

# Certified CuCr2.4 (A)

Certified CuCr2.4 (A) is copper alloy offering improved strength, ductility, and as-built surface finish compared to commercially pure copper while retaining high thermal and electrical conductivity. 3D Systems offers application development and part production using the integrated additive manufacturing (AM) workflow software, 3DXpert®, and the DMP Flex and Factory 350 metal 3D printer. 3D Systems' CuCr2.4 parameters were developed, tested, and optimized on real applications in our AS9100/ISO9001 part production facilities, which have the unique distinction of printing more than 1,000,000 challenging metal production parts in various materials, year over year.

The final part properties can be tailored by different heat treatments, balancing mechanical properties and conductivity based on application needs. For companies looking to develop new applications and processes with CuCr2.4, our AIG experts can support and accelerate application development as well as tune the heat treatment to the application needs.

## Material Description

CuCr2.4 is a precipitation hardenable copper alloy with increased strength over pure copper while retaining very high electrical and thermal conductivity. At the same time, CuCr2.4 also exhibits good corrosion resistance. It is also easy to process thanks to the high percentage of chromium.

These properties render the material ideal for heat management or electrical applications, especially when there is a combined structural function. CuCr2.4 is ideal for applications such as heat exchangers, cooling components and heat sinks to induction coils and electrical components.



Part height: 61 mm  
Print time: 7h 49m 21s, batch size 1

## Mechanical Properties

DMP FLEX 350 , DMP FACTORY 350 – LT60	TEST METHOD	HT - 500 °C		HT - 1000 °C	
		METRIC	U.S.	METRIC	U.S.
Ultimate tensile strength (MPa   ksi) Horizontal direction – XY	ASTM E8	799	115	270	39
Yield strength Rp0.2% (MPa   ksi) Horizontal direction – XY		729	105	136	20
Plastic elongation (%) Horizontal direction – XY		13		46	
Electrical conductivity (% IACS) <sup>2</sup> Horizontal direction – XY	ASTM B193	~61		~93	
Relative density (%) – LT60	Optical method (pixel count)	99.9			

<sup>1</sup> No surface treatment applied, measured in as printed condition.

<sup>2</sup> International Annealed Copper Standard.

Layer thickness 60  $\mu\text{m}$  – Theoretical productivity 19 cc/h

## Heat Exchanger

A variable double gyroid creates two separate fluid domains while baffles prevent blending. External ribs provide additional strength. CuCr2.4 is ideal at enabling a thermal conductivity up to 93% IACS after heat treatment.



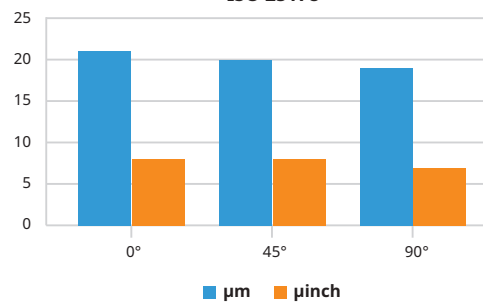
Part height: 101 mm  
Print time 4h, batch size 1  
Layer thickness: 60 $\mu\text{m}$

As-built surface quality with no post-finishing

## Typical Applications Include:

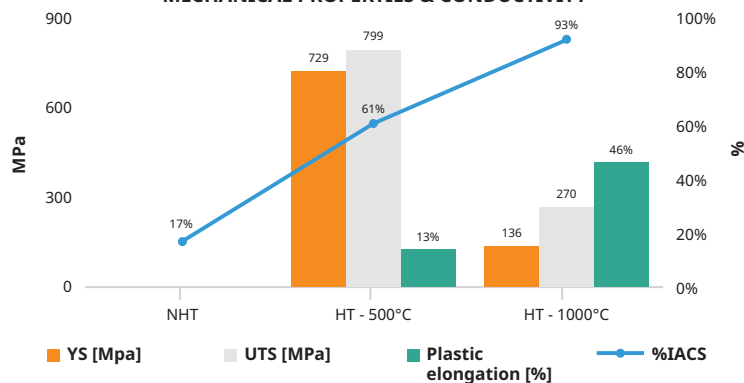
- Heat Exchangers
- Heat Sinks
- Cooling Components
- Connectors
- Induction Coils
- Electrodes
- Circuit breaker parts

**SURFACE ROUGHNESS RA<sup>1</sup> - LT60  
ISO 25178**



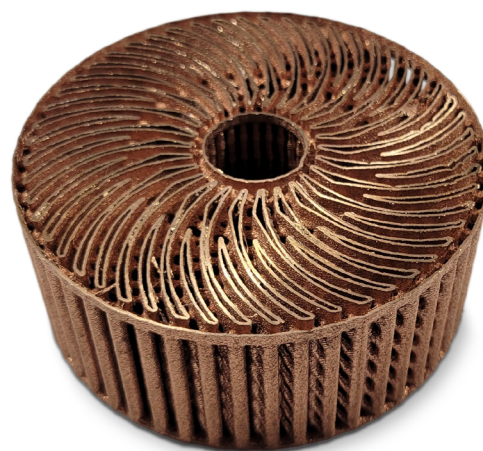
As-built property

**MECHANICAL PROPERTIES & CONDUCTIVITY**



## Heat Exchanger

The surface-area-to-volume ratio maximizes drive thermal transfer efficiency, combined with CoCr2.4 to utilize high thermal conductivity up to 93%IACS.



Part height: 34.5 mm  
Print time: 4.5h, batch size 1  
Layer thickness: 60 $\mu\text{m}$   
As-built surface quality with no post-finishing

To confirm the suitability of this material for your specific application, please contact the 3D Systems Application Innovation Group (AIG):  
<https://www.3dsystems.com/consulting/application-innovation-group>

CuCr2.4 powder with product reference MA-CCR25H can be purchased directly from Mitsui-Kinzoku: [kinoufun@mitsui-kinzoku.com](mailto:kinoufun@mitsui-kinzoku.com)