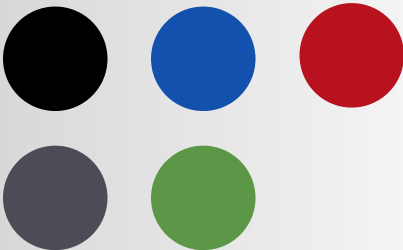




## Technical Data Sheet

# PLA Carbon Fiber

### Available colors



### Product overview

Professional Lab PLA Carbon Fiber is a reinforced PLA filament designed for users who need improved stiffness and dimensional stability while maintaining the ease of printing typical of standard PLA. By combining plant-based PLA with carbon fiber reinforcement, the material delivers higher rigidity and a more professional surface finish without requiring complex printing conditions.

This filament is intended for functional parts, technical prototypes, and structural components where low weight, good strength, and clean print quality are important. Its matte carbon-fiber appearance makes it suitable for both engineering and visual applications.

### Product features

#### Improved Stiffness and Shape Stability

Carbon fiber reinforcement increases rigidity and reduces deformation during printing. Parts retain their geometry well, making the material suitable for functional components exposed to everyday mechanical loads.

#### Lightweight and Functional Strength

PLA Carbon Fiber offers a strong stiffness-to-weight ratio. It is well suited for brackets, frames, housings, and drone components where reduced weight and structural reliability are required.

#### Easy and Consistent Printing

The material prints at moderate PLA-compatible temperatures and supports high printing speeds. It delivers clean extrusion and a smooth matte surface finish with reduced visible layer lines.

#### Eco-Conscious Material Base

Based on renewable PLA, the filament maintains the environmental advantages of standard PLA while offering enhanced mechanical performance compared to unfilled PLA.

## Printing Recommendations

- Nozzle temperature: 215–245°C
- Build surface material: soft magnetic sheet, PEI, glass
- Build surface treatment: none required
- Build plate temperature: 50–60°C
- Cooling fan: 100% / on
- Printing speed: 50–200 mm/s
- Raft separation distance: 0.4–0.6 mm
- Retraction distance: 5 mm
- Retraction speed: 50 mm/s

Based on a 0.4 mm nozzle. Printing conditions may vary with different nozzle diameters.

## Drying recommendations

If moisture exposure is suspected, dry the filament at 50°C for 4–6 hours before printing to improve surface quality and extrusion consistency. Store the filament in a dry, sealed container with desiccant to maintain stable printing performance.

## Precautions

**Printer Compatibility:** Compatible with most FDM printers operating at PLA temperatures. For extended use, a hardened steel nozzle is recommended to reduce wear caused by carbon fiber particles.

**Cooling Settings:** Print with 100% cooling to support clean edges, detailed surface finish, and reduced deformation.

**Shrinkage & Warping Control:** The material exhibits moderate shrinkage but remains dimensionally stable for most applications. For large prints, maintain consistent room temperature and airflow to prevent edge lifting.

**Filament Storage:** Store in a dry, cool environment. Although PLA absorbs less moisture than nylon, composites with carbon fiber benefit from sealed storage to preserve extrusion quality.

## Printing & Handling Guidelines

Professional Lab PLA Carbon Fiber is compatible with most FDM/FFF printers designed for PLA materials. Due to the abrasive nature of carbon fiber particles, the use of a hardened steel nozzle is recommended for long-term use.

Active cooling is advised to maintain sharp details and dimensional accuracy. Stable room temperature and consistent airflow help reduce deformation in larger prints.

## Important Notes

- Carbon-fiber-reinforced PLA – hardened nozzle recommended
- Active cooling required for best surface quality
- Not suitable for high-temperature applications (may deform above ~60°C)
- Print parameters may vary depending on printer and setup

Property	Test Standard	Unit	Typical Value
Density	ASTM D792	g/cm <sup>3</sup>	1.2
Tensile Strength	ASTM D638	MPa	44.8
Young's Modulus	ASTM D638	MPa	3530
Elongation at Break	ASTM D638	%	4.1
Flexural Strength	ASTM D790	MPa	64
Flexural Modulus	ASTM D790	MPa	2432
Izod Impact Strength (Notched, 23°C)	ASTM D256	J/m	32
Heat Deflection Temperature (0.45 MPa)	ASTM D648	°C	53
Glass Transition Temperature (T <sub>g</sub> )	ASTM D7426	°C	59
Melting Temperature	ASTM D7426	°C	168.6
Vicat Softening Temperature	ASTM D1525	°C	54
Melt Flow Rate (190°C / 2.16 kg)	ASTM D1238	g/10 min	7
Mold Shrinkage	ASTM D955	%	0.3–1.1

## Disclaimer of Liability

The information provided in this datasheet is based on internal testing and is intended for reference and comparison only. Actual performance may vary due to printer configuration, nozzle condition, environmental factors, and part design. Carbon-fiber-reinforced materials may accelerate nozzle wear; users are responsible for ensuring hardware compatibility and proper maintenance. Professional Lab assumes no liability for damage, print failures, or performance deviations resulting from improper use. Always store, handle, and dispose of materials responsibly and in accordance with local regulations.

