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PLA-CF

Basic info

KINGROON PLA-CF is a custom-engineered tough PLA reinforced with carbon fiber, enhancing hardness and bending modulus while maintaining the easy printing and dimensional stability of standard PLA. The printed parts feature a matte, low-gloss finish with minimal visible layer lines—making it an excellent choice for functional prototypes and components that require a premium, non-glossy appearance.

Specifications

Subjects	Data
Diameter	1.75mm
Net Filaments Weight	1kg
Spool Material	ABS (Temperature resistance 70 °C)
Spool Size	Diameter: 200 mm; Height: 67 mm

Recommended Printing Settings

Subjects	Data
Drying Settings before Printing	Blast Drying Oven: 55 °C，8 h
Printing and Storage Humidity	< 20% RH (Sealed, with desiccant)
Nozzle Size	0.4, 0.6, 0.8 mm
Nozzle Temperature	210 - 240 °C
Bed Type	Cool Plate, High Temperature Plate or Textured PEI Plate
Bed Surface Preparation	Glue
Bed Temperature	35 - 45 °C
Cooling Fan	Turn on
Printing Speed	< 200mm/s
Retraction Length	0.6 - 1.0 mm
Retraction Speed	20 - 40 mm/s
Chamber Temperature	25- 45°C
Max Overhang Angle	55°
Max Bridging Length	30 mm
Support Material	Support for PLA

Properties

KINGROON has tested various aspects of PLA-CF material performance — including physical, mechanical, and chemical properties. The typical values are listed as follows:

Physical Properties		
Subjects	**Testing Methods**	**Data**
Density	ISO 1183	1.22 g/cm³

Melt Index	210°C,2.16kg	3.7 ± 0.6 g/10 min
Melting Temperature	DSC, 10 °C/min	165 °C
Glass Transition Temperature	DSC, 10 °C/min	63 °C
Crystallization Temperature	DSC, 10 °C/min	N/A
Vicar Softening Temperature	ISO 306, GB/T 1633	69 °C
Heat Deflection Temperature	ISO 75 1.8 Mpa	54 °C
Heat Deflection Temperature	ISO 75 0.45 Mpa	55 °C
Saturated Water Absorption Rate	25 °C, 55% RH	0.0042

Mechanical Properties		
Subjects	**Testing Methods**	**Data**
Young's Modulus(X-Y)	ISO 527, GB/T 1040	2790 ± 120 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	2160 ± 90 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	38 ± 4 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	26 ± 2 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	8.4 ± 3.2 %
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	3.6 ± 0.7 %
Bending Modulus (X-Y)	ISO 178, GB/T 9341	3950 ± 190 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	2260 ± 180 MPa
Bending Strength (X-Y)	ISO 178, GB/T 9341	89 ± 4 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	49 ± 3 MPa
Impact Strength (X-Y)	ISO 179, GB/T 1043	23.2 ± 3.7 kJ/m²; 7.6 ± 2.6 kJ/m²(notched)
Impact Strength (Z)	ISO 179, GB/T 1043	7.8 ± 0.7 kJ/m²

Other Physical and Chemical Properties

Subjects	**Data**
Odor	Odorless
Composition	Polylactic acid, carbon fiber
Skin Hazards	No hazard
Chemical Stability	Stable under normalstorage 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	Not resistant to some kinds of oil and grease
Flammability	Flammable
Combustion Products	Water, carbon oxides
Odor of Combustion Products	Pungent odor

Specimen Test

Specimen Printing Conditions	
Subjects	**Data**
Nozzle Temperature	230 °C
Bed Temperature	35°C
Printing Speed	180 mm/s
Infill Density	100%

All KINGROON PLA-CF test specimens were printed with the following settings: nozzle temperature 230 °C, printing speed 180 mm/s, bed temperature 35 °C, and 100% infill density. Before testing, all specimens were annealed and dried at 55 °C for 8 hours. For printed models, the recommended annealing conditions are 55–60 °C for 6–12 hours. The effectiveness of annealing depends on several factors, including temperature, duration, model size, structure, infill, and other printing parameters; some prints may warp or deform during the process. When drying filament or annealing printed parts, it is essential to use an oven with sufficient internal volume and even temperature distribution, such as a forced-air (blast drying) oven, and to keep all materials away from direct heat sources. Microwave ovens and kitchen ovens are not suitable, as uneven heating may damage both the filament and the printed models.