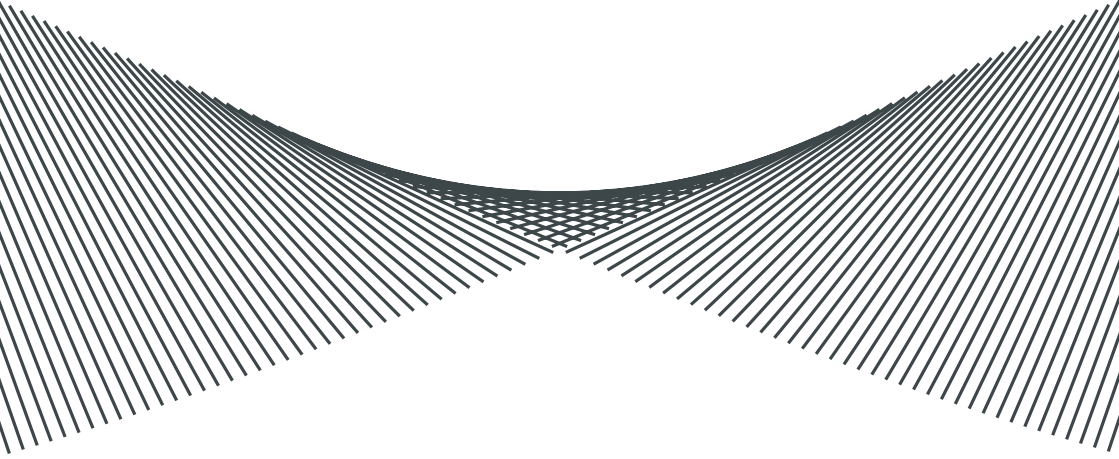




**extrudr**

PRODUCT CATALOG





## Our Materials

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BIO →

← INDUSTRIAL

Data Overview

# Material Table

MATERIAL	NOZZLE [°C]	HEATBED [°C]	SPEED (MM/S)	DRYING TEMPERATURE [°C]	DRYING TIME (H)	ENCLOSED SPACE	HARDENED NOZZLE	SOLUBLE WITH STANDARD SOLVENTS	FDA COMPLIANT	HEAT RESISTANCE VICAT A [VST] [°C]
<b>PLA NX2 MATT</b>	200-230	20-60	20 - 200	60	0-6	no	no	Toluol, EDC, THF, Cloroform	yes	55
<b>PLA BASIC</b>	200-230	20-60	20 - 200	60	0-6	no	no	Toluol, EDC, THF, Cloroform	yes	60
<b>BIOFUSION</b>	200-230	20-60	20 - 40	60	6	no	no	Toluol, EDC, THF, Cloroform	yes	75
<b>GREENTEC</b>	200-230	20-90	20 - 200	60	4	no	no	Toluol, EDC, THF, Cloroform	yes	115
<b>GREENTEC PRO</b>	210-230	20-90	20 - 200	60	4	no	no	Toluol, EDC, THF, Cloroform	yes	160
<b>GREENTEC PRO CF</b>	225-250	20-90	20 - 200	60	4	no	yes	Toluol, EDC, THF, Cloroform	no	165
<b>FLAX</b>	180-240	20-60	20 - 200	50	4	no	no	Toluol, EDC, THF, Cloroform	yes	48
<b>PEARL</b>	140-210	20-60	20 - 200	50	4	no	no	not specified	yes	58
<b>WOOD</b>	170-190	20-60	20 - 40	50	4	no	no	not specified	yes	48
<b>PCTG</b>	230-270	90-110	20 - 200	60	4-6	for larger components	no	not specified	yes	88
<b>PETG</b>	210-230	60-90	20 - 200	60	4-6	for larger components	no	DCM	yes	78
<b>XPETG MATT</b>	210-240	60-90	20 - 200	60	6	for larger components	no	not specified	yes	85
<b>XPETG CF</b>	220-250	60-90	20 - 200	60	6	for larger components	ja	DCM	no	85
<b>DURAPRO ABS</b>	220-250	100-110	20 - 200	60	10	yes	no	not specified	yes	92
<b>DURAPRO ASA</b>	220-270	100-110	20 - 200	60	10	yes	no	Aceton	yes	96
<b>DURAPRO ASA CF</b>	240-260	110	20 - 200	60	10	yes	ja	not specified	no	101
<b>DURAPRO ASA GF</b>	240-280	110	180	60-80	8-12	yes	ja	not specified	no	101
<b>DURAPRO PA12</b>	260-290	110	150	60-80	8-12	yes	no	Cloroform	no	142
<b>DURAPRO PA12 CF</b>	260-290	110	150	60-80	8-12	yes	ja	not specified	no	145
<b>DURAPRO PC/PBT</b>	260-290	110	280	60-80	8-12	yes	no	not specified	no	126
<b>DURAPRO PC/PBT CF</b>	265-295	110	250	60-80	8-12	yes	ja	not specified	no	142
<b>FLEX SEMISOFT</b>	220-250	50-90	20 - 100	60	12	no	no	Chloroform, DCM	no	98
<b>FLEX MEDIUM</b>	230-250	50-90	20 - 100	60	12	no	no	Chloroform, DCM	yes	110
<b>FLEX MEDIUM ESD</b>	220-250	50	50	60	6	no	no	not specified	yes	not specified
<b>FLEX HARD</b>	230-260	50-90	20 - 100	60	12	no	no	Chloroform, DCM	no	140
<b>FLEX HARD CF</b>	230-260	50-90	20 - 100	60	6	no	w	not specified	no	140

BIO →

← INDUSTRIAL



## RAL Color System

# Variety of Colors

### RAL COLORS

- Standardized colors
- Efficiency
- Quality assurance
- Available in any RAL color upon request

### SPECIAL MATERIALS

- Wood
- Carbon
- Transparent

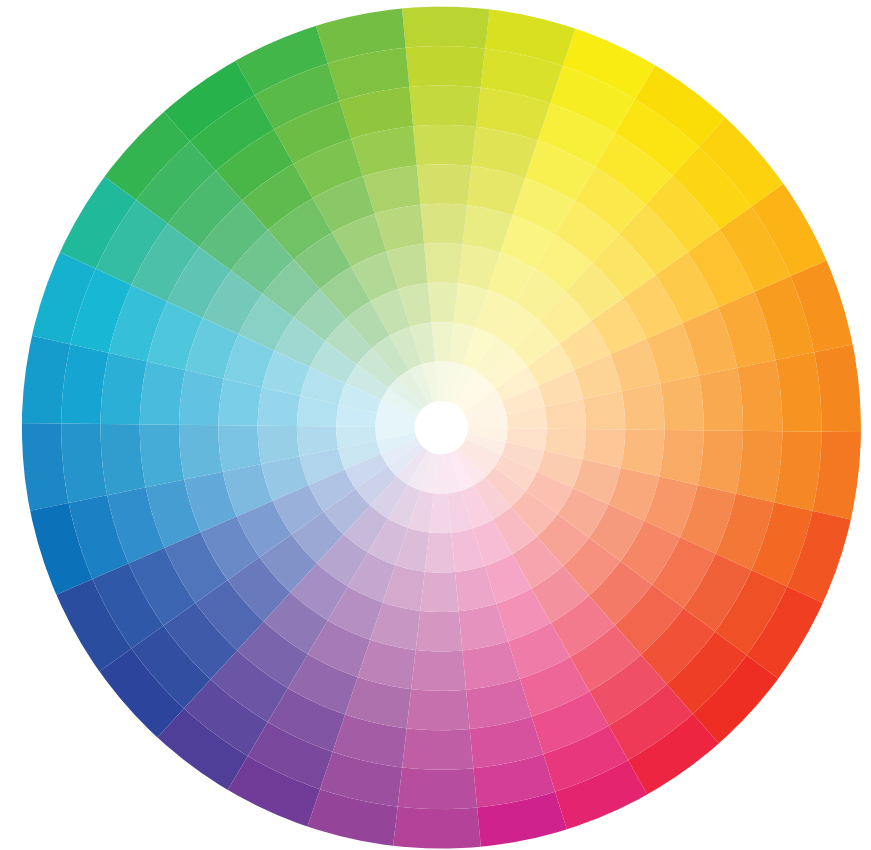
### PROPERTIES

- Matte
- Transparent
- Shiny
- Natural fiber
- Glow

### CUSTOMIZED SOLUTION

Our extensive selection of materials is complemented by the ability to produce exclusive custom colors upon request. We provide experienced professionals to ensure that your specific color visions are perfectly executed.

Let us bring color to your project together and elevate your endeavor to the next level - with our wide range of colors and the possibility to realize customized custom colors. We are here to meet your individual needs.



### **i** CUSTOM COLORS UPON REQUEST

We offer a wide range of materials and also realize your custom colors upon request. Unleash your creativity and bring your individual color ideas to life.

[SALES@EXTRUDR.COM](mailto:SALES@EXTRUDR.COM)

## FEATURES

- Matte surface
- Mechanically loadable
- CO<sub>2</sub> neutral
- Good tensile strength
- Improved UV resistance
- Complies with FDA, RoHS and Safety of Toys regulations

## DESCRIPTION

PLA NX2 MATT & TOUGH is a new generation of PLA with improved mechanical properties compared to normal PLA. The optimised interface offers detailed

print quality. It is also suitable for mechanically stressed parts due to its impact resistance and higher flexibility.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Flexural modulus (E-Modulus)	ISO 178	MPa	2650
Tensile modulus (E-Modulus)	ISO 527	MPa	2600
Tensile strength	ISO 527	MPa	47
Elongation at strength	ISO 527	%	4
Stress at break	ISO 527	MPa	23
Nominal elongation at break	ISO 527-2	%	19
Notched impact strength	ISO 179/1eA	kJ/m <sup>2</sup>	7
Unnotched impact strength	ISO 179/1eU	kJ/m <sup>2</sup>	no break
VICAT A (VST)	ISO 306	°C	60*
Melting temperature	ISO 3146-C	°C	180-200
MFR	ISO 1133	g/10min	5
Shrinking	ISO 294-4	%	0.3
Density	ISO 1183	g/cm <sup>3</sup>	1.3

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

PRINT SETTINGS	
Nozzle	200 - 230°C
Heatbed	20 - 60°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	30% - 100%
Enclosed space	no
Hardened nozzle	no
Max. Volumetric Speed	21 mm <sup>3</sup> /s

Recommended settings for printers with a 0,4mm nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE



© alpen-werk | www.alpen-werk.de

### Mountains to touch

"Mountains to touch" is what the German company @alpen.werk offers, bringing a piece of landscape into your own four walls.

- High details due to low warping
- Matte surface



*"Consistent quality is important to me, and the matte finish of the Extruder PLA NX2 is perfect for the reliefs."*

Stephan Wittmann  
alpen-werk



## CERTIFICATIONS & ADDITIONAL INFORMATION



## FEATURES

- Excellent price-performance ratio
- Wide range of colours
- Easy to process
- Very high print quality
- Made from renewable raw materials
- Biodegradable [EN 13432]

## DESCRIPTION

PLA is a bio-based material and is one of the most commonly used polymer for 3D printing. It is ideal for a wide range of applications, including prototyping, architecture, modelling and DIY projects. The raw material is approved according to REACH, RoHS and

FDA standards. Due to its low melting temperature, PLA Basic is very easy to print and enables the production of impressive end products with a glossy surface. High-speed printing up to 350 mm/s is possible with the material.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Tensile modulus (E-Modulus)	ASTM D882	MPa	500 (3.5)	Nozzle 200 - 230°C
Tensile strength	ASTM D882	MPa	53	Heatbed 20 - 60°C
Stress at break	ASTM D882	MPa	60	Adhesive not required
Nominal elongation at break	ASTM D882	%	6	Speed 20 - 200 mm/s
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	0,3	Cooling 30% - 100%
VICAT A (VST)	ASTM E2092	°C	55*	Enclosed space no
Melting temperature	ISO 3146-C	°C	180-200	Hardened nozzle no
MFR	ASTM D1238	g/10min	6	Max. Volumetric Speed 21 mm <sup>3</sup> /s
Shrinking	ASTM D955	%	0,4	
Density	ASTM D792	g/cm <sup>3</sup>	1.24	

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

Recommended settings for printers with a 0.4mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE



### Ein Prototyp fürs All

© TU Wien Space Team | www.spaceteam.at

PLA Basic is ideal for creating prototypes due to its ease of printing. The prototype for the largest fired liquid rocket engine in Austria was printed using PLA

Basic by the TU Wien Space Team. The rocket itself is expected to reach speeds of up to 5500 km/h.

- Easy to print, making it suitable for beginners

- Detailed print quality

- Bio-based



### Multicolor 3D printing for models

PLA Basic is available in many different colors, making it suitable for multicolor 3D printing.



**FEATURES**

- Unique metallic look**
- Low warping**
- Good impact resistance**
- Recyclable**

**DESCRIPTION**

BioFusion is a new generation of special bio-based materials, developed for designers and makers. The filament is very easy to process, which means that extraordinary results can be achieved even with

little experience. The printed parts have an intense, metallic gloss. BioFusion has a temperature resistance of up to 75°C.

**PROPERTIES**

TEST	METHOD	UNIT	VALUE
Tensile modulus (E-Modulus)	ASTM D882	MPa	3200
Tensile strength	ASTM D882	MPa	55
Breaking stress	ASTM D882	%	5
Elongation at break	ISO 527	MPa	41
E-Modulus	ISO 178	MPa	2200
Impact resistance	ASTM D256	kJ/m <sup>2</sup>	12 J/m
MFR	ASTM D1238	g/10min	7
Melting temperature	ISO 3146-C	°C	200-210
VICAT A (VST)	ASTM D1525	°C	75*
Shrinking	ASTM D955	%	0.3
Density	ASTM D792	g/cm <sup>3</sup>	1.25

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

PRINT SETTINGS	
Nozzle	200 - 230°C
Heatbed	20 - 60°C
Adhesive	not required
Speed	20 - 40 mm/s
Cooling	10% - 30%
Enclosed space	no
Hardened nozzle	no
Max. Volumetric Speed	6 mm <sup>3</sup> /s

Recommended settings for printers with a 0.4mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

**SHOWCASE**
**Metallic look**

BioFusion impresses with its glossy appearance and unique colors. Optical masterpieces can be printed from it.

- Unique metallic, glossy look**
- Vivid colors**
- Easy to process**



**FEATURES**

- 100% sustainable and oil-free
- Matte look
- CO<sub>2</sub> neutral
- Biodegradable (DIN EN ISO 14855)
- Heat distortion resistance up to 115°C VICAT A

**DESCRIPTION**

GreenTEC comes from our BIO Performance range and has been specially developed for high-performance applications. The material has a heat distortion resistance of 115°C (VST) and is optimised for high impact resistance. It offers a high-quality matte look.

GreenTEC is the ecologically harmless alternative to commonly used industrial materials, consisting of 100% renewable raw materials and biodegradable according to DIN EN ISO 14855. In addition, the raw material has food approval (FDA).

**PROPERTIES**

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Tensile modulus (E-Modulus)	ISO 527	MPa	3200	Nozzle 200 - 230°C
Tensile strength	ISO 527	MPa	46	Heatbed 20 - 90°C
Elongation at strength	ISO 527	%	3	Adhesive not required
Stress at break	ISO 527	MPa	18	Speed 20 - 200 mm/s
Nominal elongation at break	ISO 527-2	%	14	Cooling 30% - 80%
Notched impact strength	ISO 179/1eA	kJ/m2	19	Enclosed space no
Unnotched impact strength	ISO 179/1eU	kJ/m2	218	Hardened nozzle no
VICAT A (VST)	ISO 3146-C	°C	115*	Max. Volumetric Speed 16 mm <sup>3</sup> /s
Melting temperature	ISO 1133	°C	180-200	
MFR	ISO 75	g/10min	8	
Shrinking	ISO 294-4	%	0.5	
Density	ISO 1183	g/cm <sup>3</sup>	1.3	

Recommended settings for printers with a 0.4mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

**SHOWCASE**


© 4frames | www.4-frames.de

**Aerodynamic tools  
Triathlon bike**

For optimal utilization of power and speed, custom-fit andaerodynamic attachments for the "4frames" bike have been developed. These components were manufactured using GreenTEC. It was important for the team to use a material made from 100% renewable resources with a matte finish. The attachments provide space for bicycle spare parts, necessary tools, or an energy bar.

- Precision-fit
- Individually tailored to the frame
- Lightweight and aerodynamic





# GREENTEC PRO

## FEATURES

- 100% sustainable and oil-free
- Semi-matte look
- Biodegradable [DIN EN ISO 14855]
- Heat distortion resistance up to 160°C VICAT A / 115°C HDT/B\*
- Impact strength

## DESCRIPTION

GreenTEC Pro comes from our BIO Performance range and has been specially developed for ultra-high-performance applications. The material has a heat distortion resistance of 160°C (VST A - 4mm wall thickness) and is optimised for high rigidity and flexural strength. The material offers a high-quality

semi-matte look. GreenTEC Pro is the ecologically harmless alternative to commonly used industrial materials, consisting of 100% renewable raw materials and biodegradable according to DIN EN ISO 14855. In addition, the raw material has food approval (FDA).

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Tensile modulus (E-Modulus)	ISO 527	MPa	4300
Tensile strength	ISO 527	MPa	58
Elongation at strenght	ISO 527	%	2.8
Stress at break	ISO 527	MPa	53
Notched impact strength	ISO 179/1eA	kJ/m2	4
Unnotched impact strength	ISO 179/1eU	kJ/m2	71
VICAT A (VST)	ISO 306	o°CC	160*
Melting temperature	ISO 3146-C	°C	180-200
MFR	ISO 1133	g/10min	9
HDT/B	ISO 75	°C	115*
Shrinking	ISO 294-4	%	0.4
Density	ISO 118	g/cm³	1.35

PRINT SETTINGS	
Nozzle	210 - 230°C
Heatbed	20 - 90°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	30% - 80%
Enclosed space	no
Hardened nozzle	no
Max. Volumetric Speed	16 mm³/s

Recommended settings for printers with a 0.4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Orthodontic models

© Dr. med. dent. Jörg Schwarze | www.kieferorthopaedie-koeln.de

The filament is versatile and meets the high requirements for manufacturing orthodontic models in the dental industry. With its easy handling, it provides a cost-effective and time-saving alternative to plaster and resin models. GreenTEC Pro is "ready to use" without additional post-processing. Perfect for optimized workflows. Dr. Schwarze and numerous industry colleagues trust GreenTEC Pro.

- Food-safe and FDA compliant
- Solvent-free and odorless
- Dimensional stability for thermoforming
- Ideal material for aligners, working, and diagnostic models



BIO



## CERTIFICATIONS & ADDITIONAL INFORMATION



FDA compliant



RoHS compliant



REACH compliant



FREE of Silicone



DEGRADABLE ISO 14885



# GREENTEC PRO CF

## FEATURES

- Carbon composite material for performance applications
- Heat resistance up to 165°C VI-CAT A / 115°C HDT/B
- 100% sustainable and oil-free
- CO<sub>2</sub> neutral
- Easy to process

## DESCRIPTION

GreenTEC Pro Carbon comes from our BIO Performance range and has been specially developed for ultra-high-performance applications. The composite material contains 10% carbon fibre, resulting in increased rigidity and heat distortion resistance. The material offers a high-quality

carbon look. GreenTEC Pro Carbon is the ecologically harmless alternative to common industrial materials, consisting of renewable raw materials. In addition, the raw material is approved according to REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Tensile modulus (E-Modulus)	ISO 527	MPa	7120	Nozzle 225 - 250°C
Tensile strength	ISO 527	MPa	65	Heatbed 20 - 90°C
Elongation at strength	ISO 527	%	3	Adhesive not required
Stress at break	ISO 527	MPa	58	Speed 20 - 200 mm/s
Nominal elongation at break	ISO 527-2	%	2.5	Cooling 20% - 50%
Notched impact strength	ISO 179/1eA	kJ/m <sup>2</sup>	4.6	Enclosed space no
Unnotched impact strength	ISO 179/1eU	kJ/m <sup>2</sup>	82	Hardened nozzle yes
VICAT A (VST)	ISO 306	°C	165*	Max. Volumetric Speed 18 mm <sup>3</sup> /s
Melting temperature	ISO 3146-C	°C	180-200	
MFR	ISO 1133	g/10min	4	
HDT/B	ISO 75	°C	115	
Shrinking	ISO 294-4	%	0.2	
Density	ISO 1183	g/cm <sup>3</sup>	1.2	

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



© Campus Tirol Motorsport | www.ct-motorsport.at

### Components of the Formula Student teams

Formula Student teams' collaboration partners rely on the performance of composite materials when building race cars: Numerous components such as the steering wheel, spoiler, and battery mounting fixtures were realized using GreenTEC Pro Carbon.

### Drone

- Frame 3D printed with GreenTEC Pro CF
- Top speed up to 300 km/h
- 3D printing enables lightweight construction
- No vibrations thanks to high stiffness



© www.vonoben.tv

## CERTIFICATIONS & ADDITIONAL INFORMATION



RoHS compliant



REACH compliant



FREE of Silicone



DEGRADABLE ISO 14885

## FEATURES

- Very good printing and flow properties
- Mineral-like surface
- Low warping
- Biodegradable [DIN EN ISO 14855]

## DESCRIPTION

FLAX comes from our BIO design range and is made from renewable raw materials. Thanks to the added mineral filler, fast production speed is possible. The material has been developed for rapid prototyping applications.

At high temperatures and uniform printing speed, the surface becomes rough and resembles sandstone. The raw material is approved according to REACH, RoHS and FDA standards.

## PROPERTIES

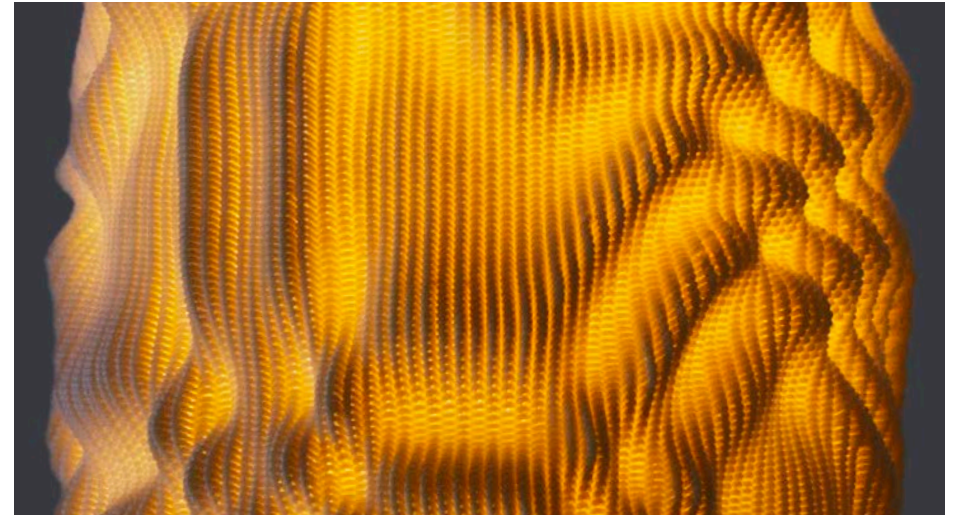
TEST	METHOD	UNIT	VALUE
Flexural modulus	ISO 527	MPa	3400
Tensile strength	ISO 527	MPa	43
Breaking stress	ISO 527	%	3
Elongation at break	ISO 527	%	22.3
Flexural strength	ISO 527	MPa	30
MFR	ISO 1133	g/10min	15
VICAT A (VST)	ISO 306	°C	48*
Density	ISO 2781	g/cm <sup>3</sup>	1.45

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

PRINT SETTINGS	
Nozzle	180 - 240°C
Heatbed	20 - 60°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	30% - 100%
Enclosed space	no
Hardened nozzle	no

Recommended settings for printers with a 0.4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE



### Exceptional aesthetics for interior design

© Drag & Drop Design | www.draganddrop.design

3D printing technology enables a variety of design expression possibilities. This is evident in the lamp designed by Drag and Drop Design brought to life in an impressive way with FLAX. At high temperatures and normal speeds, a rough, sandstone-like appearance is created, conveying a beautiful natural look.

Additionally, the material can also be used at high manufacturing speeds, making it suitable for rapid prototyping.

- Rough, sandstone-like appearance
- Natural look
- High manufacturing speeds possible



**FEATURES**

- Very good printing and flow properties**
- Unique pearl look**
- Low warping**
- Biodegradable [DIN EN ISO 14855]**

**DESCRIPTION**

PEARL comes from our BIO design range and impresses with its uniquely supple surface. The material consists of 100% renewable raw materials.

The raw material is approved according to REACH, RoHS and FDA standards.

**PROPERTIES**

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Flexural modulus	ISO 527	MPa	2500	Nozzle 140 - 210°C
Tensile strength	ISO 527	MPa	34	Heatbed 20 - 60°C
Breaking stress	ISO 527	%	3	Adhesive not required
Elongation at break	ISO 527	%	6.9	Speed 20 - 200 mm/s
E-Modulus	ISO 178	MPa	1800	Cooling 30% - 100%
Flexural strength	ISO 527	MPa	30.1	Enclosed space no
MFR	ISO 1133	g/10min	4	Hardened nozzle no
VICAT A (VST)	ISO 306	°C	58*	
HDT/B	ISO 75	°C	51	
Shrinking	ISO 294-4	%	0.67	
Density	ISO 2781	g/cm <sup>3</sup>	1.25	

Recommended settings for printers with a 0.4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

**SHOWCASE**

**Lamps made from biomaterials**

3D printing meets sustainability: Tagwerk designs innovative lighting and decoration ideas, which are transformed into physical objects using 3D printers.


**High-quality biomaterial**

- With a smooth, glossy surface.

**Translucent effect**

- PEARL has a particularly beautiful translucent effect and distributes the light optimally throughout the lampshade.

**Modern design**

- With 3D printing, numerous interesting 3D structures can be created.


**CERTIFICATIONS & ADDITIONAL INFORMATION**


## FEATURES

- Good printing and flow properties
- Wood-like smell and aesthetics
- Low warping
- Biodegradable [DIN EN ISO 14855]

## DESCRIPTION

WOOD comes from our BIO design range and consists of renewable raw materials such as lignin and other biopolymers. This wood-fibre-reinforced

plastic is characterised by exceptional processing properties. In addition, the raw material is approved according to REACH, RoHS and FDA standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Flexural modulus	ISO 527	MPa	3200	Nozzle 170 - 190°C
Tensile strength	ISO 527	MPa	40	Heatbed 20 - 60°C
Breaking stress	ISO 527	%	2	Adhesive not required
Flexural strength	ISO 527	MPa	43	Speed 40 - 60 mm/s
MFR	ISO 1133	g/10min	22	Cooling 50% - 80%
VICAT A (VST)	ISO 306	°C	48*	Enclosed space no
Density	ISO 2781	g/cm <sup>3</sup>	1.23	Hardened nozzle no

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

Recommended settings for printers with a 0.5mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE



### Wood-like appearance & texture

The spruce fiber components of the WOOD filament create a unique natural appearance and wood-like feel. Filaments with fiber components are printed with a nozzle diameter of at least 0.5 mm.

- Biological spruce fibers
- Wood-like texture
- 100% made from renewable resources



FEATURES

- Good mechanical properties
- Excellent transparency
- High chemical resistance
- Clear colours
- Fire retardant according to UL94 V2

DESCRIPTION

PCTG is a modified copolyester for the highest industrial requirements. The material combines high chemical and thermal resistance with mechanical properties, such as high impact resistance,

scratch resistance and excellent optical brilliance. In addition, it meets numerous certifications (cosmetics approval, FDA, REACH, RoHS).

PROPERTIES

TEST	METHOD	UNIT	VALUE
Flexural modulus (E-Modulus)	ISO 178	MPa	1650
Flexural strength	ISO 178	MPa	62
Tensile strength at yield	ISO 527	MPa	43
Tensile strength at break	ISO 527	MPa	45
Elongation at yield	ISO 527	%	4,3
Elongation at break	ISO 527	%	215
Notched impact strength	ISO 180	kJ/m <sup>2</sup>	94 @ 23 °C
HDT/B	ISO 75	°C	76
VICAT (VST)	ASTM D1525	°C	88
Shrinking	ASTM D955	%	0,2 - 0,5
Density	ASTM D792	-	1,21
Rockwell Hardness	ASTM D785	R-Skala	105
Flammability	UL 94	V-2	3,2 mm
Flammability	UL 94	HB	1,5 mm

PRINT SETTINGS	
Nozzle	230 - 270°C
Heatbed	90 - 110°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	20% - 50%
Enclosed space	for larger components
Hardened nozzle	no
Max. Volumetric Speed	9 mm <sup>3</sup> /s

Recommended settings for printers with a 0.4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.



Buckle - two parts, a solid closure

PCTG withstands the movements of opening and closing the buckle effortlessly. Thanks to its impact resistance, the material is more resistant to breaks and deformations.

- Impact resistance
  - Resistant to impacts and blows
  - High fracture toughness
- Good printability
  - No warping
  - Excellent adhesion to the print bed
- High strength at break



INDUSTRIAL



## FEATURES

- Good mechanical properties**
- Low shrinking**
- High chemical resistance**
- Recyclable**
- Low warping**
- Low-shrinking technology**

## DESCRIPTION

Polyethylene terephthalate glycol (PETG) is one of the world's best-known thermoplastic polymers. Extrudr PETG has been developed for a wide range of applications where the main requirement is a good balance between mechanical and optical material

properties. The low-shrinking technology ensures that the material can be processed in an energy-saving manner at low temperatures and thus with relatively little distortion. The raw material is certified according to FDA, REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Flexural modulus (E-Modulus)	ISO 178	MPa	2100
Flexural strength	ISO 178	MPa	68
Tensile modulus (E-Modulus)	ISO 527	MPa	3100
Yield stress	ISO 527	MPa	51
Elongation at yield	ISO 527-2	%	4
Strength	ISO 527	MPa	61
Elongation at strength	ISO 527	%	4
Nominal elongation at break	ISO 527-2	%	28
Notched impact strength	ISO 180	kJ/m <sup>2</sup>	4,7
Unnotched impact strength	ISO 180	kJ/m <sup>2</sup>	no break
VICAT A (VST)	ISO 306	°C	78*
Melting temperature	ISO 3146-C	°C	180-200
MFR	ISO 1133	g/10min	6
Shrinking	ISO 294-4	%	0,5
Density	ASTM D792	g/cm <sup>3</sup>	1,29
Flammability	UL 94	V-2	-

PRINT SETTINGS	
Nozzle	210 - 230°C
Heatbed	60 - 90°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	20% - 50%
Enclosed space	for larger components
Hardened nozzle	no
Max. Volumetric Speed	12 mm <sup>3</sup> /s

Recommended settings for printers with a 0,4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Clips for labeling

Organization is an important component for optimized workflows. These clips are used to label milling heads in the workshop. Extrudr PETG is ideal for this application due to its high flexibility and good rigidity.

### Vases in numerous color variants

PETG is available in over 30 different color variants. Let your creativity run wild!



→ DOWNLOAD PRINT DATA



## CERTIFICATIONS & ADDITIONAL INFORMATION



FDA compliant



RoHS compliant



REACH compliant



FREE of Silicone



TOY SAFE compliant



FLAMERETARDANT UL 94 V-2

## FEATURES

- ▶ **Matte surface**
- ▶ **High chemical resistance**
- ▶ **Energy-efficient print range 210-230°C**
- ▶ **FDA compliant**
- ▶ **Improved free warping and shrinking technology**
- ▶ **100 % recyclable**
- ▶ **Heat distortion resistance of 85-95°C**

## DESCRIPTION

XPETG MATT has been developed for a wide range of applications where the main requirement is a good balance between optical and mechanical material

properties. In addition, it is more thermally resistant than normal PETG. The raw material is certified according to FDA, REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Tensile modulus (E-Modulus)	ISO 527	MPa	3100 ± 46
Yield stress	ISO 527	MPa	53 ± 0,2
Elongation at yield	ISO 527-2	%	3,5 ± 0,1
Strength	ISO 527	MPa	53 ± 0,2
Elongation at break	ISO 527-2	%	7,6 ± 1,1
Notched impact strength	ISO 180	kJ/m <sup>2</sup>	1,7 ± 0,4
Unnotched impact strength	ISO 180	kJ/m <sup>2</sup>	78 ± 6
Heat Deflection Temperature HDT/B	ISO 15075	°C	67
VICAT A (VST)	ISO 306	°C	85
Density	ISO 1183-1/A	g/cm <sup>3</sup>	1,41
Flammability	UL 94	V-2	-
Shore hardness	ISO 868/D	Shore D	76

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

PRINT SETTINGS	
Nozzle	210 - 240°C
Heatbed	60 - 90°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	20% - 50%
Enclosed space	for larger components
Hardened nozzle	no
Max. Volumetric Speed	12 mm <sup>3</sup> /s

Recommended settings for printers with a 0,4mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE

### Moai - matte instead of glossy

Regular PETG has a glossy surface. XPETG MATT impresses with its matte appearance. The advantage is the higher thermal resistance and stiffness compared to classic PETG.



## FEATURES

- Carbon composite material for performance applications
- Excellent mechanical properties
- High chemical resistance
- Low warping
- Low shrinking

## DESCRIPTION

XPETG CF has been developed for a wide range of applications where the main requirement is a good balance between mechanical and optical material properties. The raw material is certified according

to REACH and RoHS standards. XPETG CF is flame retardant according to UL 94 with a wall thickness of 3.2 mm.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Tensile modulus (E-Modulus)	ISO 527	MPa	3350 ± 50
Yield stress	ISO 527	MPa	59 ± 0,4
Elongation at yield	ISO 527	%	3,8 ± 0,1
Strength	ISO 527	MPa	59 ± 0,4
Elongation at break	ISO 527-2	%	9,4 ± 1,5
Notched impact strength	ISO 180	kJ/m <sup>2</sup>	1,7 ± 0,4
Unnotched impact strength	ISO 180	kJ/m <sup>2</sup>	67 ± 7
Heat Deflection Temperature HDT/B	ISO 75	°C	69
VICAT A (VST)	ISO 306	°C	85
Density	ISO 1183-1XA	g/cm <sup>3</sup>	1,29
Flammability	UL 94	V-2	-

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

PRINT SETTINGS	
Nozzle	220 - 250°C
Heatbed	60 - 90°C
Adhesive	not required
Speed	20 - 200 mm/s
Cooling	20% - 50%
Enclosed space	for larger components
Hardened nozzle	yes
Max. Volumetric Speed	10 mm <sup>3</sup> /s

Recommended settings for printers with a 0.5mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE

### Perfect stability for an impeller

XPETG CF was the perfect choice for this impeller due to its excellent strength, low warping, and high dimensional accuracy. Its durability ensures it can withstand daily use while remaining lightweight and safe.

*"XPETG CF is truly a fantastic material; it has allowed me to create fast prints without compromising quality,"* noted the designer of the impeller.

- Flame retardant according to UL 94 at a wall thickness of 3.2 mm
- Very good impact resistance
- Increased durability due to the carbon fiber content

\*Filament: XPETG CF



## FEATURES

- For industrial applications
- High mechanical stability
- Flame retardant according to UL 94 HB
- Low shrinking and warping
- Electrically insulating
- Excellent layer and bed adhesion

## DESCRIPTION

DuraPro ABS has been specially developed for industrial applications and is characterised by its high process reliability. It is ideal for the production of mechanically highly stressed components. The material is electrically insulating.

DuraPro ABS is optimised for good layer adhesion, thermal stability, better flow properties and low warping. The raw material is approved according to REACH, RoHS and FDA standards.

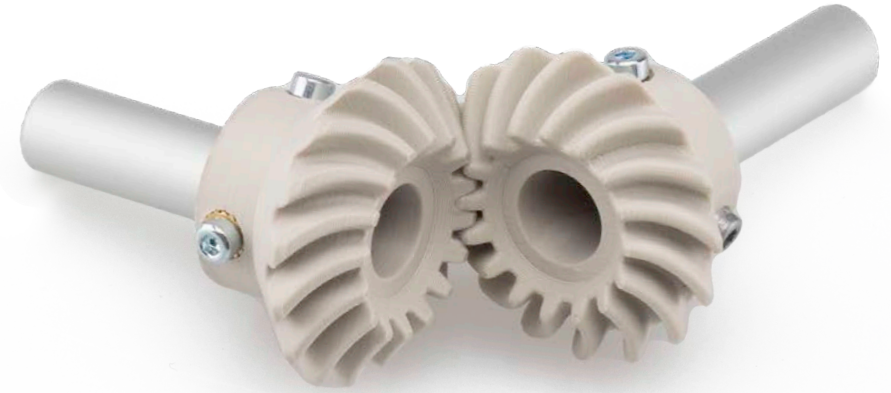
## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Flexural modulus (E-Modulus)	ASTM D790	MPa	2550	Nozzle 220 - 250°C
Flexural strength	ASTM D790	MPa	78	Heatbed 100 - 110°C
Tensile modulus (E-Modulus)	ASTM D638	MPa	2350	Adhesive recommended
Tensile strength	ASTM D638	MPa	49	Speed 20 - 200 mm/s
Elongation at yield	ASTM D638	%	5	Cooling 0% - 50%
Nominal elongation at break	ASTM D638	%	10	Enclosed space yes
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	220 / 23°C	Hardened nozzle no
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	90 / -30°C	Max. Volumetric Speed 16 mm <sup>3</sup> /s
VICAT A (VST)	ASTM D1525	°C	92*	
Melting temperature	ISO 3146-C	°C	180-200	
MFR	ASTM D1238	g/cm <sup>3</sup>	21	
HDT/B	ASTM D648	°C	85	
Shrinking	ASTM D955	%	0,4	
Density	ASTM D792	g/cm <sup>3</sup>	1.06	
Hardness Rockwell	ASTM D785	R-Skala	110	
Flammability	UL94	HB	-	

Recommended settings for printers with a 0.4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Gears

In mechanical and plant engineering, the technical material DuraPro ABS is used to manufacture quickly, precisely, durable, and cost-effective 3D-printed components. Gears can be produced

with high accuracy and strength. 3D printing also enables the production of gears with special shapes and geometries that would be difficult to achieve with conventional manufacturing methods.

- Chemically resistant
- Mechanical properties
- Resistant to fats, oils, & many chemicals
- High surface hardness



INDUSTRIAL



## FEATURES

- ▶ UV and weather resistant
- ▶ Matte surface
- ▶ Exceptional mechanical resistance
- ▶ Good layer and bed adhesion
- ▶ Low warping

## DESCRIPTION

DuraPro ASA has been specially developed for industrial applications and is characterised by its high UV and weather resistance. It is therefore particularly suitable for use in the automotive sector and outdoors. The material is fire retardant

according to UL94 HB. DuraPro ASA has been optimised for the FFF/FDM process, so the material has good layer adhesion, thermal stability, improved flow properties and low warping.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Flexural modulus (E-Modulus)	ASTM D790	MPa	2300
Flexural strength	ASTM D790	MPa	78
Tensile modulus (E-Modulus)	ASTM D638	MPa	2200
Tensile strength	ASTM D638	MPa	49
Elongation at yield	ASTM D638	%	6
Nominal elongation at break	ASTM D638	%	20
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	140 @ 23°C
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	29 @ -30°C
VICAT A (VST)	ASTM D1525	°C	96*
Melting temperature	ISO 3146-C	°C	180-200
MFR	ASTM D1238	g/cm <sup>3</sup>	20
HDT/B	ASTM D648	°C	96
Shrinking	ASTM D955	%	0.4
Density	ASTM D792	g/cm <sup>3</sup>	1.05
Hardness Rockwell	ASTM D785	R-Skala	105
Flammability	UL94	HB	-

PRINT SETTINGS	
Nozzle	220 - 270°C
Heatbed	100 - 110°C
Adhesive	recommended
Speed	20 - 200 mm/s
Cooling	0% - 30%
Enclosed space	yes
Hardened nozzle	no
Max. Volumetric Speed	15 mm <sup>3</sup> /s

Recommended settings for printers with a 0.4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Hydroponic tower

With a hydroponic tower, vegetables can be grown indoors and outdoors in a space-saving manner. The plants do not root in the soil, but their roots are only moistened. DuraPro ASA is the ideal material for printing a hydroponic tower as it is UV and weather resistant.



▶ Space for insert baskets of the plants

▶ Individual elements for screwing together

INDUSTRIAL



## FEATURES

- Carbon composite material for performance applications
- UV and weather resistant
- Matte surface
- High rigidity
- Good heat distortion resistance
- Low warping

## DESCRIPTION

DuraPro ASA CF is a weatherproof and UV-resistant copolymer for industrial applications and is characterised by high process reliability. The material is reinforced with carbon fibres, making it ideal for mechanically highly stressed components.

DuraPro ASA CF is optimised for good layer adhesion, thermal stability, better flow properties and lower warping. The raw material is approved according to REACH and RoHS standards

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Flexural modulus (E-Modulus)	ASTM D790	MPa	4500
Flexural strength	ASTM D790	MPa	78
Tensile modulus (E-Modulus)	ASTM D638	MPa	2500
Tensile strength	ASTM D638	MPa	49
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	100 @ 23°C
Notched impact strength	ASTM D256	kJ/m <sup>2</sup>	20 @ -30°C
VICAT A (VST)	ASTM D1525	°C	101*
Melting temperature	ISO 3146-C	°C	210-250
MFR	ASTM D1238	g/cm <sup>3</sup>	9
HDT/B	ASTM D648	°C	96
Shrinking	ASTM D955	%	0.3
Density	ASTM D792	g/cm <sup>3</sup>	1.14
Hardness Rockwell	ASTM D785	R-Skala	105
Flammability	UL94	HB	-
Carbon fiber content	ASTM D785	%vol	12

PRINT SETTINGS	
Nozzle	240 - 260°C
Heatbed	110°C
Adhesive	recommended
Speed	20 - 200 mm/s
Cooling	0% - 30%
Enclosed space	yes
Hardened nozzle	yes
Max. Volumetric Speed	12 mm <sup>3</sup> /s

Recommended settings for printers with a 0.5mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Bicycle holder

A combination of DuraPro ASA CF and red FLEX Medium results in this masterpiece for securely hanging the bicycle. The good layer adhesion and mechanical strength are perfect for holding the weight of the bike.

- High load capacity
- Flame retardant according to UL94 HB
- High strength & rigidity due to carbon fibers

\*Filament: TPU Medium Hellfire Red (elastic and damping)

INDUSTRIAL



## FEATURES

- Glass fiber composite for performance applications
- UV- and weather-resistant
- Matte finish
- High stiffness
- Good heat resistance
- Low warping

## DESCRIPTION

DuraPro ASA GF is a weather-resistant and UV-stable copolymer for industrial applications, characterized by high process reliability. The material is reinforced with glass fibers, making it ideal for components subjected to high mechanical

stress. DuraPro ASA GF is optimized for good layer adhesion, thermal stability, improved flow properties, and low warping. The raw material complies with REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS	
Flexural Modulus	ASTM D790	MPa	3500 ±200	Nozzle	230-270°C
Flexural Strength	ASTM D790	MPa	3520 ±200	Heatbed	110°C
Tensile Modulus	ASTM D638	MPa	59,8 ±3	Adhesive	recommended
Tensile Strength	ASTM D638	MPa	91,2 ±3	Speed	<180mm/s
Elongation at Yield	ASTM D638	%	3%	Cooling	0-30%
Nominal Elongation at Break	ASTM D638	%	8% -0,02	Enclosed space	yes
Notched Impact Strength	ASTM D256	kJ/m <sup>2</sup>	88	Hardened nozzle	yes
Unnotched Impact Strength	ASTM D256	kJ/m <sup>2</sup>	16	Max. Volumetric Speed	12 mm <sup>3</sup> /s
VICAT A (VST)	ASTM D1525	°C	101		
Melting Temperature	ISO 3146-C	°C	190-210		
MFR (Melt Flow Rate)	ASTM D1238	g/cm <sup>3</sup>	12		
HDT/B (Heat Deflection Temp.)	ASTM D648	°C	99		
Shrinkage	ASTM D955	%	0,30%		
Density	ASTM D792	g/cm <sup>3</sup>	1,1		
Rockwell Hardness	ASTM D785	R-Scale	110		
Flammability	UL94	HB	1,5 mm		

Recommended settings for printers with a 0.5mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE

### Advanced wing applications

The high mechanical strength, low weight, and weather resistance of DuraPro ASA GF enable the production of robust and durable wings, such as the

wing of a model aircraft, which must withstand high loads during VTOL (Vertical Take-Off and Landing) tests.

- High stiffness and lower thermal expansion
- Suitable for precision applications
- Rough surface due to the glass fibers



INDUSTRIAL



## FEATURES

- Excellent mechanical properties
- Low moisture absorption
- High thermal resistance (VICAT A 142°C)
- Good chemical resistance

## DESCRIPTION

DuraPro PA12 is a high-performance polyamide (Nylon) that is ideal for industrial applications. It is characterized by exceptionally high impact and notched impact strength, as well as very good heat

resistance. With its excellent chemical resistance, low moisture absorption, and ease of handling, it is the perfect choice for demanding 3D printing projects.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Density	ISO 1183	g/cm <sup>3</sup>	1.01
Melt Volume Rate (MVR) 235°C/5.0 kg	ISO 1133	cm <sup>3</sup> /10min	8.0
Water absorption (saturation 23°C)	ISO 62	%	1.6
Tensile Modulus	ISO 527-1	MPa	1440
Tensile Strength (deformation)	ISO 527-2	MPa	43.0
Elongation at Yield (deformation)	ISO 527-2	%	5.0
Nominal Elongation at Break	ISO 527-2	%	>50
Charpy Notched Impact Strength (+23°C)	ISO 179/1eA	kJ/m <sup>2</sup>	11
Charpy Notched Impact Strength (-30°C)	ISO 179/1eA	kJ/m <sup>2</sup>	6.0
Charpy Unnotched Impact Strength (+23°C)	ISO 179/1eU		no break (NB)
Charpy Unnotched Impact Strength (-30°C)	ISO 179/1eU		no break (NB)
Puncture Maximum Force (-30°C)	ISO 6603-2	J	60.0
Multiaxial Instrumented Impact Test, Peak Force -30°C	ISO 6603-2	N	4800
Heat Deflection Temperature (DTUL) 0.45 MPa, unannealed	ISO 75-2/B	°C	135
Heat Deflection Temperature (DTUL) 1.8 MPa, unannealed	ISO 75-2/A	°C	55.0
Vicat Softening Temperature	ISO 306/B50	°C	142
Mass Temperature	ISO 11357-3	°C	180
CLTE (Coefficient of Linear Thermal Expansion)	ISO 11359-2	cm/cm/°C	1.0E-4
Specific Surface Resistance	IEC 60093	ohms	1.0E+14
Specific Volume Resistivity	IEC 60093	ohms cm	1.0E+14
Dielectric Strength	IEC 60243-1	kV/mm	30
Comparative Tracking Index (CTI)	IEC 60112	V	600

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Uniform air distribution thanks to flow-optimized design

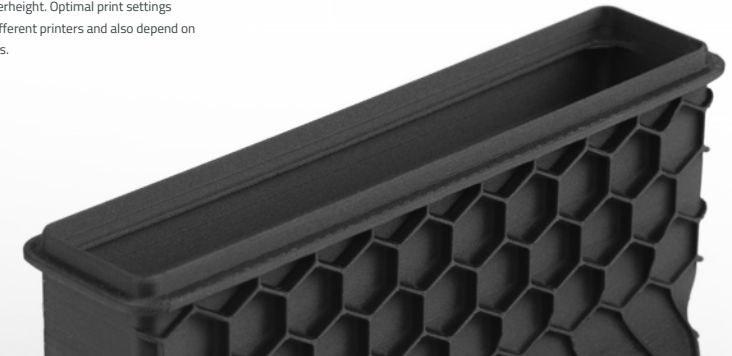
This intake system and intake manifold were developed for the Formula Student. It ensures that air is evenly distributed to all cylinders. The perfectly designed intake manifold can increase the engine's performance by several percent, as it generates minimal flow resistance.

### PRINT SETTINGS

Nozzle	260 - 290°C
Heatbed	110°C
Adhesive	Ja
Speed	150 mm/s
Cooling	40% - 60%
Enclosed space	Ja
Hardened nozzle	Nein
Max. Volumetric Speed	8 mm <sup>3</sup> /s

Recommended settings for printers with a 0.4 mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

- Resistant to temperatures near the engine
- High material stability combined with the honeycomb structure
- Lightweight design thanks to PA12 for motorsport



INDUSTRIAL





# DURAPRO PA12 CF

## FEATURES

- Extremely high strength and stiffness
- High thermal resistance [VICAT A 142°C]
- Excellent dimensional stability, even at high temperatures
- Outstanding chemical resistance

## DESCRIPTION

DuraPro PA12 CF builds on the excellent properties of DuraPro PA12 and enhances them by reinforcing with carbon fibers, taking it to a new level. This filament is ideally suited for industrial applications that require maximum strength, stiffness,

and dimensional stability. Carbon fibers are extremely lightweight, making DuraPro PA12 CF an ideal material for weight-critical applications in aerospace, motorsport, and other sectors.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Density	ISO 1183	g/cm <sup>3</sup>	1.03
Melt Volume Rate (MVR) 235°C/5.0 kg	ISO 1133	cm <sup>3</sup> /10min	7
Water absorption (saturation 23°C)	ISO 62	%	1.6
Tensile Modulus	ISO 527-1	MPa	2820
Tensile Strength (deformation)	ISO 527-2	MPa	60,4
Elongation at Yield (deformation)	ISO 527-2	%	4
Nominal Elongation at Break	ISO 527-2	%	>35
Charpy Notched Impact Strength (+23°C)	ISO 179/1eA	kJ/m <sup>2</sup>	9
Charpy Notched Impact Strength (-30°C)	ISO 179/1eA	kJ/m <sup>2</sup>	5
Charpy Unnotched Impact Strength (+23°C)	ISO 179/1eU		no break (NB)
Charpy Unnotched Impact Strength (-30°C)	ISO 179/1eU		no break (NB)
Puncture Maximum Force (-30°C)	ISO 6603-2	J	62
Multiaxial Instrumented Impact Test, Peak Force -30°C	ISO 6603-2	N	5400
Heat Deflection Temperature (DTUL) 0.45 MPa, unannealed	ISO 75-2/B	°C	139
Heat Deflection Temperature (DTUL) 1.8 MPa, unannealed	ISO 75-2/A	°C	58
Vicat Softening Temperature	ISO 306/B50	°C	145
Mass Temperature	ISO 11357-3	°C	185
CLTE (Coefficient of Linear Thermal Expansion)	ISO 11359-2	cm/cm/°C	1.0E-4
Specific Surface Resistance	IEC 60093	ohms	1.0E+14
Specific Volume Resistivity	IEC 60093	ohms cm	1.0E+14
Dielectric Strength	IEC 60243-1	kV/mm	25
Comparative Tracking Index (CTI)	IEC 60112	V	500

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE

### Clamping Jaw

An example of the use of DuraPro PA12 CF is the clamping jaw of our own extrusion system. Thanks to the outstanding properties of DuraPro PA12 CF, such as extremely high strength, stiffness, and excellent dimensional accuracy, this component is used

daily under demanding conditions. It consistently withstands the pressure and heat in the production process, confirming its high durability and reliability under real-world operating conditions.

3D printing enables the production of cost-efficient components

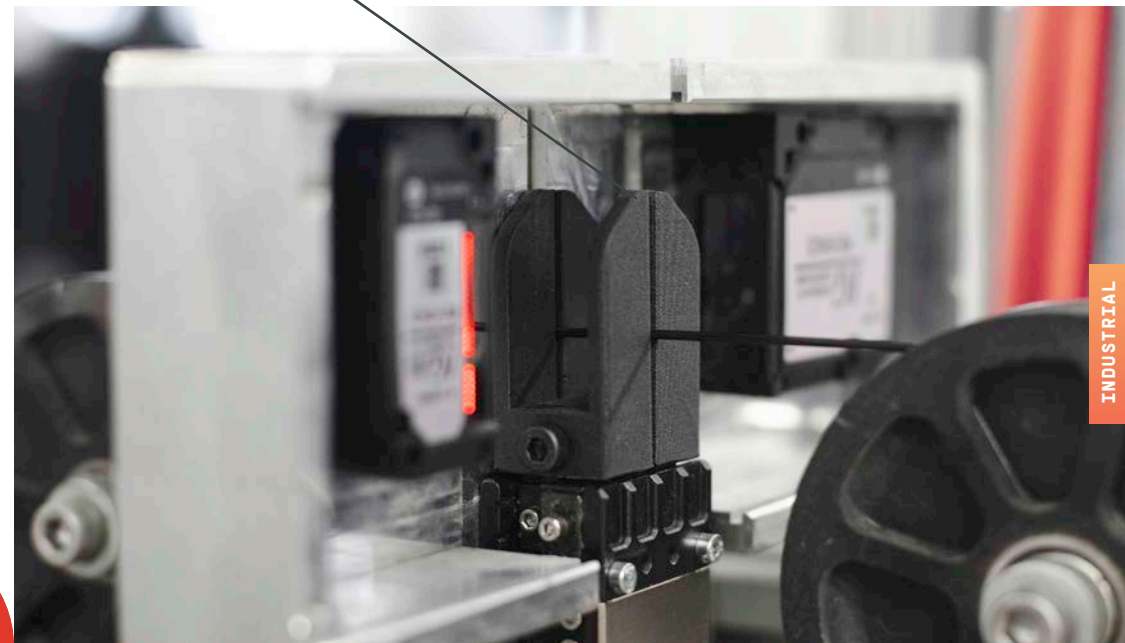
Reliable performance even in challenging environments

### PRINT SETTINGS

Nozzle	260-290 °C
Heatbed	110 °C
Adhesive	recommended
Speed	150 mm/s
Cooling	0-50%
Enclosed space	yes
Hardened nozzle	yes
Max. Volumetric Speed	8 mm <sup>3</sup> /s

Recommended settings for printers with a 0.5 mm Nozzle. Max. 50% layer-height. Optimal print settings may vary between different printers and also depend on environmental factors.

Clamping jaw



INDUSTRIAL





# DURAPRO PC/PBT

## FEATURES

- Excellent mechanical properties
- High heat resistance (VICAT A 126°C)
- Good toughness even at low temperatures (-20°C to -30°C)
- Excellent chemical resistance

## DESCRIPTION

DuraPro PC/PBT is a blend of two materials: polycarbonate (PC) and polybutylene terephthalate (PBT). It combines the strengths of both polymers, making it a versatile material for industrial applications. It offers exceptional mechanical properties along with

excellent heat resistance and performance at low temperatures. Thanks to its outstanding chemical resistance and ease of printability, it is the optimal choice for demanding 3D printing projects.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Melt Volume Flow Rate (MVR)	ISO 1133	cm <sup>3</sup> /10 min	18
Tensile Modulus	ISO 527-1,-2	MPa	2200
Tensile Strength	ISO 527-1,-2	MPa	60
Elongation at Yield	ISO 527-1,-2	%	5
Nominal Elongation at Break	ISO 527-1,-2	%	> 50
Break Strength	ISO 527-1,-2	MPa	50
Flexural Modulus	ISO 178	MPa	2150
Edge Fiber Elongation at Maximum Force	ISO 178	%	6
3.5% - Flexural Stress	ISO 178	MPa	70
Flexural Strength	ISO 178	MPa	80
Charpy Impact Strength	ISO 179/1eU	kJ/m <sup>2</sup>	N
Charpy Notched Impact Strength	ISO 179/1eA	kJ/m <sup>2</sup>	60
Puncture Behavior - Maximum Force	ISO 6603-2	N	3800
Puncture Work	ISO 6603-2	J	47
Izod Impact Strength	ISO 180/U	kJ/m <sup>2</sup>	N
Izod Notched Impact Strength	ISO 180/A	kJ/m <sup>2</sup>	50
Heat Deflection Temperature 1.8 MPa	ISO 75-1,-2	°C	85
Heat Deflection Temperature 0.45 MPa	ISO 75-1,-2	°C	110
Vicat Softening Temperature	ISO 306	°C	126
Density	ISO 1183-1	kg/m <sup>3</sup>	1200

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE

### Component for Injection Molding Robot

The grippers for securely retrieving the injection-molded parts by the robot were 3D printed using DuraPro PC/PBT. Two parts are produced per cycle. First, the injection-molded parts are ejected from the mold by the ejector pins. The suction cups grip

the parts, and the 3D-printed gripper holds them in place. The vacuum created by the gripper also ensures the safe removal of the sprue located in the center of the part.

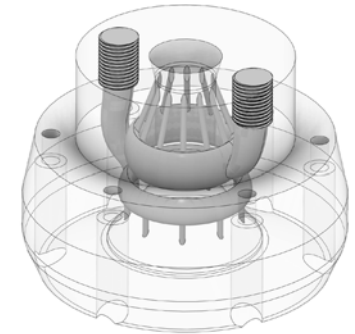
### Rapid Prototyping

3D printing enables rapid iterations, making it ideal for creating prototypes or components. This complex geometry, with integrated air channels, could not have been achieved with traditional manufacturing methods.

- Withstands the residual heat of the injection-molded parts
- Provides the necessary strength and durability
- Anti-warping technology

### DATEN

Manufacturing Time per Component	7:45h
Weight	240 g
Component Cost	14 €/Stk.
Dimensions (x, y, z)	107/107/77 mm
Quantity	2 Stk.



### PRINT SETTINGS

Nozzle	260 - 290°C
Heatbed	110°C
Adhesive	recommended
Speed	max. 280 mm/s
Cooling	0 - 30%
Enclosed space	yes
Hardened nozzle	no
Max. Volumetric Speed	18 mm <sup>3</sup> /s

Recommended settings for printers with a 0.4 mm Nozzle. Max. 50% layer-height. Optimal print settings may vary between different printers and also depend on environmental factors.

INDUSTRIAL



## CERTIFICATIONS & ADDITIONAL INFORMATION





# DURAPRO PC/PBT CF

## FEATURES

- Carbon Composite for Performance Applications
- Excellent Mechanical Properties
- Smooth Surface with Carbon Aesthetic
- Thermal Resistance [VICAT A 130°C]
- Very Good Chemical Resistance

## DESCRIPTION

DuraPro PC/PBT with carbon fiber reinforcement takes the properties of the base material to a new level, making it one of the most high-performance thermoplastic materials for technical applications. Carbon fibers are extremely lightweight, making PC-

PBT with carbon fiber reinforcement a lightweight material with an excellent stiffness-to-strength-to-weight ratio. Additionally, the material offers improved heat resistance, and printing is possible without shrinking and warping.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Density	ISO 1183	g/cm <sup>3</sup>	1.01
Melt Volume Flow Rate (MVR) 235°C/5.0 kg	ISO 1133	cm <sup>3</sup> /10min	8.0
Water absorption (saturation 23°C)	ISO 62	%	1.6
Tensile Modulus	ISO 527-1	MPa	1440
Tensile Strength (deformation)	ISO 527-2	MPa	43.0
Elongation at Yield (deformation)	ISO 527-2	%	5.0
Nominal Elongation at Break	ISO 527-2	%	>50
Charpy Notched Impact Strength (+23°C)	ISO 179/1eA	kJ/m <sup>2</sup>	11
Charpy Notched Impact Strength (-30°C)	ISO 179/1eA	kJ/m <sup>2</sup>	6.0
Charpy Unnotched Impact Strength (+23°C)	ISO 179/1eU		no break (NB)
Charpy Unnotched Impact Strength (-30°C)	ISO 179/1eU		no break (NB)
Puncture Maximum Force (-30°C)	ISO 6603-2	J	60.0
Multiaxial Instrumented Impact Test, Peak Force -30°C	ISO 6603-2	N	4800
Heat Deflection Temperature (DTUL) 0.45 MPa, unannealed	ISO 75-2/B	°C	135
Heat Deflection Temperature (DTUL) 1.8 MPa, unannealed	ISO 75-2/A	°C	55.0
Vicat Softening Temperature	ISO 306/B50	°C	142
Mass Temperature	ISO 11357-3	°C	180
CLTE (Coefficient of Linear Thermal Expansion)	ISO 11359-2	cm/cm/°C	1.0E-4
Specific Surface Resistance	IEC 60093	ohms	1.0E+14
Specific Volume Resistivity	IEC 60093	ohms cm	1.0E+14
Dielectric Strength	IEC 60243-1	kV/mm	30
Comparative Tracking Index (CTI)	IEC 60112	V	600

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE

### Pulley System

The effectiveness of a rope system depends on the strength and durability of the material used. The carbon fiber reinforcement allows the pulley to

withstand significant mechanical forces without deforming or breaking.

- Precision manufacturing for consistent results
- High printing accuracy
- Low wear of printed components

### PRINT SETTINGS

Nozzle	265-295 °C
Heatbed	110 °C
Adhesive	recommended
Speed	max. 250 mm/s
Cooling	0-30%
Enclosed space	yes
Hardened nozzle	yes
Max. Volumetric Speed	18 mm <sup>3</sup> /s

Recommended settings for printers with a 0.5 mm Nozzle. Max. 50% layer-height. Optimal print settings may vary between different printers and also depend on environmental factors.



INDUSTRIAL



## CERTIFICATIONS & ADDITIONAL INFORMATION





# TPU FLEX SEMISOFT

## FEATURES

- Very impact and breakage resistant
- Shore hardness A85
- Halogen-free
- UV-resistant
- Free of silicone, plasticisers and oils
- Extreme layer adhesion

## DESCRIPTION

TPU FLEX Semisoft has been specially developed for the FDM/FFF process. Based on Polycaprolactone-Polyester, it offers an extensibility of up to 550%, high material quality, high chemical resistance, and

a heat distortion resistance of up to 98°C, making the material suitable for numerous industrial applications. The raw material is compliant with REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS
Tensile modulus (E-Modulus)	ISO 527-2/5A/500	MPa	42	Nozzle 220 - 250°C
Ultimate elongation	ISO 527-2/5A/500	%	550	Heatbed 50 - 90°C
Stress at break	ISO 527-2/5A/500	MPa	9 (50%)	Adhesive not required
	ISO 527-2/5A/500	MPa	11 (100%)	Speed 20 - 100 mm/s
	ISO 527-2/5A/500	MPa	22 (300%)	Cooling 0% - 30%
VICAT A (VST)	ISO 306	°C	98*	Enclosed space no
Melting temperature	ISO 3146-C	°C	180-230	Hardened nozzle no
Density	ISO 2781	g/cm <sup>3</sup>	1.18	Max. Volumetric Speed 2,8 mm <sup>3</sup> /s
Abrasion resistance	ISO 4649-A	mm <sup>3</sup>	25	
Shore hardness	ISO 868	Shore	85A - 88A	
Tear strength	ISO 34-1B	kN/m	135	
Glass transition temperature		°C	-34	
Compressive strength	DIN 53452	MPa	42	
Permeability AIR	DIN 53380	25°/60°C	550/-	
Permeability N2	DIN 53380	25°/60°C	380/2200	
Permeability O2	DIN 53380	25°/60°C	950/5100	
Permeability CO2	DIN 53380	25°/60°C	7300/19900	
Permeability N2O	DIN 53380	25°/60°C	13800/-	
Poisson-ratio	acc. to Hencky		0.46	

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



© POP Fender | www.popfender.com

### Prototype for the new generation of fenders

Limited space on the boat is no longer a problem, as the POPFender fende telescopic on both sides from 62 to 25 cm. Extruder FLEX Semisoft was used for prototyping.

- Shore hardness A85
- Damping properties
- Withstanding high mechanical loads and pressure



INDUSTRIAL



## CERTIFICATIONS & ADDITIONAL INFORMATION





# TPU FLEX MEDIUM

## FEATURES

- Very impact and breakage resistant
- Shore hardness A98
- Halogen-free
- UV-resistant
- Free of silicone, plasticisers and oils
- Extreme layer adhesion

## DESCRIPTION

TPU FLEX Medium has been specially developed for the FDM/FFF process. Based on Polycaprolactone-Polyester, it offers an extensibility of up to 470%, high material quality, high chemical resistance, and

a heat distortion resistance of up to 115°C, making the material suitable for numerous industrial applications. The raw material is compliant with REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS	
Tensile modulus (E-Modulus)	ISO 527-2/5A/500	MPa	40	Nozzle	230 - 250°C
Ultimate elongation	ISO 527-2/5A/500	%	475	Heatbed	50 - 90°C
Stress at break	ISO 527-2/5A/500	MPa	-(50%)	Adhesive	not required
	ISO 527-2/5A/500	MPa	17 (100%)	Speed	20 - 100 mm/s
	ISO 527-2/5A/500	MPa	30 (300%)	Cooling	0% - 30%
VICAT A (VST)	ISO 306	°C	110*	Enclosed space	no
Melting temperature	ISO 3146-C	°C	190-220	Hardened nozzle	no
Density	ISO 2781	g/cm³	1.19	Max. Volumetric Speed	3,2 mm³/s
Abrasion resistance	ISO 4649-A	mm³	25		
Shore hardness	ISO 868	Shore	98A		
Tear strength	ISO 34-1B	kN/m	170		
Glass transition temperature		°C	-30		
Compressive strength	DIN 53452	MPa	40		
Permeability AIR	DIN 53380	25°/60°C	450/-		
Permeability N2	DIN 53380	25°/60°C	330/1800		
Permeability O2	DIN 53380	25°/60°C	840/4500		
Permeability CO2	DIN 53380	25°/60°C	6500/19000		
Permeability N2O	DIN 53380	25°/60°C	12400/-		
Poisson-ratio	acc. to Hencky		0.47		

\* Temperature resistance tested at a minimum wall thickness of 4 mm  
Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Maximum flexibility

TPU is used for components where elasticity, flexibility, and durability are required. An additional advantage is its damping property, which can be enhanced by the geometry of the 3D printed part.

### Timing belt for mechanical applications

- Elastic
- Extremely durable
- Shore hardness A98
- Available in 10 colors



INDUS



## CERTIFICATIONS & ADDITIONAL INFORMATION



FDA compliant



RoHS compliant



REACH compliant



CHEMICAL resistant



FREE of Silicone



SHORE A98

## FEATURES

- ▶ **Electrostatic Resistance:**  
0.7 – 0.9 MΩ
- ▶ **ESD-C Conductive**
- ▶ **Cleanroom Compliant**
- ▶ **Highly impact resistant**
- ▶ **Shore Hardness A95**
- ▶ **Chemical resistance to oils, gasoline, esters, ketones, and chlorinated hydrocarbons**

## DESCRIPTION

TPU Flex Medium ESD (electrostatic discharge) is a filament specially developed for the FDM/FFF process. Based on Polycaprolactone-Polyester, it combines the advantages of TPU with ESD

protection. The material effectively dissipates static electricity and thus protects sensitive electronic devices from damage.

## PROPERTIES

TEST	METHOD	UNIT	VALUE	PRINT SETTINGS	
Specific Gravity (20°C)	DIN 53.479	g/cm <sup>3</sup>	1,20	Nozzle	220-250 °C
Melt Flow Rate (MFR) (220°C/10.0 kg) -		g/10min	50-70	Heatbed	50 °C
Shore Hardness	DIN 53.505	-	A92	Adhesive	not required
Melting Range	KOFLER	°C	175-185	Speed	max. 50 mm/s
Softening Range	KOFLER	°C	160-165	Cooling	60-100 %
Softening Point	KOFLER	°C	150-170	Enclosed space	no
Hydrolysis Resistance	-	-	gut	Hardened nozzle	no
Chemical Resistance	-	-	gut	Max. Volumetric Speed	3,2 mm <sup>3</sup> /s
Tensile Strength	DIN 53.504	MPa	40		
Elongation at Break	DIN 53.504	%	430		
Tear Strength	DIN 53.515	kN/m	110		
Abrasion Loss	DIN 53.516	mm <sup>3</sup>	28		
Electrical Conductivity	DIN EN 61340-2-3	MΩ	0,7 - 0,9		

\* Temperaturreisistenz geprüft bei Wanddicke von mindestens 4 mm.  
Weitere Informationen in den regulatorischen-, chemischen- und Zusatzinformationsblättern.

Recommended settings for printers with a 0.4mm Nozzle.  
Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

## SHOWCASE

### Raspberry Pi 5 Case

A 3D-printed case for the Raspberry Pi 5 offers a customized solution to protect it from damage. By using TPU FLEX Medium ESD, the case provides optimal protection against electrostatic discharges,

safeguarding the sensitive components of the Raspberry Pi. The case's design ensures optimal airflow and easy access to all ports.

- ▶ **Combination of TPU flexibility and ESD protection**
- ▶ **Durable**
- ▶ **Ideal for environments where electronic components are handled or assembled**



INDUSTRIAL





# TPU FLEX HARD

## FEATURES

- Very impact and breakage resistant
- Shore hardness D58
- Halogen-free
- UV-resistant
- Free of silicone, plasticisers and oils
- Extreme layer adhesion

## DESCRIPTION

TPU FLEX Hard has been specially developed for the FDM/FFF process. Based on Polycaprolactone-Polyester, it offers an extensibility of up to 480%, high material quality, high chemical resistance, and

a heat distortion resistance of up to 140°C, making the material suitable for numerous industrial applications. The raw material is compliant with REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Tensile modulus (E-Modulus)	ISO 527-2/5A/500	MPa	40
Ultimate elongation	ISO 527-2/5A/500	%	490
Stress at break	ISO 527-2/5A/500	MPa	16 (50%)
	ISO 527-2/5A/500	MPa	16 (100%)
	ISO 527-2/5A/500	MPa	29 (300%)
VICAT A (VST)	ISO 306	°C	140*
Melting temperature	ISO 3146-C	°C	190-210
Density	ISO 2781	g/cm <sup>3</sup>	1.2
Abrasion resistance	ISO 4649-A	mm <sup>3</sup>	26
Shore hardness	ISO 868	Shore	58D
Tear strength	ISO 34-1B	kN/m	175
Glass transition temperature		°C	-24
Compressive strength	DIN 53453	MPa	40
Permeability AIR	DIN 53380	25°/60°C	420/-
Permeability N2	DIN 53380	25°/60°C	300/1600
Permeability O2	DIN 53380	25°/60°C	790/3900
Permeability CO2	DIN 53380	25°/60°C	5800/1700
Permeability N2O	DIN 53380	25°/60°C	11600/-
Poisson-ratio	acc. to Hencky		0.45

PRINT SETTINGS	
Nozzle	230 - 260°C
Heatbed	50 - 90°C
Adhesive	not required
Speed	20 - 100 mm/s
Cooling	0% - 30%
Enclosed space	no
Hardened nozzle	no
Max. Volumetric Speed	4,6 mm <sup>3</sup> /s

Recommended settings for printers with a 0,4mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm. Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Flexible adhesive shoe for horse hooves

Ton-heavy loads must be withstood by a hoof protection. In contrast to classic horseshoes made of steel, a glue-on shoe made of TPU FLEX Hard is flexible. The material protects the joints due to its damping effect and the hoof is protected from excessive abrasion.



- Shore hardness D58
- Impact and breakage resistant
- Damping effect



INDUSTRIAL





# TPU FLEX HARD CF

## FEATURES

- Extreme layer adhesion
- Carbon look
- Very low warping
- Excellent chemical resistance
- Free of silicone, plasticisers, oil and halogen
- UV-resistant

## DESCRIPTION

TPU FLEX Carbon combines the two worlds of fibre composites and the extremely resistant and durable elastomer based on polycaprolactone polyester. The carbon reinforces the TPU and makes it more resistant and stiffer. In addition, an excellent carbon look is created. The material is also very

easy to process and has very low warping. It has been specially developed for industrial applications. The material is optimised for the FFF/FDM process with regard to thermal stability and better flow properties. The raw material is compliant with REACH and RoHS standards.

## PROPERTIES

TEST	METHOD	UNIT	VALUE
Tensile modulus (E-Modulus)	ISO 527-2/5A/500	MPa	35
Ultimate elongation	ISO 527-2/5A/500	%	380
Stress at break	ISO 527-2/5A/500	MPa	14 (50%)
	ISO 527-2/5A/500	MPa	14 (100%)
	ISO 527-2/5A/500	MPa	27 (300%)
VICAT A (VST)	ISO 306	°C	140*
Melting temperature	ISO 3146-C	°C	200-240
Density	ISO 2781	g/cm <sup>3</sup>	1.22
Abrasion resistance	ISO 4649-A	mm <sup>3</sup>	26
Shore hardness	ISO 868	Shore	70D
Tear strength	ISO 34-1B	kN/m	165
Glass transition temperature		°C	-24
Compressive strength	DIN 53453	MPa	50
Permeability AIR	DIN 53380	25°/60°C	420/-
Permeability N2	DIN 53380	25°/60°C	300/1600
Permeability O2	DIN 53380	25°/60°C	790/3900
Permeability CO2	DIN 53380	25°/60°C	5800/1700
Permeability N2O	DIN 53380	25°/60°C	11600/-
Poisson-ratio	acc. to Hencky		0.45

## PRINT SETTINGS

Nozzle	230 - 260°C
Heatbed	50 - 90°C
Adhesive	not required
Speed	20 - 100 mm/s
Cooling	10% - 30%
Enclosed space	no
Hardened nozzle	yes

Recommended settings for printers with a 0.5mm Nozzle. Max. 50% layerheight. Optimal print settings may vary between different printers and also depend on environmental factors.

\* Temperature resistance tested at a minimum wall thickness of 4 mm

Additional info in our regulatory, additional information and chemical resistance data sheets.

## SHOWCASE



### Longboard Wheel

We have designed our own longboard wheels, printed them using Extruder FLEX Hard Carbon, and had them tested by a professional longboarder.



- Abrasion resistant
- Damping properties
- Extreme layer bonding

### → YOUTUBE VIDEO



INDUSTRIAL



## CERTIFICATIONS & ADDITIONAL INFORMATION



RoHS compliant



REACH compliant



CHEMICAL resistant



FREE of Silicone



SHORE D70

The reason for our existence

## Company purpose

Innovation is in Extrudr's DNA. The circular process of questioning, creating opportunities, and forging new paths allows us to drive innovation forward.

Progress is inconceivable without revolution. For us, the revolution came when we decided to develop and optimize our own machines from scratch, enabling us in turn to produce the best products.

The design and development process is guided and driven by inspiration. From individual makers

to large corporations, to our employees who form the foundation of our company, we foster and welcome creativity and inspiration that lead to the implementation of innovative ideas.

We are striving for innovation and technological leadership in independent existence, in thinking, in our culture, right down to the smallest step in the production process.

**INNOVATION**

**REVOLUTION**

**INSPIRATION**

**VISION**





## OUR EMPLOYEES

# 30 employees

We are a community that values diversity, flexibility, both in thought and action, and team focus as central factors for achieving a common goal.

In team collaboration, we bring out the best in ourselves and others.

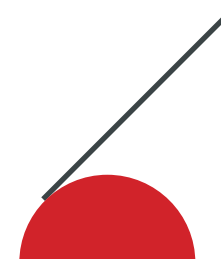
We believe that in the right environment and with the right support, anything is possible.



This sets us apart

# Community

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## Various colors

### in our range

For us, creativity is the art of creating, testing, and restarting until we find the perfect solution. Challenges enable innovation, and diversity drives it forward.

We rely on the unique ideas and experiences of each individual to collaborate and achieve the common goal together.



This sets us apart

# Creativity

---



## PRODUCTION

# 864 km

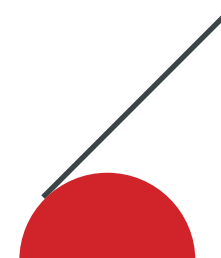
Filament daily

With this impressive production capacity, we can circumnavigate the globe in just 47 days or travel the distance from earth to the moon within a year. This achievement underscores the outstanding efficiency and quality that we represent in 3D filament production.

This sets us apart

# Authenticity

---



Temperature: 20-25°C (68-77°F)  
Net weight: 1.75 lb (793g)  
Dimensions: 10.5" x 7.5" x 5.5" (L x W x H)  
Please Recycle  
REACH  
RoHS  
FDA  
PHEMOS  
PLA  
100% Biodegradable

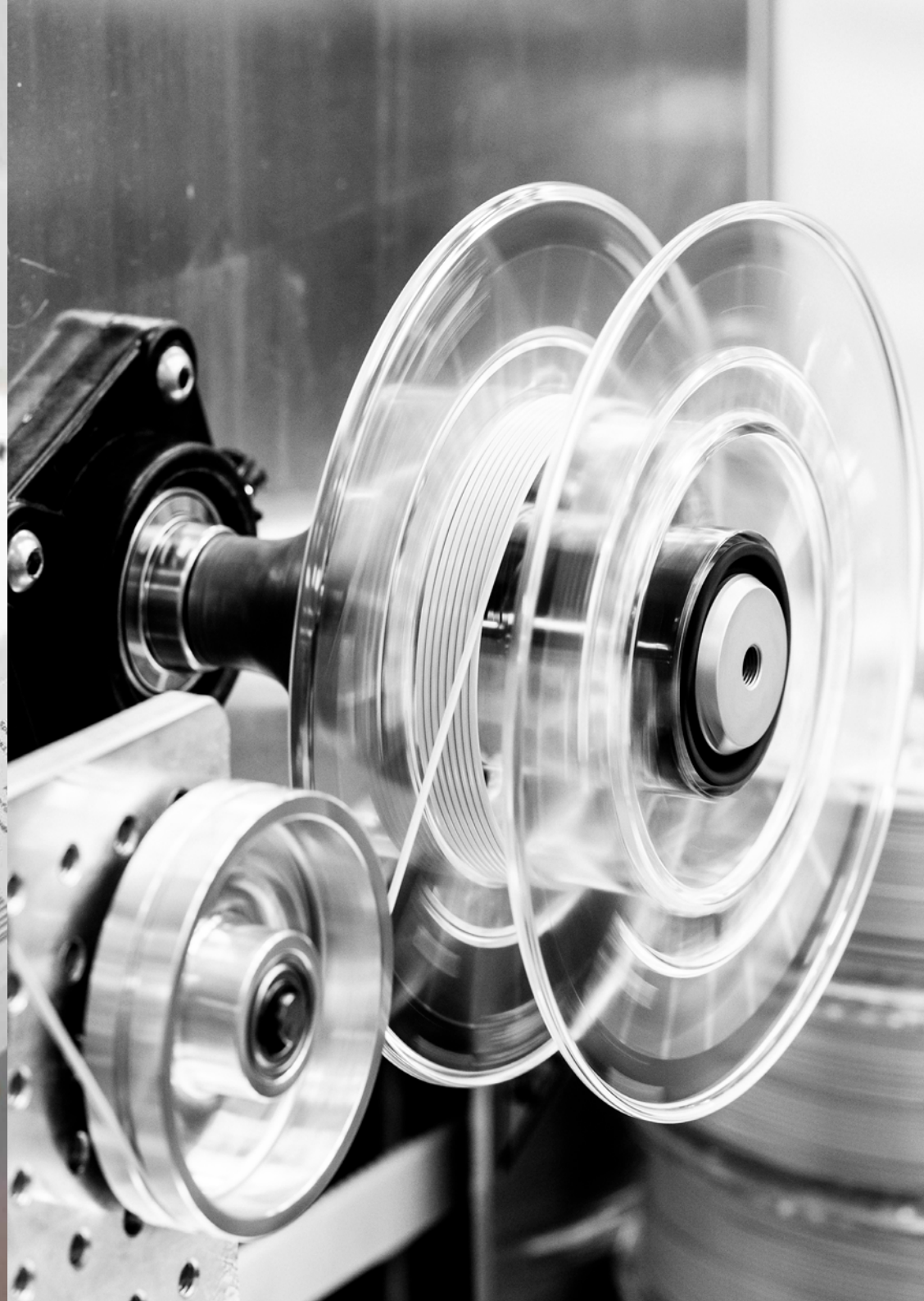
Temperature: 20-25°C (68-77°F)  
Net weight: 1.75 lb (793g)  
Dimensions: 10.5" x 7.5" x 5.5" (L x W x H)  
Please Recycle  
REACH  
RoHS  
FDA  
PHEMOS  
PLA  
100% Biodegradable

Temperature: 20-25°C (68-77°F)  
Net weight: 1.75 lb (793g)  
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REACH  
RoHS  
FDA  
PHEMOS  
PLA  
100% Biodegradable

Temperature: 20-25°C (68-77°F)  
Net weight: 1.75 lb (793g)  
Dimensions: 10.5" x 7.5" x 5.5" (L x W x H)  
Please Recycle  
REACH  
RoHS  
FDA  
PHEMOS  
PLA  
100% Biodegradable



  
PLA #12  
Military green  
1.75 lb (793g)  
Temperature: 20-25°C (68-77°F)  
Net weight: 1.75 lb (793g)  
Dimensions: 10.5" x 7.5" x 5.5" (L x W x H)  
Please Recycle  
REACH  
RoHS  
FDA  
PHEMOS  
PLA  
100% Biodegradable



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