Bambu Filament

Technical Data Sheet V1.0

PPS-CF

• Basic Info

Bambu PPS-CF is a composite material made from carbon fiber-reinforced polyphenylene sulfide. The combination of PPS resin and carbon fiber gives PPS-CF exceptional properties, including excellent resistance to solvents, corrosion, heat, and flames. Additionally, it offers superior strength, stiffness, and dimensional stability, making it a specialized engineering plastic that meets the demands of unique and challenging applications.

• 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 X1 Series Printer Heatbed: 110 - 120°C, 12 h
Printing and Storage Humidity	< 20% RH (Sealed with desiccant)
Nozzle Size	0.4, 0.6 (recommended), 0.8 mm
Nozzle Temperature	310 - 340 °C
Build Plate Type	Smooth PEI Plate / Textured PEI Plate
Bed Surface Preparation	Glue
Bed Temperature	100 - 120 °C
Cooling Fan	0 - 40%
Printing Speed	< 100 mm/s
Retraction Length	0.8 - 1.4 mm

team@additive-x.com
01765 694007

Retraction Speed	20 - 40 mm/s
Chamber Temperature	60 - 90 °C
Max Overhang Angle	~ 70°
Max Bridging Length	~ 40 mm
Support	/

• Properties

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

Physical Properties		
Subjects	**Testing Methods**	**Data**
Density	ISO 1183	1.26 g/cm³
Melt Index	320 °C, 2.16 kg	11.48 ± 1.23 g/10 min
Melting Temperature	DSC, 10 °C/min	284 °C
Glass Transition Temperature	DSC, 10 °C/min	100 °C
Crystallization Temperature	DSC, 10 °C/min	214 °C
Vicat Softening Temperature	ISO 306, GB/T 1633	268 °C
Heat Deflection Temperature	ISO 75 1.8 MPa	235 °C
Heat Deflection Temperature	ISO 75 0.45 MPa	264 °C
Saturated Water Absorption Rate	25 °C, 55% RH	0.05%

Mechanical Properties		
Subjects	**Testing Methods**	**Data**
Young's Modulus (X-Y)	ISO 527, GB/T 1040	8230 ± 270 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	2850 ± 160 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	87 ± 5 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	24 ± 3 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	1.2 ± 0.4 %
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	0.7 ± 0.3 %
Bending Modulus (X-Y)	ISO 178, GB/T 9341	7160 ± 280 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	2460 ± 190 MPa
Bending Strength (X-Y)	ISO 178, GB/T 9341	142 ± 5 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	36 ± 4 MPa
Impact Strength (X-Y)	ISO 179, GB/T 1043	27.8 ± 2.3 kJ/m²; 6.2 ± 1.6 kJ/m² (notched)
Impact Strength (Z)	ISO 179, GB/T 1043	2.8 ± 0.4 kJ/m²

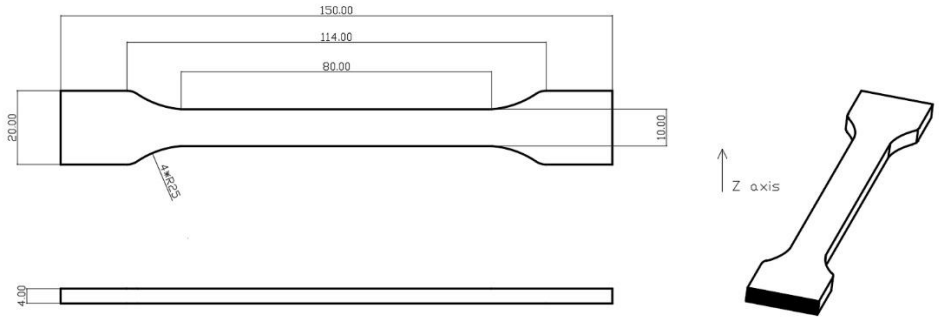
Other Physical and Chemical Properties	
Subjects	**Data**
Odor	Odorless
Composition	Polyphenylene sulfide (PPS), carbon fiber
Skin Hazards	No hazard
Chemical Stability	Stable under normal storage and handling conditions
Solubility	Insoluble in water
Resistance to Acid	Resistant
Resistance to Alkali	Resistant
Resistance to Organic Solvent	Resistant
Resistance to Oil and Grease	Resistant
Flammability	Self-extinguishing when away from fire; flame-retardant
Thermal Decomposition and Oxidation Products	Hydrocarbons, water, carbon oxides, sulfur dioxide, sulfides
Odor of Thermal Decomposition and Oxidation Products	Characterized odor

• Specimen Test

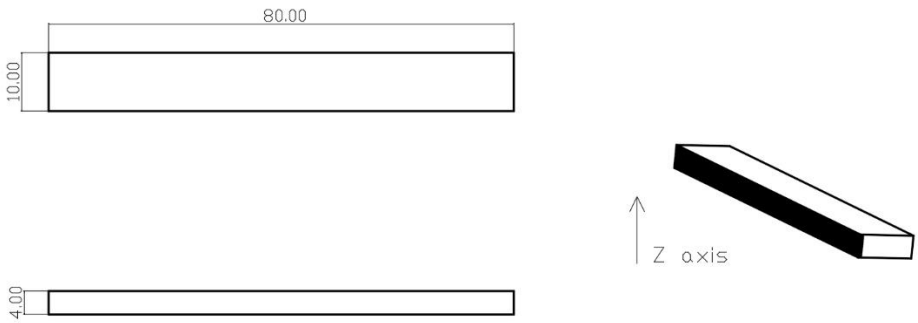
Specimen Printing Conditions	
Subjects	**Data**
Nozzle Temperature	320 °C
Bed Temperature	110 °C
Printing Speed	60mm/s
Infill Density	100%

**All the specimens were printed at the following settings: Printer = X1E, Chamber Temperature = 60 °C, Nozzle Temperature = 320 °C, Printing Speed = 60 mm/s, Bed Temperature = 110 °C, Infill Density = 100%. If higher chamber temperature and nozzle temperature were used (i.g., 90 °C and 335 °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 PPS-CF is 180 to 220 °C, and the time is 6 to 12 hours. The annealing effect depends on the annealing temperature, time and the print 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.*

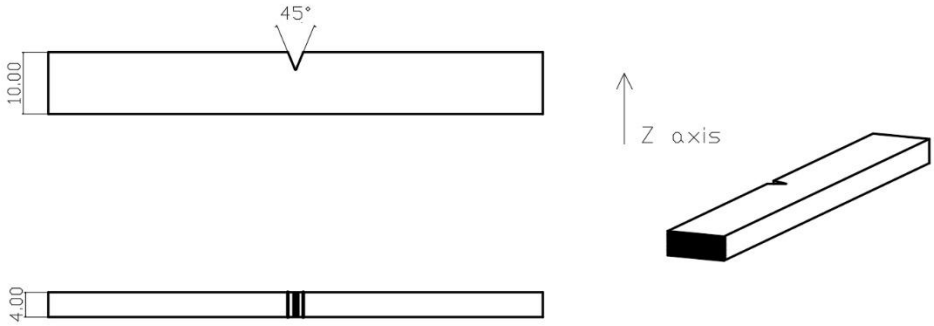
1. Tensile Testing



2. Bending Testing



3. Impact Testing



team@additive-x.com
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• 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.