TECHNICAL DATA SHEET

V1.1

FIBERON By polymaker

FIBERON™ PA12-CF10

Fiberon™ PA12-CF10 is carbon fiber reinforced long chain copolyimide filament. Thanks to its chemical structure, this product has lower moisture sensitivity compared to PA6/66 and PA6-based materials, and better mechanical properties than PA12-based materials. In addition, the carbon fiber reinforcement and Warp-free™ technology enhance the size stability of the prints produced with this material.

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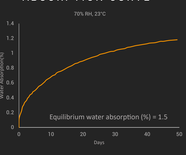
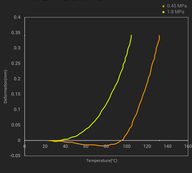
PHYSICAL PROPERTIES

PROPERTY	TESTING METHOD	TYPICAL VALUE
Density	ISO1183, GB/T1033	1.06 g/cm³ at 23°C
Melt index	280°C, 2.16 kg	25.0 g/10min
Flame retardancy	UL 94, 1.5mm	HB
Surface Resistivity (Ω)	ANSI ESD S11.11	OL, >10^{12} Ω

MOISTURE ABSORPTION CURVE



HDT CURVE



THERMAL PROPERTIES

PROPERTY	TESTING METHOD	TYPICAL VALUE
Glass transition temp.	DSC, 10°C/min	55 °C
Melting temperature	DSC, 10°C/min	171 °C
Crystallization temp.	DSC, 10°C/min	120 °C
Decomposition temp.	TGA, 20°C/min	445.2 °C
Vicat softening temp.	ISO 306, GB/T 1633	170.2 °C
Heat deflection temp.	ISO 75 1.8MPa	105 °C
Heat deflection temp.	ISO 75 0.45MPa	131 °C

MECHANICAL PROPERTIES - DRY STATUS

PROPERTY	TESTING METHOD	TYPICAL VALUE
Young's modulus (X-Y)	ISO 527, GB/T 1040	3311.2 ± 134.9 MPa
Young's modulus (Z)		1806.6 ± 145.7 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	77.4 ± 1.1 MPa
Tensile strength (Z)		52.2 ± 0.8 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	4.2 ± 0.4 %
Elongation at break (Z)		5.0 ± 1.0 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2886.5 ± 144.8 MPa
Bending modulus (Z)		1452.8 ± 96.5 MPa
Bending strength (X-Y)	ISO 178, GB/T 9341	112.4 ± 1.0 MPa
Bending strength (Z)		69.8 ± 2.2 MPa
Charpy impact strength (X-Y) notched	ISO 179，GB/T 1043	9.9 ± 0.7 kJ/m²
Charpy impact strength (X-Y)un-notched		33.7 ± 1.4 kJ/m²
Charpy impact strength (Z) un-notched		27.6 ± 3.7 kJ/m²

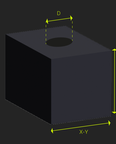
•All specimens were annealed at 100°C for 16h.

MECHANICAL PROPERTIES - WET STATUS

PROPERTY	TESTING METHOD	TYPICAL VALUE
Young's modulus (X-Y)	ISO 527, GB/T 1040	3131.7 ± 124.2 MPa
Young's modulus (Z)		1622.0 ± 71.7 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	71.7 ± 0.7 MPa
Tensile strength (Z)		42.1 ± 1.8 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	5.3 ± 0.3 %
Elongation at break (Z)		5.3 ± 1.2 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2652.7 ± 57.2 MPa
Bending modulus (Z)		1145.9 ± 76.9 MPa
Bending strength (X-Y)	ISO 178, GB/T 9341	91.8 ± 1.5 MPa
Bending strength (Z)		52.2 ± 1.5 MPa
Charpy impact strength (X-Y) notched	ISO 179，GB/T 1043	10.2 ± 0.8 kJ/m²
Charpy impact strength (X-Y)un-notched		41.2 ± 4.4 kJ/m²
Charpy impact strength (Z) un-notched		20.6 ± 4.7 kJ/m²

•All specimens were annealed at 100°C for 16h, and immerged in water at 60°C for 48h prior to testing. The average moisture content of specimens is 2.92%

SHRINKAGE TESTING



	MODEL SIZE	AFTER PRINTING	AFTER ANNEALING
X-Y	40mm	39.88mm	39.84mm
Z	40mm	39.79mm	39.48mm
Diameter	10mm	9.91mm	9.85mm

•Model infill 30%

RECOMMENDED PRINTING CONDITIONS

Nozzle temperature	280-300 °C
Build plate temperature	40-50 °C
Chamber temperature	Room Temp.
Cooling fan	OFF

Printing speed	Up to 300mm/s
Drying temp. and time	100 °C/10H
Annealing temp. and time	100 °C/16H

PolySupport™ for PA12
PolyDissolve™ S1

Recommended support material

NOTE

Abrasion of the brass nozzle happens frequently when printing Fiberon™ PA12-CF10. Normally, the life of a brass nozzle would be approximately 9h. A wear-resistance nozzle, such as hardened steel and ruby nozzle, is highly recommended to be used with Fiberon™ PA12-CF10.

Fiberon™ PA12-CF10 is sensitive to moisture and should always be stored and used under dry conditions (relative humidity below 20%).

If Fiberon™ PA12-CF10 is used as the support material for itself, please remove the support structure before excessive moisture absorption. Otherwise, the support structure can be permanently bonded to the model.

After the printing process, it is recommended to anneal the model in the oven at 100°C for 16 hours.

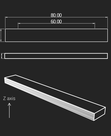
HOW TO MAKE SPECIMENS

Printing temperature	300 °C
Bed temperature	50 °C
Top & bottom layer	3

Infill	100%
Shell	2
Cooling fan	OFF

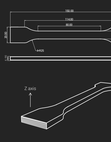
FLEXURAL TESTING SPECIMEN

ASTM D638 (ISO 527, GB/T 1040)



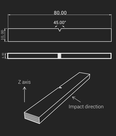
TENSILE TESTING SPECIMEN

ASTM D638 (ISO 527, GB/T 1040)



IMPACT TESTING SPECIMEN

ASTM D638 (ISO 179, GB/T 1043)



DISCLAIMER

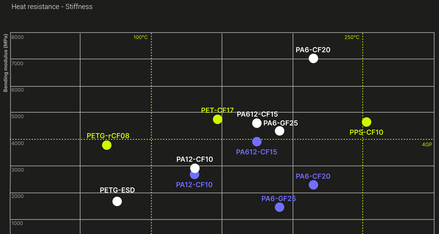
The typical values presented in this data sheet are intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. Actual values may vary significantly with printing conditions. End- use performance of printed parts depends not only on materials, but also on part design, environmental conditions, printing conditions, etc.

Product specifications are subject to change without notice. Each user is responsible for determining the safety, lawfulness, technical suitability, and disposal/recycling practices of Polymaker materials for the intended application. Polymaker makes no warranty of any kind, unless announced separately, to the fitness for any use or application. Polymaker shall not be made liable for any damage, injury or loss induced from the use of Polymaker materials in any application.

FIBERON

MATERIALS COMPARISON

Heat resistance - Stiffness



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