Demonstrator Fact-Sheet
Handle knob with lobed shape design

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 a slurry and it is optimized for 3D printing by Direct Ink Writing (DIW).
The size distribution of the particles in the slurry has been optimized to maximise the metal content and at the same time keeping an acceptable flowability for the FENIX DIW printer.
The printer itself has been developed to handle slurries with high viscosity, this has been obtained by using a volumetric extruded driven by a linear motor, able to produced a force up to 1600N.

Sintered Handle*

**As sintered, without polishing or machining*

Description of its use

This custom design of the Handle allows to evaluate the capabilities of FENIX DIW on a complex geometry composed by inner structures, like the handle central stem, and thick bulk parts curvatures. Being in metal, it can be threaded or polished just where needed.
The Handles manufactured as pilot series have a length of 5cm and height of 2,5cm.

Examples of plastic knob handles

Section of the Handle, exploring the metallic part, on the right the printed handle drying

Main Characteristic Figures

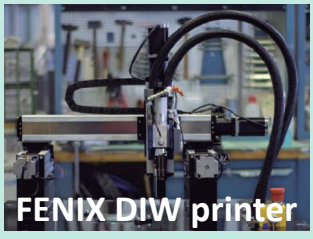
	Value
Recycled Material	20%
Source of Material	PCB
Binder Type	Hydrogel
Printing Time	1 hour
Printing Method	DIW/Robocasting
Toolpath Technique	Concentric lines
Weight Loss	negligible
Shrinkage	5%

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

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