filaticum

Dr. Zsolt Bodnar

Composite 3D printing filaments

Filaticum's history

2014 **Idea:** Industry will need 3D printing filaments with specific needs
How: compounding different materials into the PLA polymer matrix

2015 Foundation of Filamania Ltd., brand name Filaticum
First production line
Basic PLA filaments

2020 Industrial PLA composite filaments

The leading industrial filament producer in Hungary

Filamania Ltd. is listed as one of the most 100 innovative companies in Hungary

2022 **Further expansion: Filamania Ltd. is looking for international partners**

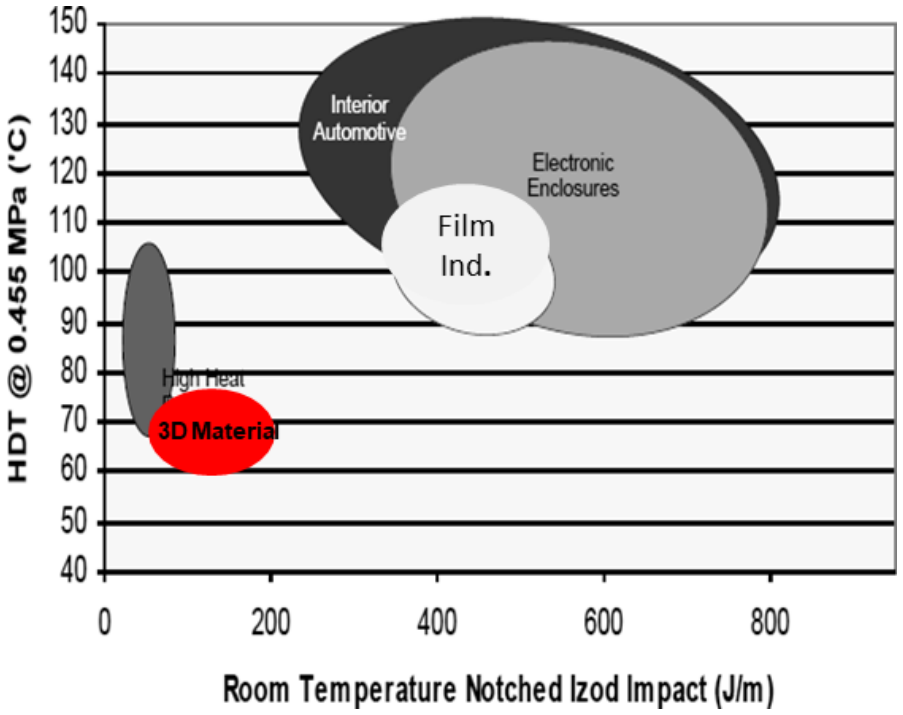
Development of 3D printing

filaticum

2015

Home made
3D printer

Material: PLA, ABS filament



Development of 3D Printing

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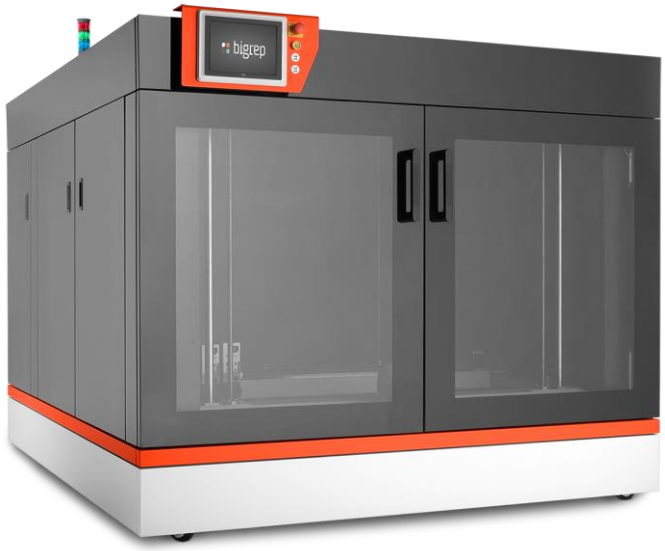
2022

Industrial 3D printer



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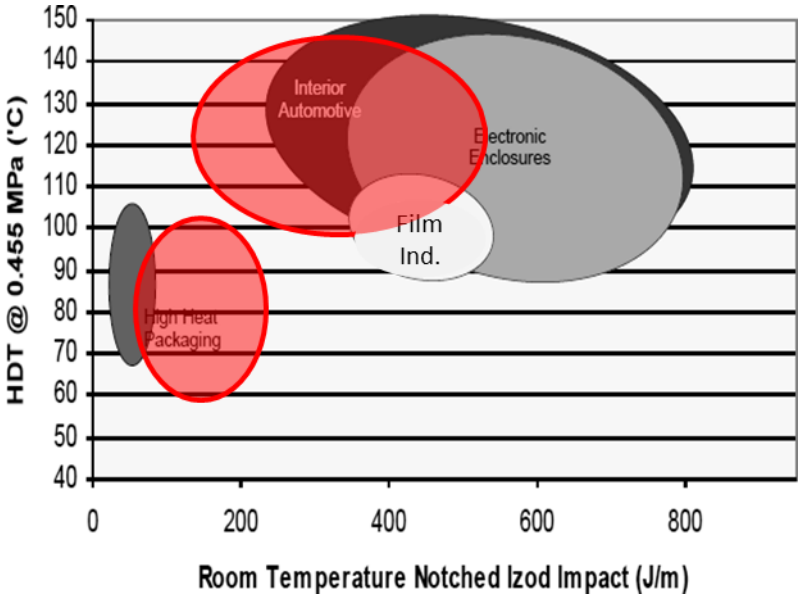
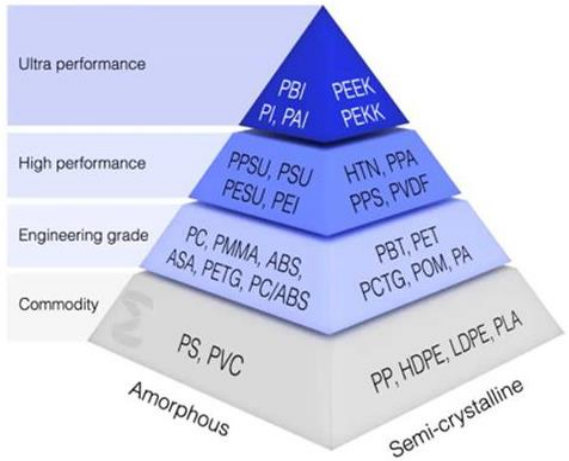
Material: wide range of polymers



Which material can be used for 3D printing?

1. Different polymers



Essentium 2020

Challenges

not easy to print
need for special 3D printer

2. PLA Composite materials

Solutions

printing not any a more problem
endless opportunities
polymer design

FILATICUM COMPOSITE PLA		
ENGINEERING		
Engineering	Heat Resistant	Outdoor / UV resistant
High Impact	Advance Pro	Home Compostable
High Speed	Breakable Support	Flex 65 & 95
MEDICAL	**REINFORCED**	**DENSITY MODIFIED**
Antibacterial	Glass Reinforced	Foam / light
Antiviral	Wood	Gypsum / heavy
MODELLING	**ELECTRICAL**	**WEAR RESYSTANT**
Essence	Antistatic	Tribo
Model	ESD	Glass Reinforced
Gypsum	Conductive	High Speed

Filaticum PLA portfolio

3D printing with PLA filament

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Strengths

- Easy to print
- Environmentally friendly
- Easy to modify

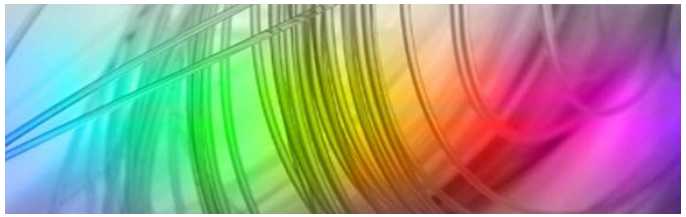
Weaknesses

- Brittleness
- Low softening temperature, ca. 60 °C
- Low impact strength
- No thermal and electrical conductivity

Filaticum's solution: development of unique composite materials, based on PLA' strengths, elimination of its weaknesses

Filaticum products

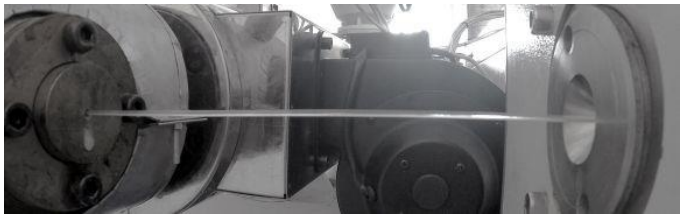
Filaticum Basic



Entry level materials

- Basic polymer
- Variety of colors

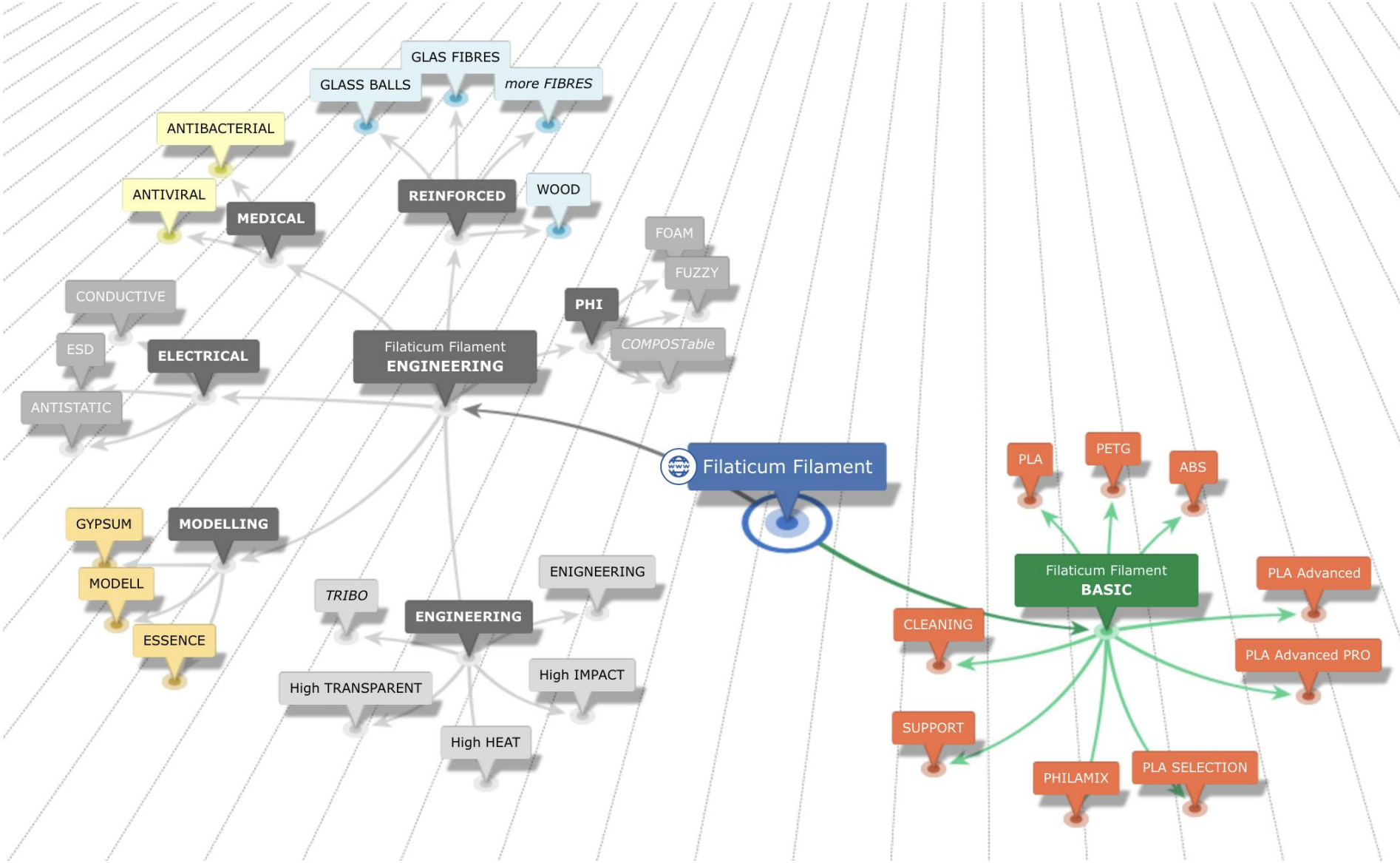
Filaticum Technical



Materials for industrial usage

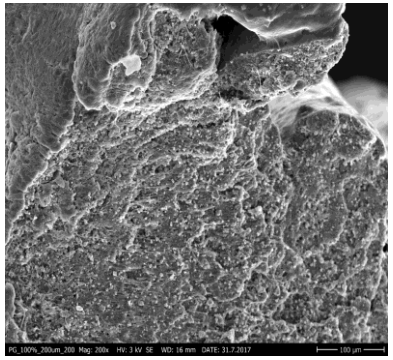
- Composite polymers
- Different mechanical, thermal, chemical behaviours

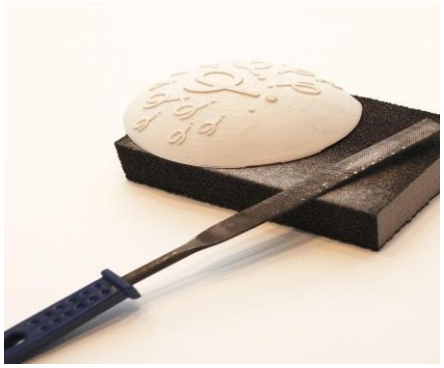
Filaticum portfolio



Filaticum Model & Gypsum

- Like „gypsum”
- Easy postprocessing
- Sandable wet and dry
- It can be cut with sharp tool
- Paintable, even with water based paint
- Matt printing surface





Model & gypsum in film industry

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Requirements

- Easy to print even at high speed to prepare big objects
- Post processing with dry and wet sanding
- Matt surface
- Easy to paint, even with water based paint

Solution:

Essence	**5 % gypsum**
Model	**20 % gypsum**
Gypsum	**50 % gypsum**

Filaticum Foam

Even 50 % mass reduction can be reached

- Open cell structure, hard foam
- Structure of the foam, quality and structure of the surface can be modified in many ways
- Smooth, matt surface, the layers are barely visible

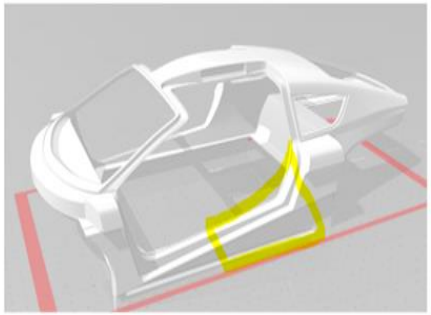
Printed by BigRep

Foam for car body structure

filaticum

Requirements

- Light-weight
- Large volume
- High speed printing



Nyomtatás: BigRep ONE

Filaticum Electrical

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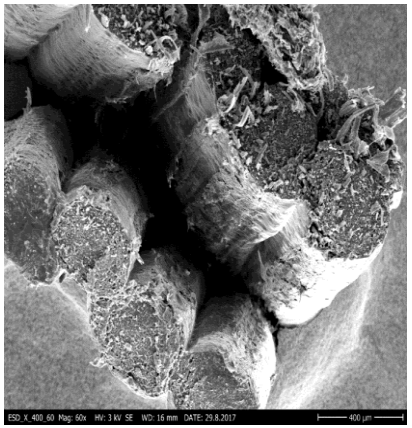
Antistatic
ESD
Conductive

Surface Resistivity, ohms/sq		
	10^{15}	INSULATOR
	10^{14}	
	10^{13}	FILATICUM ANTISTATIC
	10^{12}	
	10^{11}	
	10^{10}	
	10^{9}	FILATICUM ESD
	10^{8}	
	10^{7}	
	10^{6}	
	10^{5}	FILATICUM CONDUCTIVE
	10^{4}	
	10^{3}	

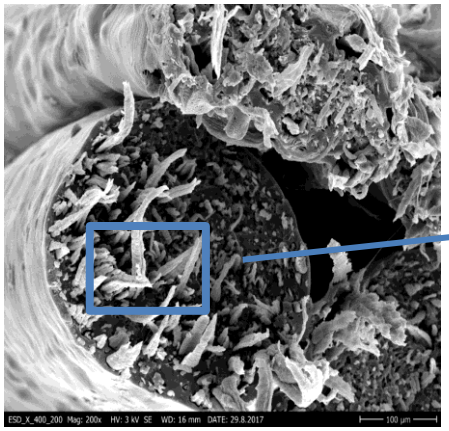
Filaticum Electrical: ESD

PLA mixed with carbon powder and carbon fiber

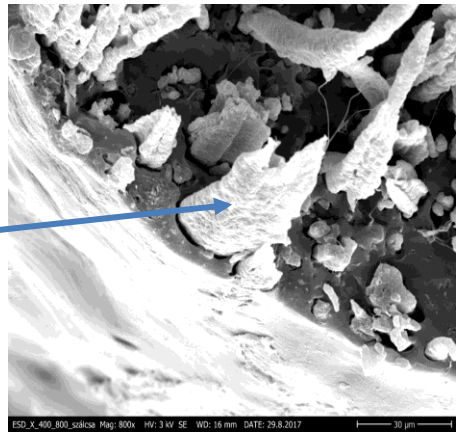
SEM picture



60x magnification



200x magnification



800x magnification

Carbon powder,
10-80 mikron size
carbon fiber

Filaticum electrical in industry

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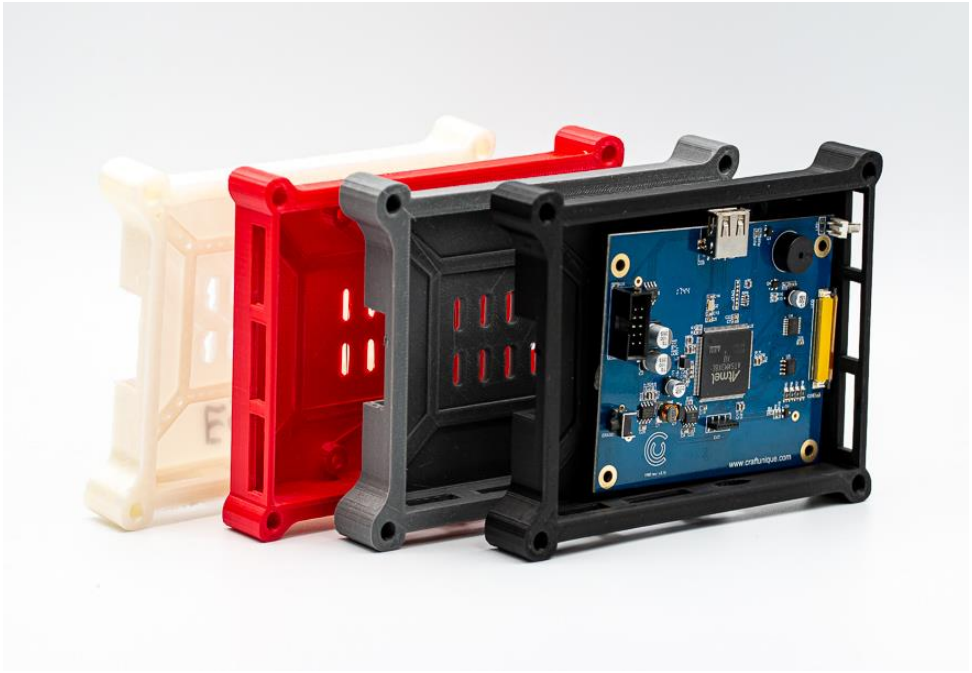
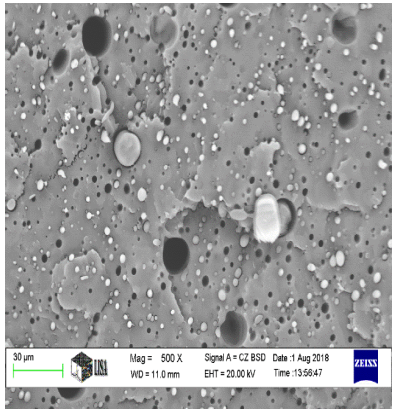
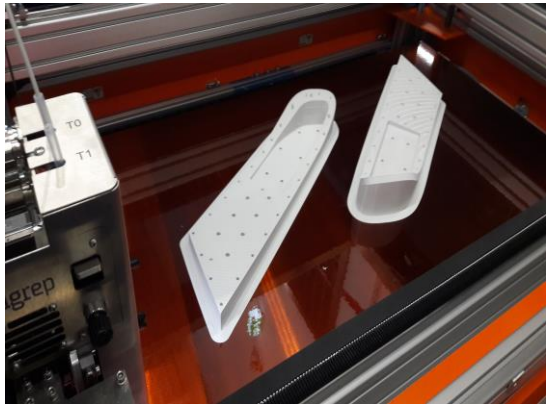
	Surface Resistivity	Mechanical Properties	Colorability
ANTISTATIC	+	++++	++++
ESD	++	++	-
CONDUCTIVE	+++	+	-

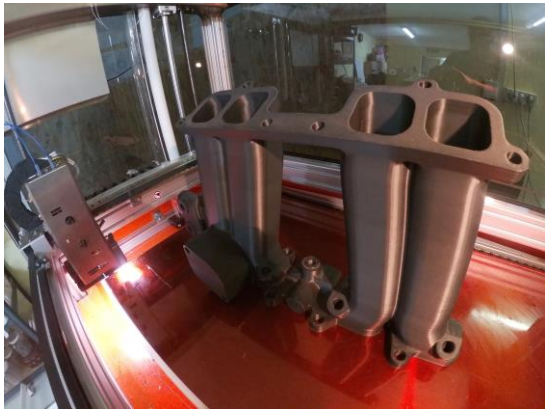


Filaticum Engineering

- Increased impact strength
- Heat resistance even at 120-140 ºC
- Wear resistant, durable
- Matt surface







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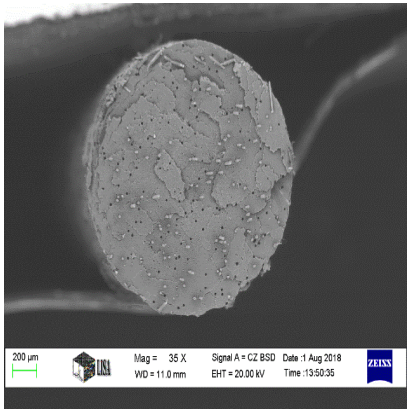
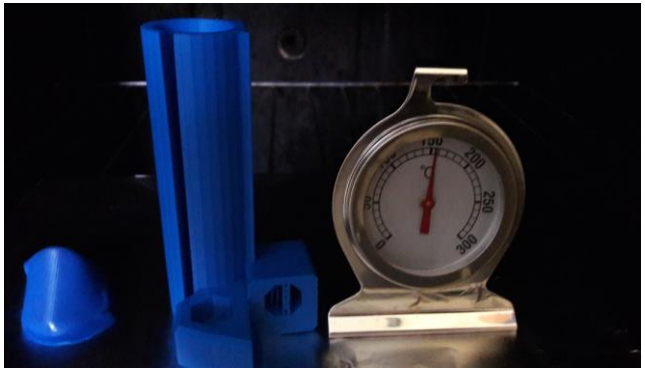
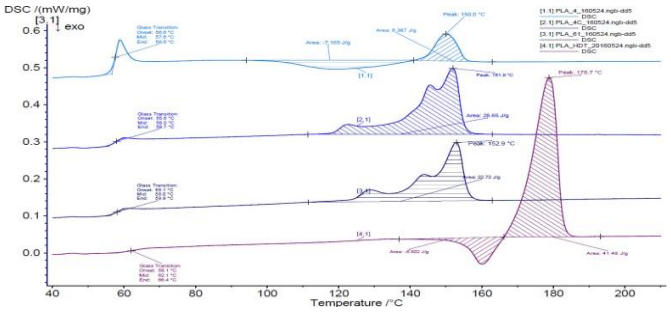


Filaticum Engineering

Heat resistance without annealing: 120-140 ºC





Filaticum Engineering in automotive industry

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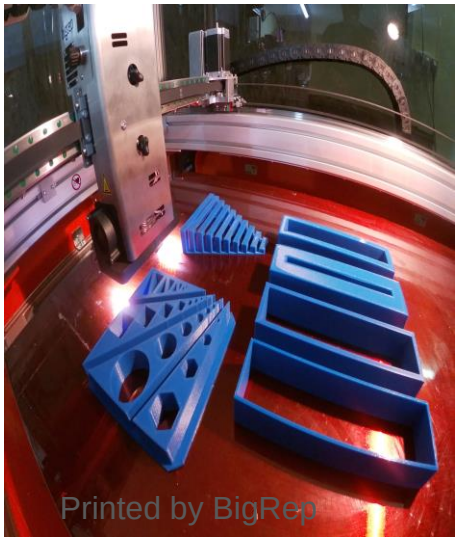
Requirements

- High temperature tolerance
- High impact
- Durable
- High stiffness
- Low warping



Filaticum Medical
Antiviral, Antibacterial

Due to the applied silver ion technology it could be more effective in protection against viruses.

It has been tested to be effective against e.g. Feline Coronavirus, H1N1, Norovirus and SARS- CoV-2 virus.

Frame of mask used to protect against Covid

Respirator walves

Printed by BigRep

Filaticum medical for orthesis

Requirements

- High impact
- Antibacterial
- Semi rigid, Shore A 95
- Easy to print

3D Polymer Design

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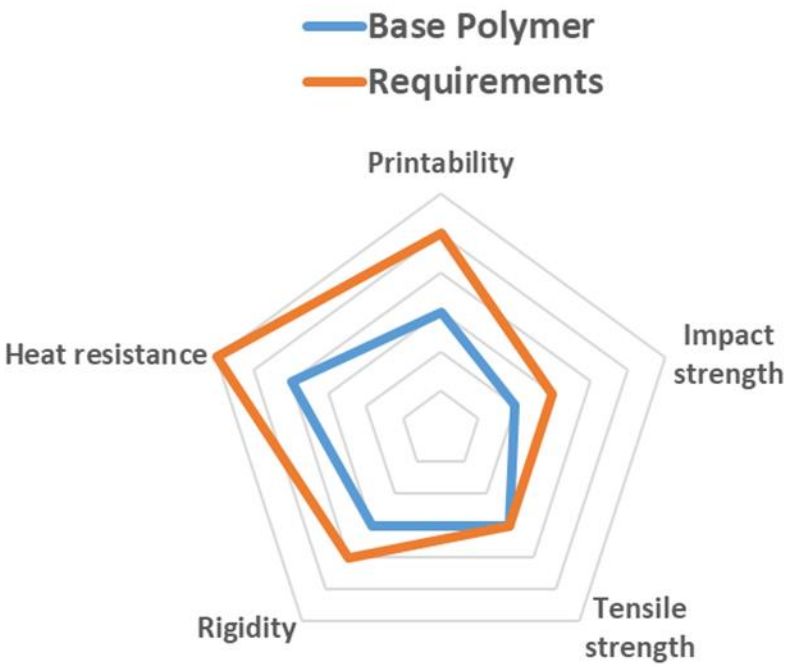
We are able to create industrial 3D filament for a wide range of application

- Technical Requirements
- Database
- CREATING A NEW 3D FILAMENT
- 3D printing test
- Test in industry



Filaticum - PLA composite filaments for industry

Filaticum looking for a partner for international growth

www.filaticum.com

Thank you!