Demonstrator Fact-Sheet
Mechanical Components – A pulley for transmission belt

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 possibility to obtain mechanical components in metal by additive manufacturing offers a great opportunity to be more agile and resilient: in case of component failure it can manufactured on demand without issuing the supply chain or have parts in stock.
The design utilised for the demonstrator is a mechanical component of the same printer utilised for its manufacturing.

Sintered Pulley spare part

**Not polished or machined, only brushed.*

Characteristic Figures

		Value
Archimedean density	g/cm^3	5.5
Porosity*	%	30%
Hardness	HRC	48

*porosity is determined by the STL geometry and toolpath strategy

Description of its use

A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable or belt. The mechanical stresses goes beyond the capabilities of most plastics, but it is suited for FENIX steel.
The parts can be machined for perfect fit where needed and can be used to substitute broken parts or to test improved gear designs.

Pulley gear, printed, debinded and sintered.

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	17%
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**