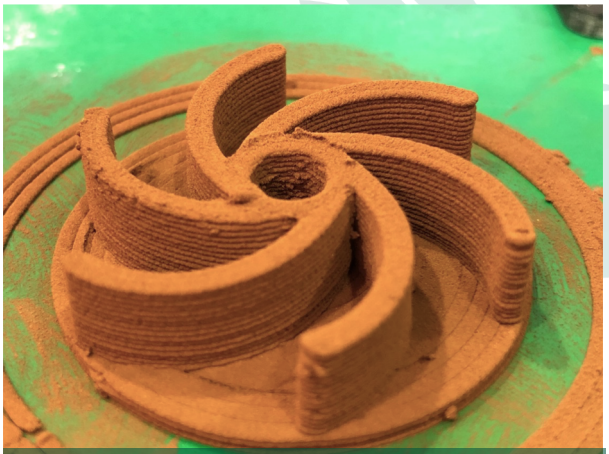
Demonstrator Fact-Sheet
Copper Heat Sink with customized shape

FENIX Copper Powder is obtained by electrowinning, ***recycling of Waste from Electrical and Electronic Equipment (WEEE)***.
The Powder has been processed to improve the morphology and reduce the oxygen content in order to be processed by Additive Manufacturing.

The feedstock obtained with Fenix Copper is in form of slurry and is optimized for 3D printing by Direct Ink Writing (DIW).
Due to the presence closely spaced fins, this and similar complex geometries can not be easily obtained by machining. The manufacturing flexibility of DIW allows also to explore custom designs, that fits perfectly with each heat management project.



Heat Sink, printed and dried before sintering.

Sintered Heat Sink*

**Not polished or machined, only brushed*

Description of its use

Heat sink are used as passive heat exchanger made, the thermal conductivity of copper is the highest among the materials and can be used to dissipate the heat from a mechanical or electronic device. Beside the high conductivity, Cooper is difficult and more expensive to manufacture into heat sinks in comparison with the aluminium ones. This is why the combination of recycled copper and DIW 3D printing can be the perfect technology to manufacture them.

Main Characteristic Figures

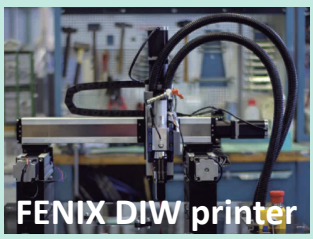
	Value
Recycled Material	100%
Source of Material	PCB
Binder Type	Hydrogel
Printing Time	2 hours
Printing Method	DIW/Robocasting
Toolpath Technique	Concentric lines
Weight Loss	negligible
Shrinkage	5%

Debinding and Sintering

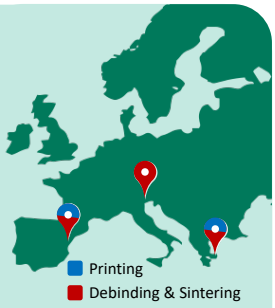
The part dries in air after printing and is ready for the sintering cycle.

Full metal sintering at 1000°C, in inert or reducing atmosphere and supported by alumina sand

The Printer



FENIX DIW printer



The above data represent typical, average values obtained in accordance with accepted test methods. These data, however, as well properties of any product sample do not imply any legally binding assurance or guarantee. We recommend all users to determine the suitability of the products for their intended uses or for a specific purpose. These results have been obtained thanks to the H2020 Innovation Action – FENIX - this project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 760792

More information can be found at : **www.fenix-project.eu** **marketplace.fenix-apps.eu**