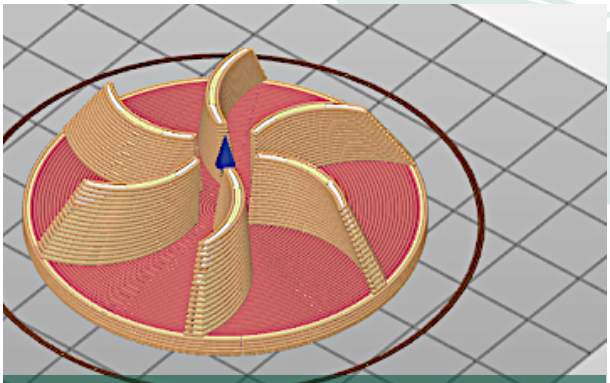
Demonstrator Fact-Sheet
Centrifugal pump rotor with curved fins

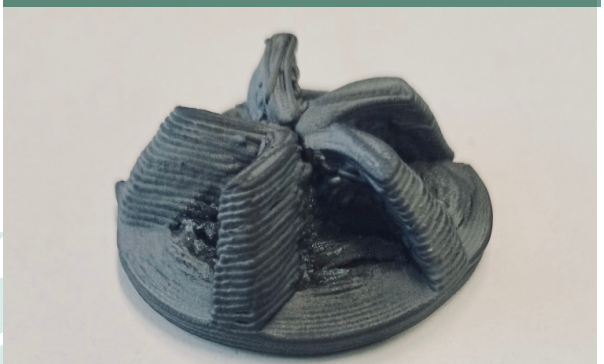
FENIX steel alloy is obtained with Mechanomade® process, using primary metals and ***recycled Copper***.
The Alloy has been developed to have optimal sinter-ability and mechanical properties.

The feedstock obtained with Fenix steel alloy is in form of slurry and it is optimized for 3D printing by Direct Ink Writing (DIW).
This custom design of the rotor allows to evaluate the capabilities of FENIX DIW on different curvatures. With FENIX feedstock for DIW is possible to obtain small overhangs without the need of support material. During the sintering, if supported by alumina sand, the features are retained in the final metal component. This rotor design allows to evaluate the results with curvatures and their repeatability.



STL and ToolPath of the part in FENIX DIW software

Sintered Heat Sink*



**As sintered, without polishing or machining*

Description of its use

The centrifugal rotor is used to increase the pressure and flow of a fluid. The design of the fins in the rotors are designed as a function of the fluid and the needed flow. Manufacturing the rotor in metal makes possible to use the it with hot gases/liquids and in presence of debris.
In a centrifugal pump the rotor is the main component subject to damage and wear, the possibility to have it printed simplify the supply chain and management of spare parts.

Main Characteristic Figures

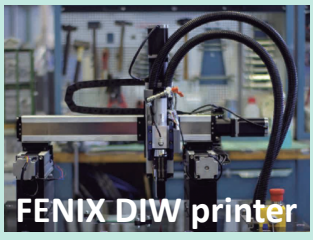
	Value
Recycled Material	100%
Source of Material	PCB
Binder Type	Hydrogel
Printing Time	45 minutes
Printing Method	DIW/Robocasting
Toolpath Technique	Concentric lines
Weight Loss	negligible
Shrinkage	5%

Debinding and Sintering

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

Full metal sintering at 950°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**