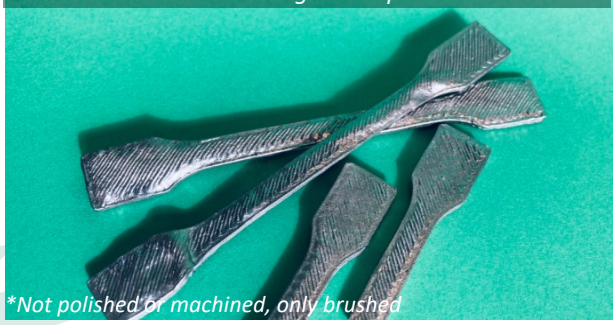
Demonstrator Fact-Sheet
ASTM E8 Test specimens made from powder metallurgy

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

The feedstock contains 82% metal by mass and it is suitable for most Fused Filament Fabrication printers to produce metal objects. Once fired in a sintering furnace, the result is 100% metal.

Sintered Dog-Bone specimens

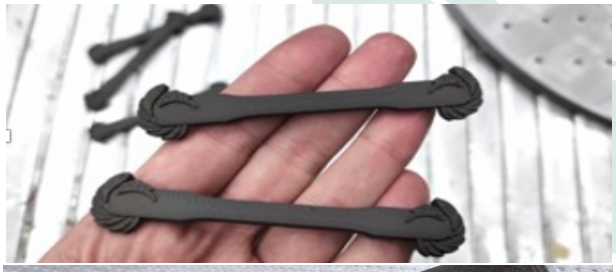


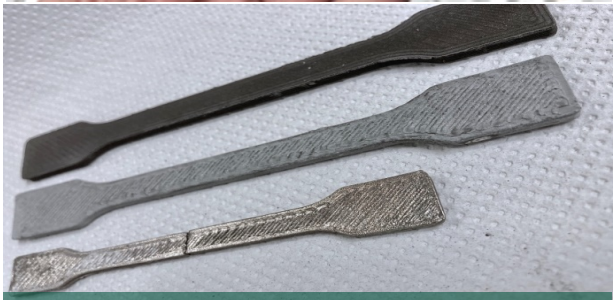
**Not polished or machined, only brushed*

Characteristic Figures

		Value
Archimedean density	g/cm^3	7.5
Porosity*	%	8.4
Sample UTS*	MPa	200
Hardness	HRC	48

*porosity and UTS are determined by the STL geometry and the toolpath strategy





Dog-Bone speciment, printed debinded and sintered.

Description of its use

The specimen has been designed to be compliant with test methods for tension testing of metallic materials at room temperature – ASTM E8, to determination of yield strength, yield point elongation, tensile strength, elongation, and reduction of area.
These mechanical properties are determined by a combination of sintering conditions, printing condition and toolpath, and feedstock properties.
It can be used to benchmark quantitatively the mechanical properties obtained with different materials, or with different printing parameters.

Main Technical Data

	Value
Recycled Material	22%
Source of Material	CPUs
Binder Type	HDPE - PE wax
Printing Time	1 hour
Printing Method	FFF/FDM
Debinding Method	Solvent
Sintering Method	Furnace
Weight Loss	15%
Average Shrinkage	20%

Debinding

Apolar solvent debinding, 1h at 90° or 1day at room temperature

Sintering

Full metal sintering at 950°C, in inert or reducing atmosphere supported by alumina sand

Printers

Tested with:
Raise3D N2 & Pro2
Zortrax M200 & M300
Craftbot Plus PRO
Creality CR10 MAX
Ultimaker 3

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