DATASHEET

LUVOCOM® 3F PPS CF 50899 BK

Polyphenylene Sulfide PPS
10 % carbon fiber reinforced, black

LUVOCOM® 3F FILAMENT
Additive manufacturing solutions

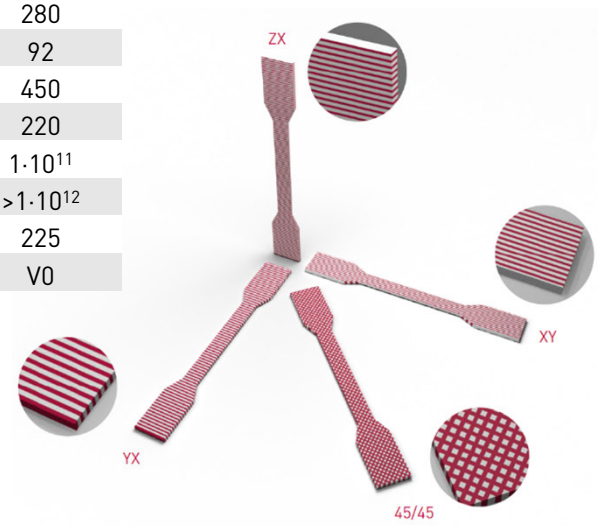
Description

LUVOCOM 3F PPS CF 50899 BK is a carbon fiber reinforced polyphenylene sulfide (PPS) with 10 weight-% carbon fiber concentration, specifically developed for 3D printing. PPS is a semi-crystalline high-performance polymer with very good mechanical, thermal, and chemical resistance properties: a rigid-stiff material for structural components, high temperature resistance, inherently flame-resistant (UL94 certificates available upon request), dimensionally stable due to very low moisture absorption. There is no solvent known that can attack PPS up to 200 °C. Despite carbon fiber reinforcement, the material is electrically insulating and therefore poses no risk of contact corrosion. The filament can be printed at high speeds and does not require a heated build chamber when sufficient hot end power is available.

MECHANICAL PROPERTIES						
			Print Orientation			
	Unit	Standard	XY	45/45	YX	ZX
Tensile Strength	[MPa]	ISO 527-2	75	67	67	46
Tensile Modulus	[GPa]	ISO 527-2	7,53	5.13	4,90	3.15
Elongation @ Break	[%]	ISO 527-2	1,2	1.7	1.7	1.7
Flexural Strength	[MPa]	ISO 178	129	113	96	76
Flexural Modulus	[GPa]	ISO 178	6.75	4.60	3.98	2.86
Impact Strength 1eU	[kJ/m²]	ISO 180	15	14	17	11

Results on Bambu Lab H2D at 200 mm/s print speed (parameter set „LEHVOSS Serie"). 0,6 mm nozzle. 100 % infill. Non-annealed samples. Qualified filament from supplier 3D-Druck Matt.

MATERIAL PROPERTIES			
	Unit	Standard	Value
Spec. Density	[g/cm³]	ISO 1183	1.48
Moisture Uptake	[%]	ISO 62	< 0.05
HDT @ 0.45 MPa	[°C]	ISO 75	239
HDT @ 1.80 MPa	[°C]	ISO 75	233
Melting Point	[°C]	ISO 11357	280
Glass Transition Temp.	[°C]	ISO 11357	92
Decomposition Temp.	[°C]	ISO 11358	450
Continuous Use Temp.	[°C]	ISO 3167A	220
Volume Resistance (500 V)	[Ω]	EN 62631	$1 \cdot 10^{11}$
Surface Resistance	[Ω]	EN 62631	$>1 \cdot 10^{12}$
CTI	[V]	IEC 60112	225
Flame Resistance		UL94	V0



Properties

- Stiff and strong
- High temperature resistance
- Excellent chemical resistance
- Flame resistance
- Excellent surface quality
- No heated Build chamber needed
- Cost-effective PEAK alternative

Material Twin

The corresponding injection molding material is LUVOTECH® eco PPS GFM65 BK. This material twin exhibits a performance profile that leads to comparable results in injection molding as in 3D printing.

LEHVOSS Group

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Material handling and drying

Drying

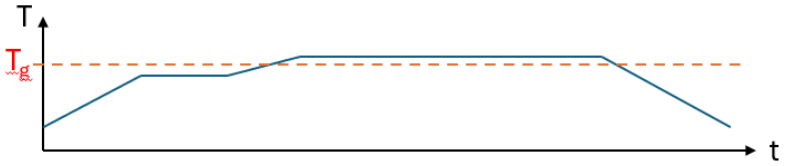
To remove residual moisture, the filament should be dried before processing. We recommend a convection oven with uniform temperature distribution. Duration: at least 24 hours. Temperature: 90 °C.

Stay dry

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

Annealing

For printers with an unheated build chamber, it is advisable to anneal the components to relieve stresses and ensure full crystallinity, high strength, and temperature resistance of the material. For this, the component must be heated and cooled to and from a temperature above the glass transition temperature in a controlled way:



1) Heating from room temperature to 95 °C, 2) Holding at 95 °C, 3) Heating to 130 °C, 4) Holding at 130 °C (1 hour per mm wall thickness), 5) Cooling to room temperature. We recommend using programmable drying cabinets, such as those from the manufacturer Memmert.

Processing

Print parameters

Depending on the printer and equipment: Temperature: 300 to 350 °C, flow: 0.95 to 1, nozzle diameter (hardened): 0.4 to 0.6 mm (0.6 mm recommended for process reliability), layer thickness: 0.2 to 0.4 mm. Print parameter sets for different platforms are available upon request.

Print plate

We recommend printing plates from the manufacturer 3D-MATT. The use of adhesives is not necessary. The component separates after cool down. As a standard build plate: PEI structured.

Support material

The material is compatible with PPS CF BAW, supplier 3D-Druck Matt. Soluble support material available upon request.

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