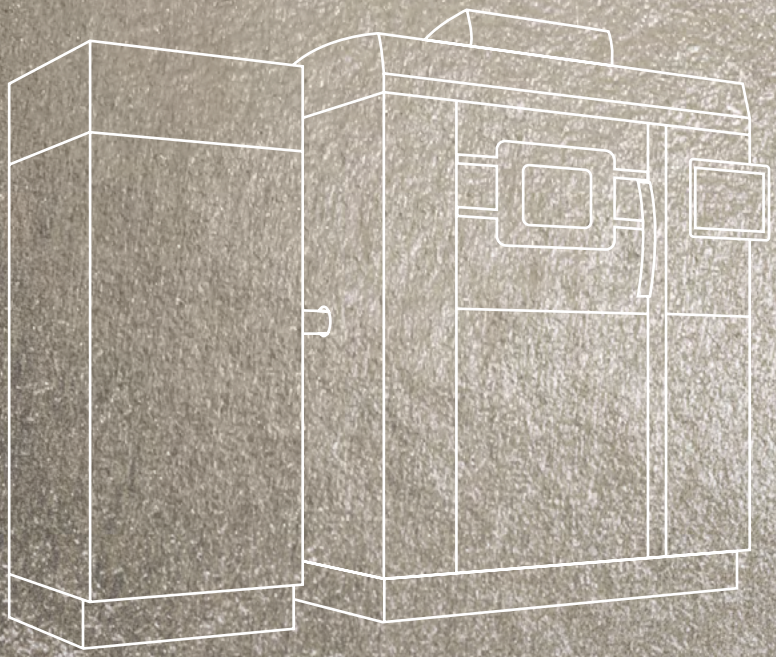
Testing according to ISO 148-1, Charpy-V.

Coefficient of Thermal Expansion ASTM E228

Temperature	25 – 100 °C	25 – 200 °C	25-300 °C	25-400 °C	25-500 °C	25-600 °C
CTE	$14.0*10^{-6}$/K	$15.6*10^{-6}$/K	$16.1*10^{-6}$/K	$16.5*10^{-6}$/K	$16.8*10^{-6}$/K	$17.2*10^{-6}$/K

TRL 3

EOS Core



EOS CopperAlloy CuNi30
for EOS M 290 | 60 µm

Process Information
Heat Treatment
Physical Part Properties
Mechanical Properties
Additional Data

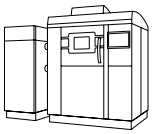
EOS CopperAlloy CuNi30 for EOS M 290 | 60 µm

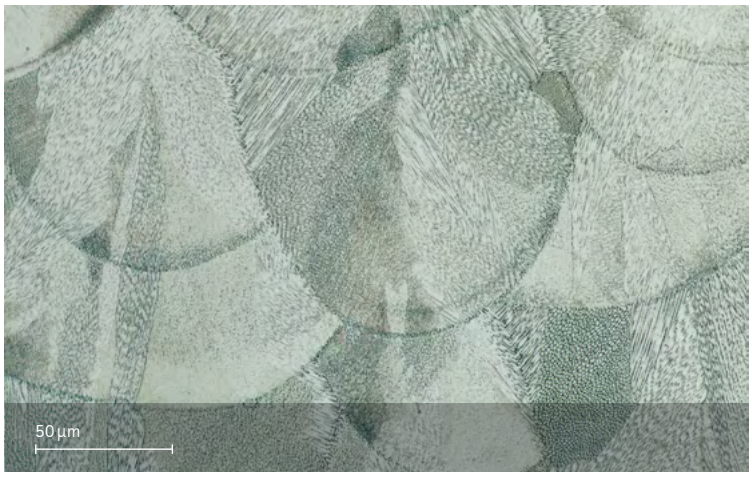
Process Information

System set-up	EOS M 290
EOSPAR name	CuNi30_060_CoreM291
Software requirements	EOSPRINT 2.11 or newer EOSYSTEM 2.15 or newer
Powder part no.	9030-0018
Recoater blade	HSS
Nozzle	EOS grid nozzle
Inert gas	Argon
Sieve	90 µm

Additional information	
Layer thickness	60 µm
Volume rate	5.2 mm^3/s
Typical dimensional change after HT	0.1%

Physical properties of parts[1]





Etched micrograph in as manufactured state

Defects	Result
Average defect percentage	< 0.1 %
Density, ISO3369	≥ 8.88 g/cm³

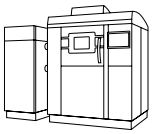
Typical mechanical properties

	Yield strength $R_{p0.5}$ [MPa]	Tensile strength R_m [MPa]	Elongation at break A [%]
As manufactured vertical	370	450	35
As manufactured horizontal	420	500	30
Heat treated vertical	500	610	28
Heat treated horizontal	560	700	22

Testing as per ISO 6892-1

Typical hardness ISO 6508-1	Rockwell
Heat treated (stress relieved)	90 HRB
As manufactured	75 HRB

Heat Treatment

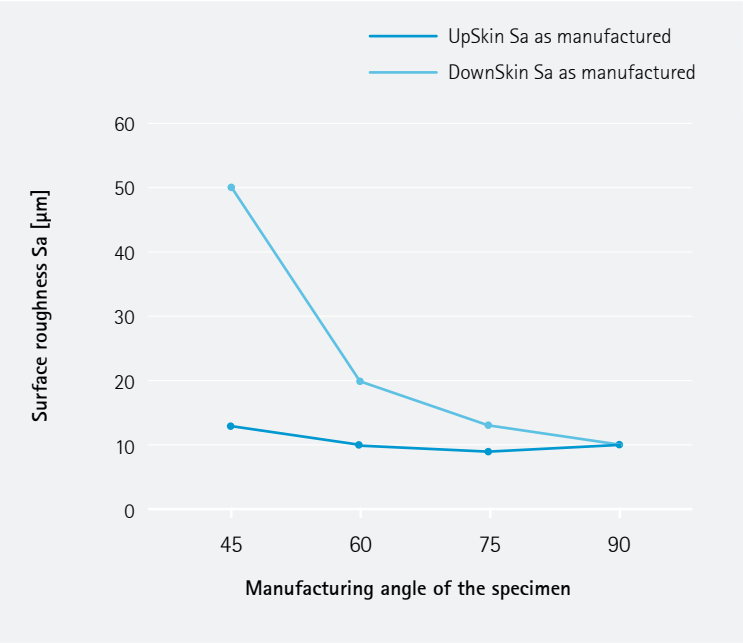


Optional stress relieve

Optional stress relieve at 600 °C for 2 hours. Air cooling.
Stress relieve reduces ductility of material.

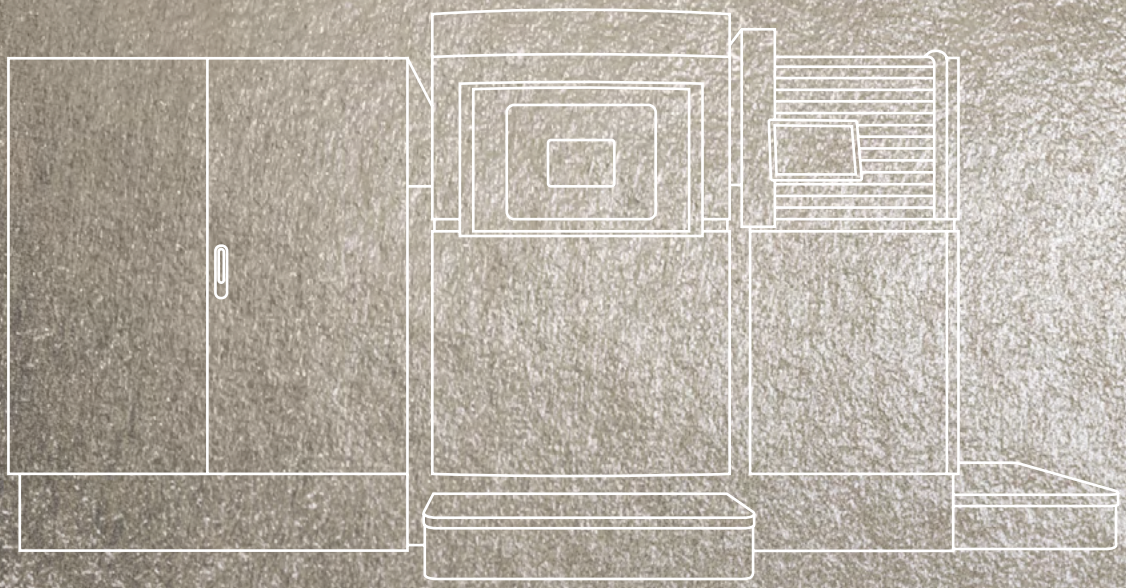
Additional Data[1]

Surface roughness



TRL 3

EOS Core



EOS CopperAlloy CuNi30
for EOS M 400-1 | 60 µm

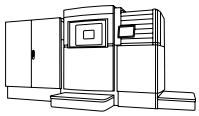
Process Information
Heat Treatment
Physical Part Properties
Mechanical Properties
Additional Data

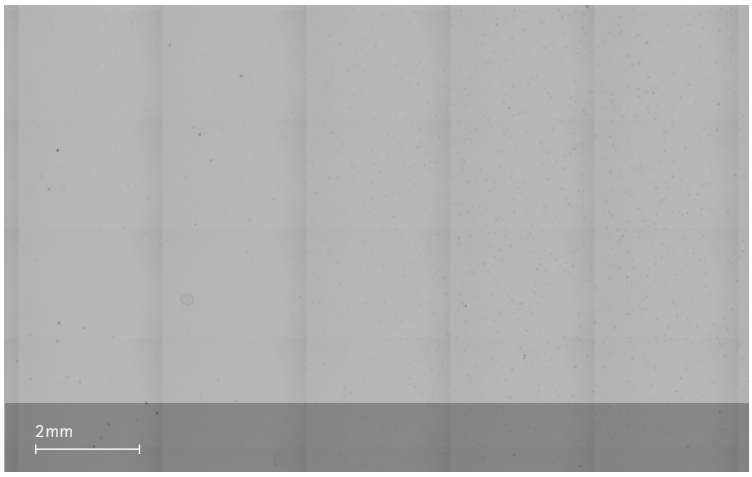
EOS CopperAlloy CuNi30 for EOS M 400-1 | 60 µm
Process Information

System set-up	EOS M 400-1
EOSPAR name	CuNi30_060_CoreM400
Software requirements	EOSPRINT 2.11 or newer EOSYSTEM 2.15 or newer
Powder part no.	9030-0018
Recoater blade	HSS
Inert gas	Argon
Sieve	90 µm

Additional information	
Layer thickness	60 µm
Volume rate	5.2 mm^3/s
Typical dimensional change after HT	0.1%

Physical properties of parts[1]





Micrograph of a polished surface

Defects	**Result**
Average defect percentage	< 0.1 %
Density, ISO3369	≥ 8.88 g/cm³

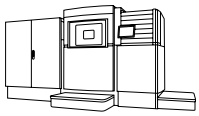
Typical mechanical properties

	Yield strength $R_{p0.5}$ [MPa]	**Tensile strength** R_m [MPa]	**Elongation at break** A [%]
As manufactured vertical	370	420	34
As manufactured horizontal	410	470	30
Heat treated vertical	500	610	28
Heat treated horizontal	560	700	22

Testing as per ISO 6892-1

Typical hardness ISO 6508-1	**Rockwell**
Heat treated (stress relieved)	90 HRB
As manufactured	75 HRB

Heat Treatment

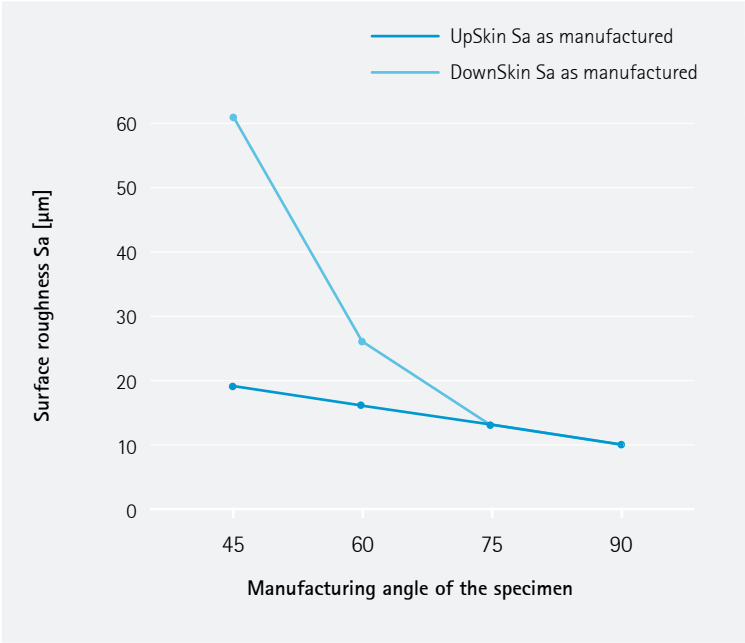


Optional stress relieve

Optional stress relieve at 600 °C for 2 hours. Air cooling.
Stress relieve reduces ductility of material.

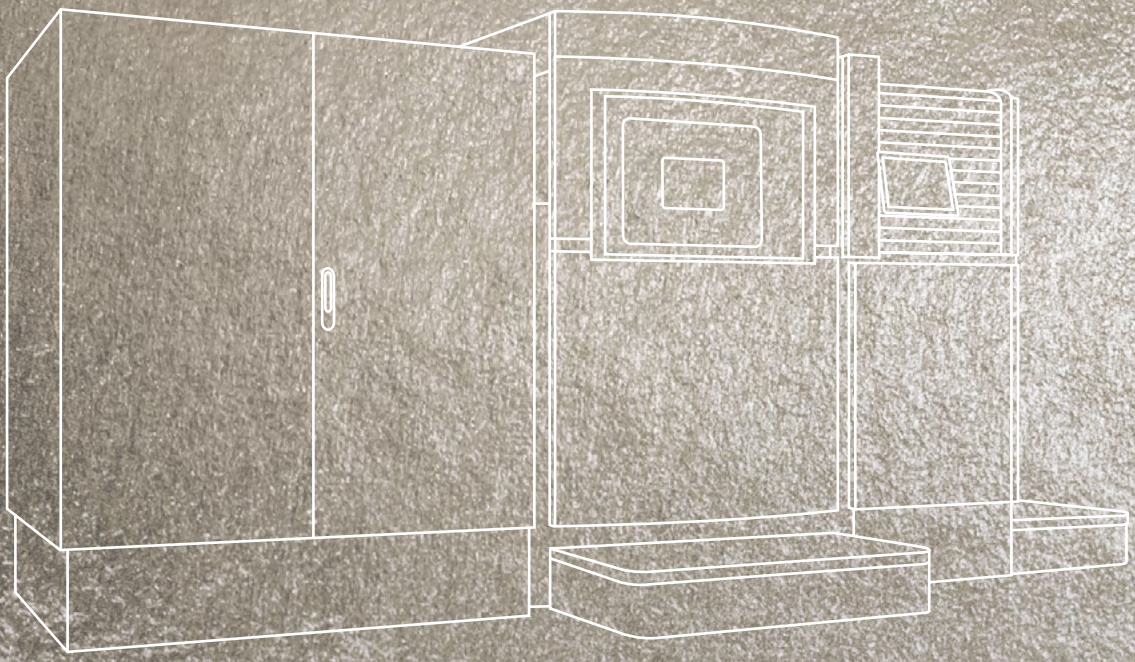
Additional Data[1]

Surface roughness



TRL 3

EOS Core



EOS CopperAlloy CuNi30
for EOS M 400-4 | 60 µm

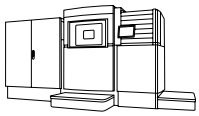
Process Information
Heat Treatment
Physical Part Properties
Mechanical Properties
Additional Data

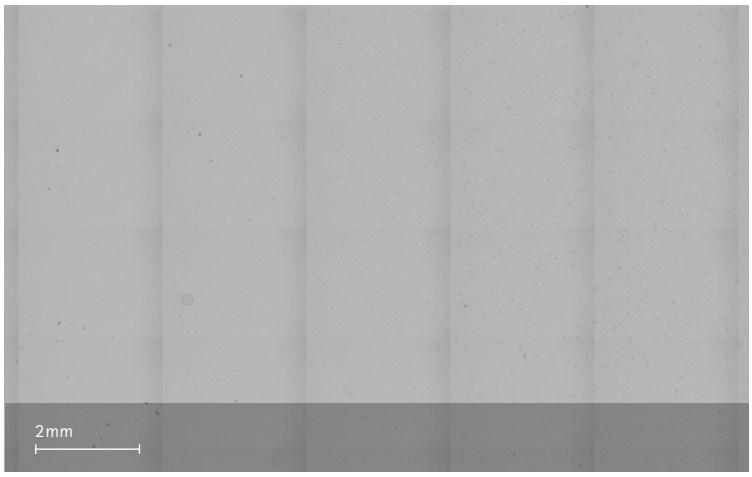
EOS CopperAlloy CuNi30 for EOS M 400-4 | 60 µm
Process Information

System set-up	EOS M 400-4
EOSPAR name	CuNi30_060_CoreM404
Software requirements	EOSPRINT 2.11 or newer EOSYSTEM 2.15 or newer
Powder part no.	9030-0018
Recoater blade	HSS
Inert gas	Argon
Sieve	90 µm

Additional information	
Layer thickness	60 µm
Volume rate	4 x 5.2 mm^3/s
Typical dimensional change after HT	0.1%

Physical properties of parts[1]





Micrograph of a polished surface

Defects	Result
Average defect percentage	< 0.1 %
Density, ISO3369	≥ 8.88 g/cm³

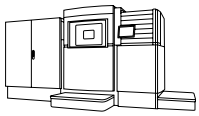
Typical mechanical properties

	Yield strength $R_{p0.5}$ [MPa]	Tensile strength R_m [MPa]	Elongation at break A [%]
As manufactured vertical	375	445	26
As manufactured horizontal	410	480	31
Heat treated vertical	500	610	28
Heat treated horizontal	560	700	22

Testing as per ISO 6892-1

Typical hardness ISO 6508-1	Rockwell
Heat treated (stress relieved)	90 HRB
As manufactured	75 HRB

Heat Treatment

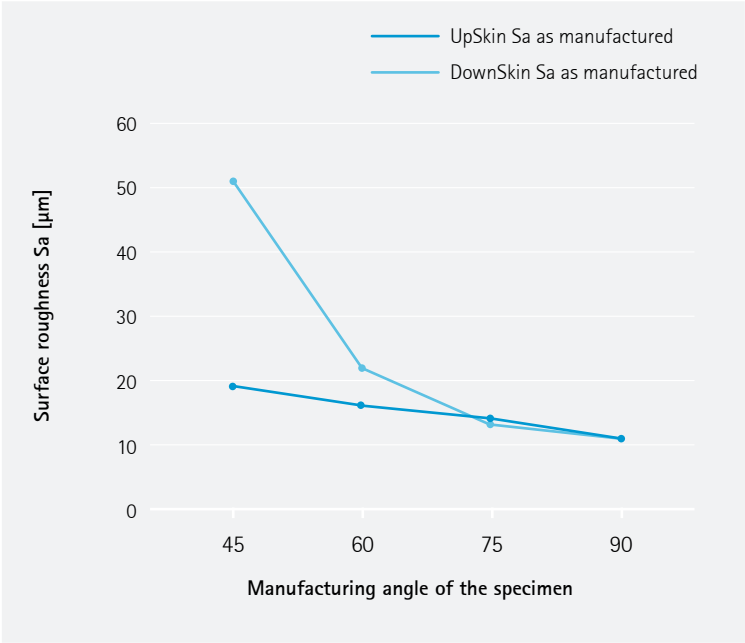


Optional stress relieve

Optional stress relieve at 600 °C for 2 hours. Air cooling.
Stress relieve reduces ductility of material.

Additional Data[1]

Surface roughness



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Status 04/2024

Cover: This image shows a possible application.

[1] **Part properties are provided for information purposes only and EOS makes no representation or warranty, and disclaims any liability, with respect to actual part properties achieved.** Part properties are dependent on a variety of influencing factors and therefore, actual part properties achieved by the user may deviate from the information stated herein.

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