Bambu Filament

Technical Data Sheet V3.0

PAHT-CF

• Basic Info

Bambu PAHT-CF is a high-temperature engineering-grade carbon-fiber reinforced nylon that is designed for applications where high strength, stiffness, and temperature resistance are required. It is easy to print, has enhanced Z-bonding, a high-degree of dimensional stability, and has been optimized to retain excellent mechanical properties when wet. **Suggested uses are:** functional prototypes, machining fixtures, injection molds, jigs, and low-volume production parts.

• Specifications

Subjects	Data
Diameter	1.75 mm
Net Filament Weight	0.5 kg, 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 Storage Humidity	< 20% RH (Sealed with desiccant)
Bed Type	Engineering Plate, High Temperature Plate or Texture PEI Plate
Nozzle Size	0.4, 0.6(recommended), 0.8 mm
Nozzle Temperature	260 - 290 °C
Bed Surface Preparation	Glue
Bed Temperature	80 - 100 °C
Cooling Fan	0 - 40%
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 Material	Bambu Support for PA/PET

• Properties

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

Physical Properties		
Subjects	**Testing Methods**	**Data**
Density	ISO 1183	1.06 g/cm³
Melt Index	280 °C, 2.16 kg	14.4 ± 2.0 g/10 min
Melting Temperature	DSC, 10 °C/min	225 °C
Glass Transition Temperature	DSC, 10 °C/min	70 °C
Crystallization Temperature	DSC, 10 °C/min	140 °C
Vicar Softening Temperature	ISO 306, GB/T 1633	220 °C
Heat Deflection Temperature	ISO 75 1.8 MPa	170 °C
Heat Deflection Temperature	ISO 75 0.45 MPa	194 °C
Saturated Water Absorption Rate	25 °C, 55% RH	0.88%

Mechanical Properties （Dry state）		
Subjects	**Testing Methods**	**Data**
Young's Modulus (X-Y)	ISO 527, GB/T 1040	3860 ± 230 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	2180 ± 130 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	92 ± 7 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	47 ± 5 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	8.4 ± 1.8 %
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	4.1 ± 1.2 %
Bending Modulus (X-Y)	ISO 178, GB/T 9341	4230 ± 210 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	1820 ± 170 MPa
Bending Strength (X-Y)	ISO 178, GB/T 9341	125 ± 7 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	61 ± 5 MPa
Impact Strength (X-Y)	ISO 179, GB/T 1043	57.5 ± 3.4 kJ/m²; 22.8 ± 1.8 kJ/m² (notched)
Impact Strength (Z)	ISO 179， GB/T 1043	13.3 ± 0.8 kJ/m²

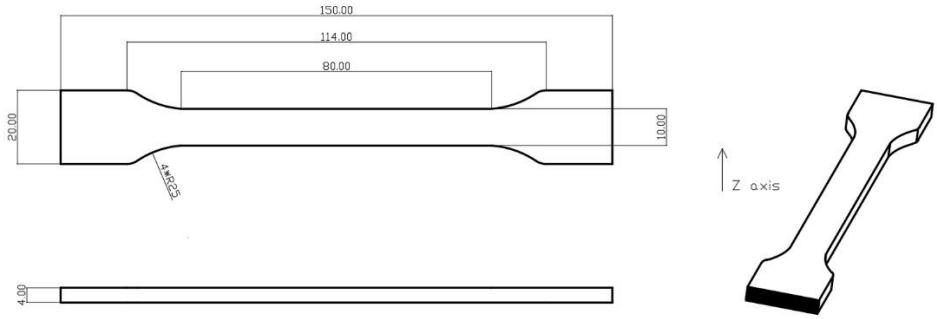
Other Physical and Chemical Properties	
Subjects	**Data**
Odor	Odorless
Composition	PA 12 and other long-chain PA, carbon fiber
Skin Hazards	No hazard
Chemical Stability	Stable under normal storage and handling conditions
Solubility	Insoluble in water
Resistance to Acid	Not resistant
Resistance to Alkali	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**

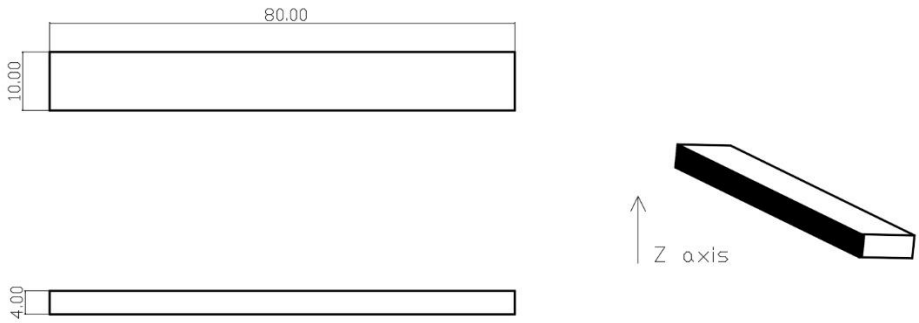
Specimen Printing Conditions	
Subjects	**Data**
Nozzle Temperature	290 °C
Bed Temperature	100 °C
Printing Speed	100 mm/s
Infill Density	100%

** All the specimens were printed at the following settings: Nozzle Temperature = 290 °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 PAHT-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.*

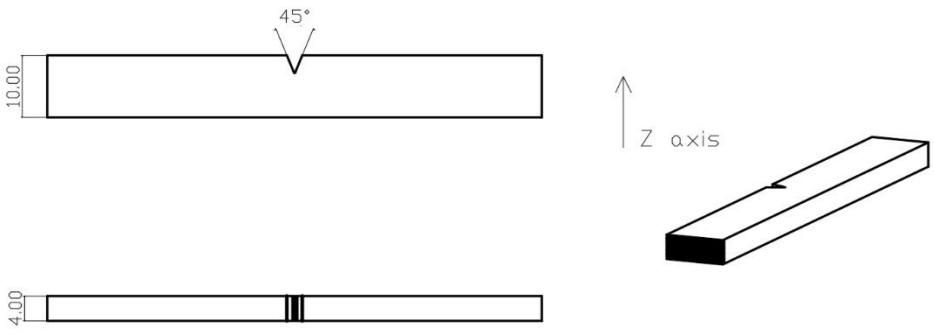
1.Tensile Testing



2.Flexural 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.