



## Bambu Filament

Technical Data Sheet V1.0

# PPA-CF

### • Basic Info

**Bambu PPA-CF** - a premium fiber-reinforced nylon, delivers industrial-grade printing quality with precise 1:1 reproduction. Renowned for its exceptional mechanical properties and reliable performance in humid or high-temperature environments, Bambu PPA-CF is ideal for engineering applications, from mechanical prototypes to automotive components. Additionally, its broad printer compatibility sets a new standard for professional engineering filaments. Experience the power of Bambu PPA-CF and bring your designs to life!

### • Specifications

Subjects	Data
Diameter	1.75 ± 0.05 mm
Net Filament Weight	0.75 kg
Spool Material	Cardboard Spool (Temperature resistance 145 °C)
Spool Size	Diameter: 200 mm; Height: 67 mm

### • Recommended Printing Settings

Subjects	Data
Drying Settings before Printing	Blast Drying Oven: 100 - 140 °C, 8 - 12 h (within this range, a higher temp, a better drying result) X1 Series Printer Heatbed: 110 - 120 °C, 12 h (not as good as a blast drying oven)
Printing and Storage Humidity	< 20% RH (Sealed, with desiccant)
Nozzle Size	0.4, 0.6 ( recommended ), 0.8 mm
Nozzle Temperature	280 - 310 °C
Bed Type	Smooth PEI Plate or Textured PEI Plate
Bed Surface Preparation	Glue Stick
Bed Temperature	100 - 120°C
Cooling Fan	Turn on
Printing Speed	< 100 mm/s

Retraction Length	0.8 - 1.4 mm
Retraction Speed	20 - 40 mm/s
Chamber Temperature	50 - 80 °C
Max Overhang Angle	~ 70 °
Max Bridging Length	~ 40 mm
Support Material	Support for PA/PET

## • Properties

Bambu Lab has tested the differing aspects in the performance of PPA-CF material, including physical, mechanical, and chemical properties. Typical values are listed as followed:

Physical Properties		
Subjects	Testing Methods	Data
Density	ISO 1183	1.25 g/cm <sup>3</sup>
Melt Index	280 °C, 2.16 kg	8.4 ± 0.7 g/10 min
Melting Temperature	DSC, 10 °C/min	258 °C
Glass Transition Temperature	DSC, 10 °C/min	85 °C
Crystallization Temperature	DSC, 10 °C/min	178 °C
Vicar Softening Temperature	ISO 306, GB/T 1633	232 °C
Heat Deflection Temperature	ISO 75 1.8 MPa	196 °C
Heat Deflection Temperature	ISO 75 0.45 MPa	227 °C
Saturated Water Absorption Rate	25 °C, 55% RH	1.30%

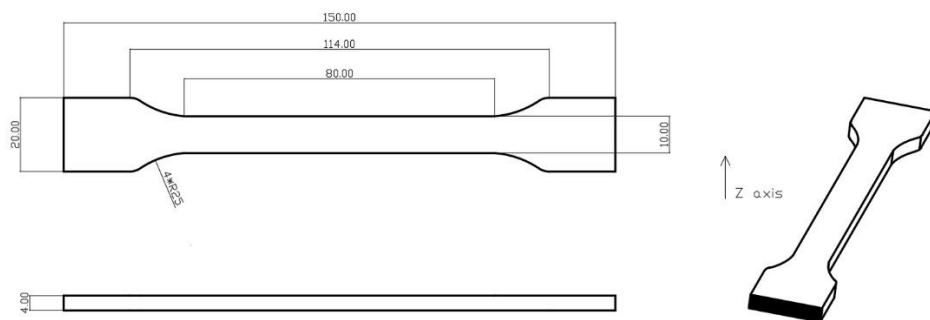
Mechanical Properties		
Subjects	Testing Methods	Data
Young's Modulus (X-Y)	ISO 527, GB/T 1040	11800 ± 670 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	4300 ± 340 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	168 ± 4 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	57 ± 5 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	3.2 ± 0.4 %
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	0.9 ± 0.2 %
Bending Modulus (X-Y)	ISO 178, GB/T 9341	9860 ± 480 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	3240 ± 360 MPa
Bending Strength (X-Y)	ISO 178, GB/T 9341	208 ± 6 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	63 ± 4 MPa
Impact Strength (X-Y)	ISO 179, GB/T 1043	41.7 ± 2.8 kJ/m <sup>2</sup> 6.5 ± 2.3 kJ/m <sup>2</sup> (notched)
Impact Strength (Z)	ISO 179, GB/T 1043	4.3 ± 0.4 kJ/m <sup>2</sup>

Other Physical and Chemical Properties	
Subjects	Data
Odor	Odorless
Composition	Semi-aromatic Nylon, carbon fiber
Skin Hazards	No hazard
Chemical Stability	Stable under normal storage and handling conditions
Solubility	Insoluble in water
Resistance to Acid	Better than general Nylon; resistant to weak acids, but not resistant to strong acids
Resistance to Alkali	Better than general Nylon; resistant to weak alkalis, but not resistant to strong alkalis
Resistance to Organic Solvent	Better than general Nylon; resistant to most kinds of organic solvents
Resistance to Oil and Grease	Better than general Nylon; resistant to most kinds of oil and grease
Flammability	Flammable
Combustion Products	Water, carbon oxides, nitrogen oxides, etc.
Odor of Combustion Products	Pungent odor

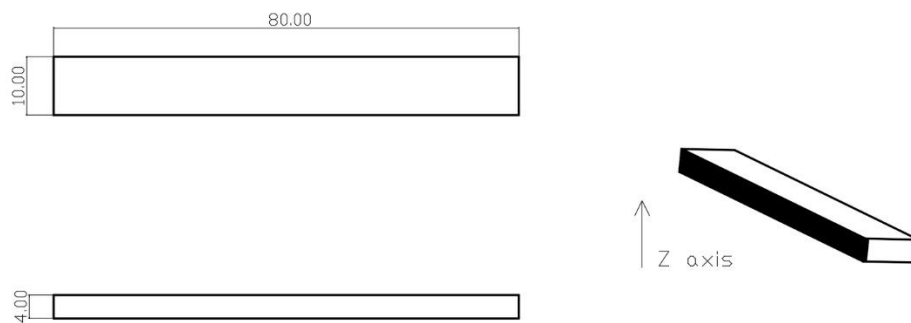
- **Specimen Test**

Specimen Printing Conditions	
Subjects	Data
Nozzle Temperature	290 °C
Bed Temperature	110 °C
Printing Speed	80 mm/s
Infill Density	100%
<p><i>* All the specimens were printed at the following settings: Printer = X1C, Chamber Temperature = 52 °C, Nozzle Temperature = 290 °C, Printing Speed = 80 mm/s, Bed Temperature = 110 °C, Infill Density = 100%. If higher chamber temperature were used (i.g., 70 - 80 °C), higher mechanical properties would be obtained, especially the Z-direction's. All the specimens were not annealed before testing. And the suggested annealing temperature of models printed with Bambu PPA-CF is 120 to 140 °C, and the time is 6 to 12 hours. The annealing effect depends on the annealing temperature, time and the model itself: size, structure, infill and other printing settings; some prints may deform, warp and get decreased in toughness after annealing. When drying the filament and annealing the prints, it's required to use an oven that has big enough inside volume and can provides even temperature distribution, such as a blast drying oven (forced-air drying oven), and the filament and prints need to be away from the heater, and a micro-wave oven or kitchen oven is not compatible, otherwise the filament and prints can get damaged.</i></p>	

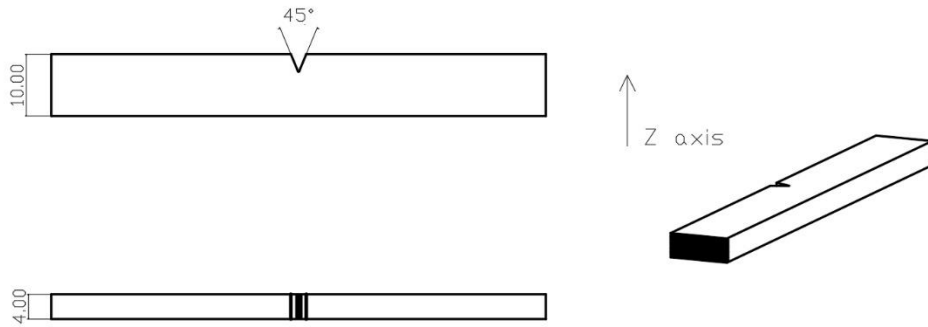
## 1. Tensile Testing



## 2. Bending Testing



## 3. Impact Testing



- **Disclaimer**

The performance values are tested by standard samples at Bambu Lab, and the values are for design reference and comparison only. Actual 3D printing model performance is related to many other factors, including printers, printing conditions, printing models, printing parameters, etc.

In the process of using Bambu Lab 3D printing filaments, users are responsible for the legality, safety, and performance indicators of printing. Bambu Lab is not responsible for the use of materials and scenarios and is not responsible for any damage that occurs in the process of using our filaments.