Bambu Filament

Technical Data Sheet V3.0

PA6-CF

• Basic Info

Bambu PA6-CF is a carbon fiber reinforced PA6 (Nylon 6) filament. The carbon fiber reinforcement provides significantly high stiffness and strength properties in dry environments and maintains exceptional heat resistance and impact resistance. Similar to other Bambu CF Filaments, these outstanding mechanical properties make it an ideal choice for printing fixtures, clamps, automotive and mechanical components and various structural and engineering parts that used in dry environments.

• Specifications

Subjects	Data
Diameter	1.75 mm
Net Filament Weight	1 kg
Spool Material	PC + ABS (Temperature resistance 90 °C)
Spool Size	Diameter: 200 mm; Height: 67 mm

• Recommended Printing Settings

Subjects	Data
Drying Settings before Printing	Blast Drying Oven: 80 °C, 8 - 12 h X1 Series Printer Heatbed: 90 - 100 °C, 12 h
Printing and Keeping Container's Humidity	< 20% RH (Sealed, with desiccant)
Nozzle Size	0.4, 0.6 (Recommended), 0.8 mm
Nozzle Temperature	260 - 290 °C
Build Plate Type	Engineering Plate, High Temperature Plate or Textured PEI Plate
Build Plate Surface Preparation	Glue
Bed Temperature	80 - 100 °C
Cooling Fan	0 - 60%
Printing Speed	< 100 mm/s
Retraction Length	0.8 - 1.4 mm
Retraction Speed	20 - 40 mm/s
Chamber Temperature	45 - 60 °C

Max Overhang Angle	~ 70 °
Max Bridging Length	~ 40 mm
Support	Support for PA/PET

• Properties

Bambu Lab has tested the differing aspects in the performance of PA6-CF material, including physical, mechanical, and chemical properties. Typical values are listed as followed:

Physical Properties		
Subjects	**Testing Methods**	**Data**
Density	ISO 1183	1.09 g/cm³
Melt Index	280 °C, 2.16 kg	6.8 ± 0.6 g/10 min
Melting Temperature	DSC, 10 °C/min	223 °C
Glass Transition Temperature	DSC, 10 °C/min	68 °C
Crystallization Temperature	DSC, 10 °C/min	185 °C
Vicat Softening Temperature	ISO 306, GB/T 1633	212 °C
Heat Deflection Temperature	ISO 75 1.8 MPa	164 °C
Heat Deflection Temperature	ISO 75 0.45 MPa	186 °C
Saturated Water Absorption Rate	25 °C, 55% RH	2.35%

Mechanical Properties		
Subjects	**Testing Methods**	**Data**
Young's Modulus (X-Y)	ISO 527, GB/T 1040	4430 ± 310 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	2170 ± 230 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	102 ± 7 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	48 ± 6 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	5.8 ± 1.6 %
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	3.7 ± 0.8 %
Bending Modulus (X-Y)	ISO 178, GB/T 9341	5460 ± 280 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	2240 ± 220 MPa
Bending Strength (X-Y)	ISO 178, GB/T 9341	151 ± 8 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	80 ± 7 MPa
Impact Strength (X-Y)	ISO 179, GB/T 1043	40.3 ± 2.5 kJ/m²; 13.4 ± 1.7 kJ/m² (notched)
Impact Strength (Z)	ISO 179, GB/T 1043	15.5 ± 1.7 kJ/m²

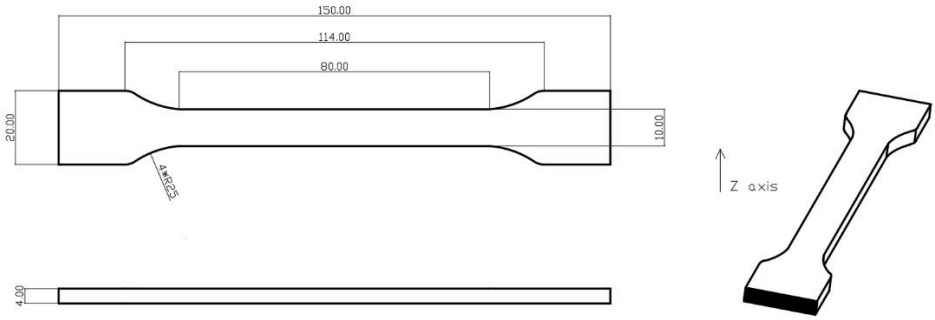
Other Physical and Chemical Properties	
Subjects	**Data**
Odor	Odorless
Composition	Nylon 6, carbon fiber
Skin Hazards	No hazard
Chemical Stability	Stable under normal storage and handling conditions
Solubility	Insoluble in water
Resistance to Acid	Not resistant
Resistance to Alkali	Not resistant
Resistance to Organic Solvent	Not resistant to some organic solvents
Resistance to Oil and Grease	Resistant to most kinds of oil and grease
Flammability	Flammable
Combustion Products	Water, carbon oxides, nitrogen oxides
Odor of Combustion Products	Pungent odor

- **Specimen Test**

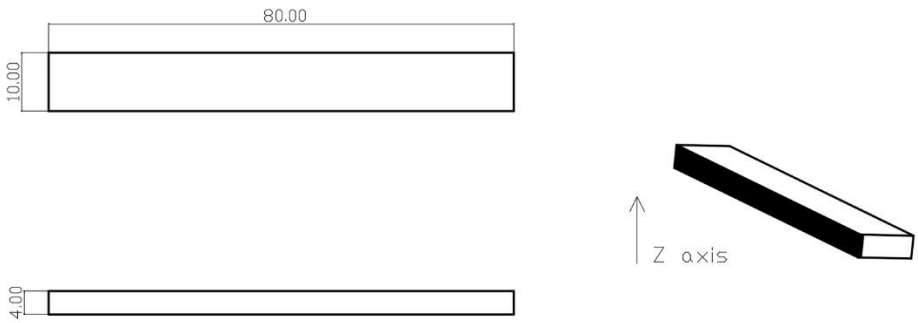
Specimen Printing Conditions	
Subjects	**Data**
Nozzle Temperature	280 °C
Bed Temperature	100 °C
Printing Speed	100 mm/s
Infill Density	100%

* *All the specimens were printed at the following settings: Nozzle Temperature = 280 °C, Printing Speed = 100 mm/s, Bed Temperature = 100 °C, Infill Density = 100%. All the specimens were annealed and dried at 80 °C for 12 h before testing. And the suggested annealing temperature of models printed with Bambu PA6-CF is 80 to 130 °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 and warp 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.*

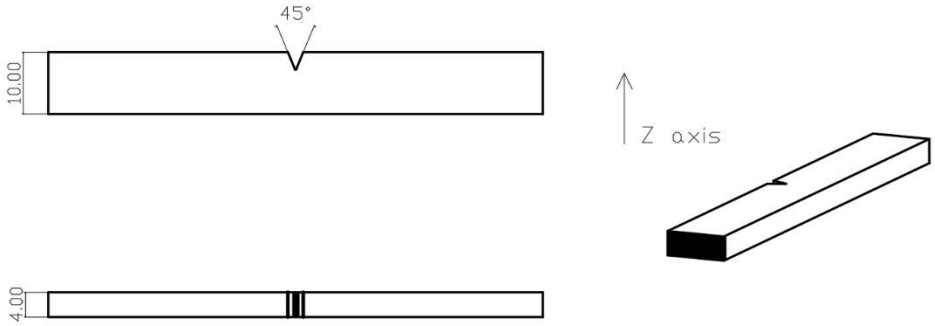
1. Tensile Testing



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.