



TECHNICAL DATA SHEET



PET-CF

15% chopped carbon fiber reinforced Polyethylene Terephthalate FDM material.

Product Description

PET-CF is specially developed for FDM 3D printing process, and its substrate material is PET engineering plastic with low moisture absorption, high strength, creep resistance, excellent chemical resistance and high heat resistance. With good dimensional stability, no warpage and no shrinkage and no smell, no heating chamber are required during the printing process.

It can be used with S-PET Quick-Remove Support Material to solve the problem of poor molding effect of supporting surface of complex model.

Product Advantages

- Smart Fiber Reinforced Technology
This technology controlling the dispersion and distribution of chopped carbon fibers within the material matrix during the extrusion process, the fibers form a mesh skeleton structure within the material and bear most of the load transferred by the material matrix. Smart Fiber Reinforced Technology greatly improves the mechanical properties and heat resistance of the material, and releases the internal stress during the printing process through the fiber mesh structure, resulting in good dimensional stability of the printed part and no warpage.
- Low creep
The molecular chain structure of PET is highly regular and has a rigid benzene ring structure, so that PET has better mechanical properties and less deformation under long-term load. Compared with PA and PC materials, PET has better creep-resistance.

Available

Colors	■Black
Diameter	1.75mm/2.85mm
Net weight	500g/1kg/2.5kg

Material Properties

Property	Testing method	Typical value
Density	ISO 1183	1.30 g/cm³
Water absorption	ISO 62: Method 1	0.5 %
Melting Temperature	ISO 11357	251 °C
Melt index	270 °C, 2.16 kg	4.7
Determination of temperature	ISO 75: Method A	112.1 °C (1.80MPa)
	ISO 75: Method B	148.8 °C (0.45MPa)
Tensile strength(X-Y)		87.41 ± 3.57 MPa
Young's modulus(X-Y)	ISO 527	6025.53 ± 355.46 MPa
Elongation at break (X-Y)		1.99 ± 0.18 %
Bending strength (X-Y)	ISO 178	122.69 ± 5.19 MPa
Bending modulus (X-Y)		5313.21 ± 197.89 MPa
Charpy impact strength (X-Y)	ISO 179	5.57 ± 0.58 KJ/m²
Tensile strength (Z)		33.61 ± 1.74 MPa
Young's modulus (Z)	ISO 527	3194.73 ± 74.46 MPa
Elongation at break (Z)		1.25 ± 0.09 %

Specimens printed under the following conditions: Nozzle temp 320°C, Bed temp 80°C, Print speed 45mm/s, Infill 100%, Infill angle ±45°
 Post-processing: 100°C Annealing 8 hours

Recommended printing conditions

Nozzle Temperature	280-320 °C
Recommended Nozzle Diameter	0.4-1.0 mm
Recommended build surface treatment	PEI or Coating with PVP glue
Build plate temperature	60-80 °C
Raft separation distance	0.08-0.12 mm
Cooling fan speed	Off
Print speed	30-90 mm/s
Retraction distance	1-3 mm
Retraction speed	1800-3600 mm/min
Recommended support material	S-PET Quick-Remove Support

Additional Suggestions:

1. Although the moisture absorption of PET material is very low, it is very sensitive to moisture. Printing after absorbing moisture will result in oozing, extruding with bubbles and rough surface appearance, thus reducing print quality. It is recommended that put the filament into a dry box (humidity below 15%) immediately after opening the PET-CF vacuum foil bag for printing. Please put the unused filament back into the original aluminum foil bag for sealed storage.

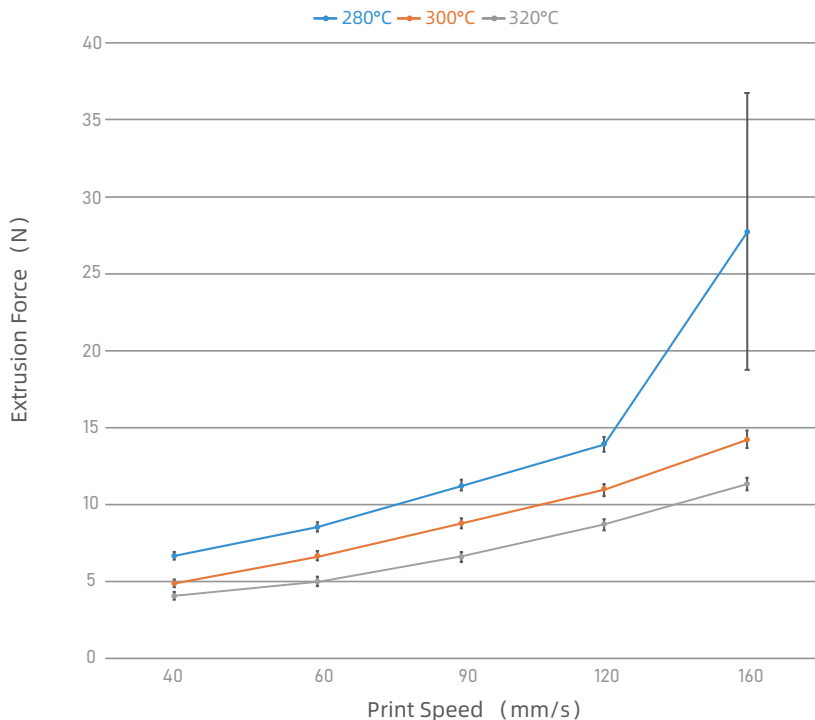
2. After the material is damp, there will be more printing oozing, bubbles extruded and rough printing surface. Please dry the filament in an oven at 100-120°C for 4-6h to restore the printing quality of PET-CF.

3. Phaetus hardened steel and above grade nozzles shall be selected, which can effectively improve the print quality. Besides, it is recommended that the thickness of the heating block should no less than 12mm.

4. After the printing, the printed part can be annealed to further improve the strength of PET-CF print part. Annealing conditions: place the printed part at 80-100 for 4-8 hours and cool to room temperature naturally.

Extrusion Force vs Print Speed Test

PET-CF
15% Carbon Fiber Reinforced PET



Test parameters: 12mm length brass heat block, BMG extruder, Phaetus Hardened Steel Nozzle, Nozzle size 0.4mm, Layer Height 0.2mm.



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