DATASHEET

LUVOCOM® 3F PET CF 9780 BK

Polyethylene Terephthalate PET
15 % Carbon Fiber Reinforced, Black

LUVOCOM® 3F FILAMENT
Additive manufacturing solutions

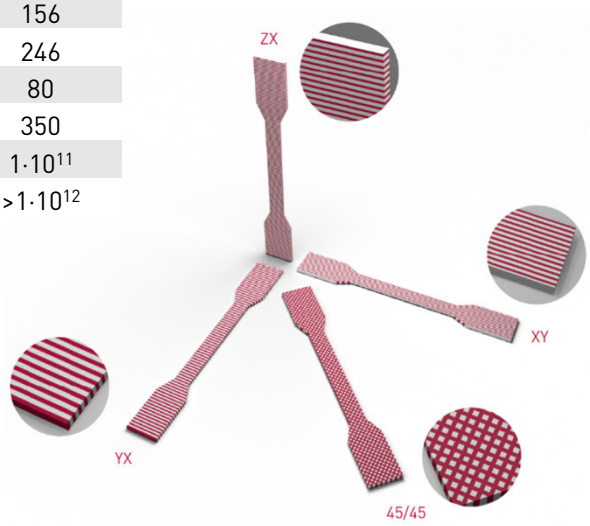
Description

LUVOCOM 3F PET CF 9780 BK is a polyethylene terephthalate (PET) reinforced with 15% carbon fiber by weight, which was specially developed for 3D printing. The temperature resistance of PET is significantly higher than that of PETG. It is the easiest to print fiber-filled material on the market, as warping is non-existent. Very good mechanical key figures and very good surface qualities on the printed part characterize the material. The very low moisture absorption offers dimensionally stable components. PET is resistant to many chemicals. The filament can be printed at fast speeds and does not require a heated build chamber if there is sufficient hot-end power. Performance can be further improved by annealing.

MECHANICAL PROPERTIES				Print Orientation		
	Unit	Standard	XY	45/45	YX	ZX
Tensile Strength	[MPa]	ISO 527-2	85	58	60	31
Tensile Modulus	[GPa]	ISO 527-2	9.18	4.67	4.67	2.5
Elongation @ Break	[%]	ISO 527-2	1.6	3.3	2.2	1.7
Flexural Strength	[MPa]	ISO 178	127	96	84	50
Flexural Modulus	[GPa]	ISO 178	9.13	4.40	3.84	2.24
Impact Strength 1eU	[kJ/m²]	ISO 180	30	18	16	4

Results on Bambu Lab H2D at 20 mm³/s flow (parameter set "LEHVOSS series"). 0.6 mm nozzle. 100 % infill. Non-annealed samples. Qualified filament.

MATERIAL PROPERTIES	Unit	Standard	Value
Spec. Density	[g/cm³]	ISO 1183	1.4
Moisture Uptake	[%]	ISO 62	< 0.3
HDT @ 0.45 MPa	[°C]	ISO 75	205
HDT @ 1.80 MPa	[°C]	ISO 75	156
Melting Point	[°C]	ISO 11357	246
Glass Transition Temp.	[°C]	ISO 11357	80
Decomposition Temp.	[°C]	ISO 11358	350
Volume Resistance (500 V)	[Ω]	EN 62631	$1 \cdot 10^{11}$
Surface Resistance	[Ω]	EN 62631	$>1 \cdot 10^{12}$



Properties

- Stiff and strong
- Temperature resistant
- Chemically resistant
- Very good surface quality
- Can be printed without heated build chamber
- Stronger and higher temperature-resistant than PETG

Material Twin

Corresponding injection molding material: LUVOTECH® eco PBT GF20 BK. This material twin has a performance profile that leads to comparable results in injection molding to 3D printing.

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Material handling and drying

Dry

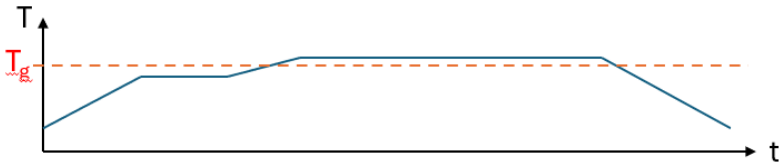
To remove residual moisture, the filament should be dried before processing. We recommend a convection oven with even temperature distribution. Duration: min. 24 h. Temperature: 90 °C.

Keep dry

To avoid moisture condensation on the filament surface, we recommend using a drying box. Temperature 80 °C.

Annealing

For printers with an unheated installation space, annealing of the components is recommended to relieve stress and ensure the full crystallinity, high strength and temperature resistance of the material. To do this, the component must be heated in a controlled manner and cooled to a temperature above the glass transition temperature:



1) Heat room temperature to 80 °C, 2) Hold at 80 °C, 3) Heat up to 95 °C, 4) Hold at 95 °C (1 h per mm wall thickness), 5) Cool to room temperature.
We recommend programmable drying ovens for this purpose, e.g. from the manufacturer Memmert.

Processing

Printing Parameters

Depending on the printing platform and equipment: Temp.: 300 to 350 °C, Flow: 0.95 to 1, Ø nozzle (hardened): 0.4 to 0.6 mm (recommended for process reliability: 0.6 mm), Layer thickness: 0.2 to 0.4 mm. Print parameter sets for different printers on request.

Pressure plate

The material can be printed on almost all build plates. We recommend printing plates from the manufacturer 3D-MATT.

Support materials

The material is compatible with PVA, BVOH, HIPS and PVOH support materials.

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