

TECHNICAL DATA SHEET

V1.1



By polymaker



FIBERON™ PA6-CF20

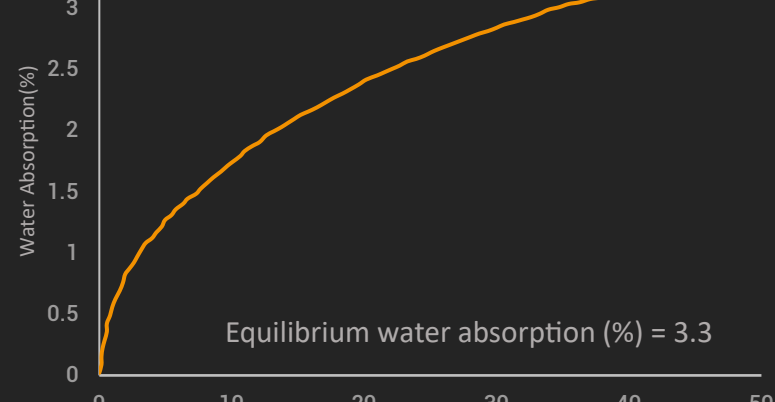
Fiberon™ PA6-CF20 is a carbon fiber reinforced PA6 (Nylon 6) filament. The carbon fiber reinforcement provides significantly improved stiffness, strength and heat resistance with outstanding layer adhesion.

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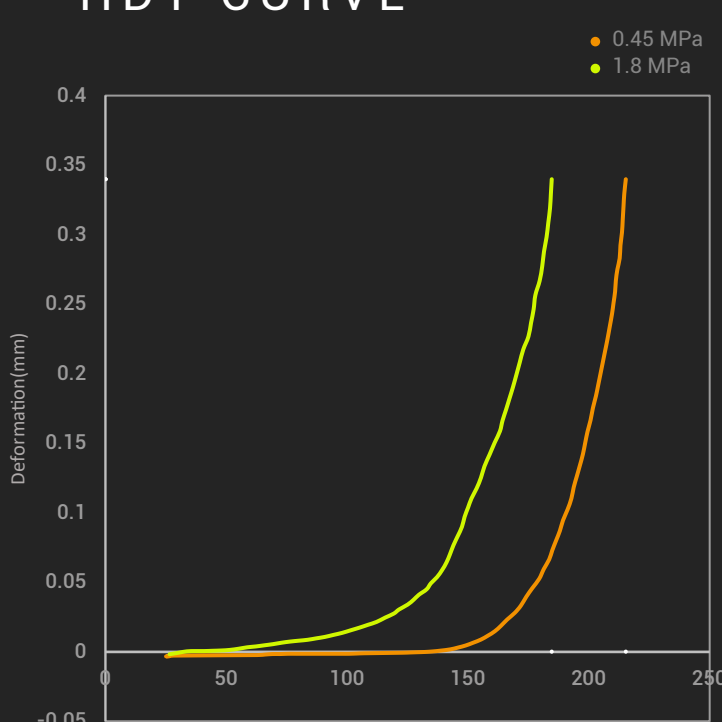
PHYSICAL PROPERTIES

PROPERTY	TESTING METHOD	TYPICAL VALUE
Density	ISO1183, GB/T1033	1.17 g/cm ³ at 23°C
Melt index	300°C, 2.16 kg	20.5 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	74.2 °C
Melting temperature	DSC, 10°C/min	218.5 °C
Crystallization temp.	DSC, 10°C/min	184.6 °C
Decomposition temp.	TGA, 20°C/min	446.2 °C
Vicat softening temp.	ISO 306, GB/T 1633	219.2 °C
Heat deflection temp.	ISO 75 1.8MPa	173 °C
Heat deflection temp.	ISO 75 0.45MPa	215 °C

MECHANICAL PROPERTIES - DRY STATUS

PROPERTY	TESTING METHOD	TYPICAL VALUE
Young's modulus (X-Y)	ISO 527, GB/T 1040	8636.5 ± 211.4 MPa
Young's modulus (Z)		3759.5 ± 118.5 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	109.3 ± 2.4 MPa
Tensile strength (Z)		54.0 ± 5.2 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	2.1 ± 0.2%
Elongation at break (Z)		1.9 ± 0.4%
Bending modulus (X-Y)	ISO 178, GB/T 9341	7037.6 ± 205.4 MPa
Bending modulus (Z)		2975.3 ± 174.3 MPa
Bending strength (X-Y)	ISO 178, GB/T 9341	161.0 ± 3.9 MPa
Bending strength (Z)		71.3 ± 17.7 MPa
Charpy impact strength (X-Y) notched	ISO 179, GB/T 1043	11.0 ± 0.3 kJ/m ²
Charpy impact strength (X-Y) un-notched		24.0 ± 1.0 kJ/m ²
Charpy impact strength (Z) un-notched		7.5 ± 2.7 kJ/m ²

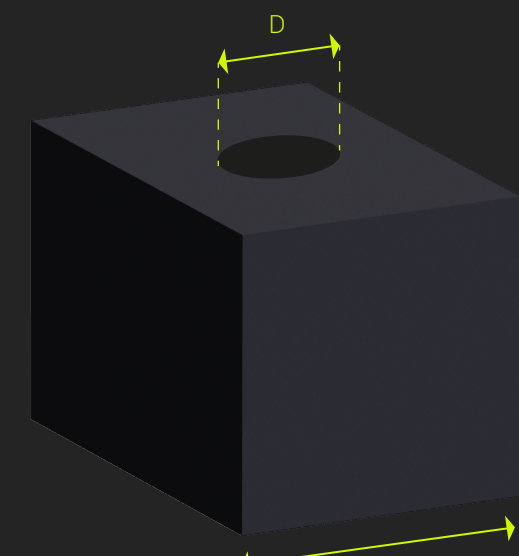
*All specimens were annealed at 100°C for 16h.

MECHANICAL PROPERTIES - WET STATUS

PROPERTY	TESTING METHOD	TYPICAL VALUE
Young's modulus (X-Y)	ISO 527, GB/T 1040	2508.1 ± 82.6 MPa
Young's modulus (Z)		1056.1 ± 127.9 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	54.7 ± 1.1 MPa
Tensile strength (Z)		25.5 ± 1.2 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	7.0 ± 0.9%
Elongation at break (Z)		6.7 ± 1.7%
Bending modulus (X-Y)	ISO 178, GB/T 9341	2286.2 ± 185.2 MPa
Bending modulus (Z)		801.1 ± 24.1 MPa
Bending strength (X-Y)	ISO 178, GB/T 9341	64.9 ± 4.9 MPa
Bending strength (Z)		29.2 ± 1.0 MPa
Charpy impact strength (X-Y) notched	ISO 179, GB/T 1043	35.6 ± 1.2 kJ/m ²
Charpy impact strength (X-Y) un-notched		73.0 ± 2.0 kJ/m ²
Charpy impact strength (Z) un-notched		25.2 ± 3.2 kJ/m ²

*All specimens were annealed at 100°C for 16h, and immersed in water at 60°C for 48h prior to testing. The average moisture content of specimens is 5.30%

SHRINKAGE TESTING



	MODEL SIZE	AFTER PRINTING	AFTER ANNEALING
X-Y	40mm	40.10mm	40.08mm
Z	40mm	39.90mm	39.86mm
Diameter	10mm	9.73mm	9.71mm

*Model infill 30%

RECOMMENDED PRINTING CONDITIONS

Nozzle temperature	280-300 °C	Printing speed	Up to 300mm/s
Build plate temperature	40-50 °C	Drying temp. and time	100 °C/10H
Chamber temperature	Room Temp.	Annealing temp. and time	100 °C/16H
Cooling fan	OFF		



PolyDissolve™ S1

Recommended support material

NOTE

Abrasion of the brass nozzle happens frequently when printing Fiberon™ PA6-CF20. 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™ PA6-CF20.

Fiberon™ PA6-CF20 is sensitive to moisture and should always be stored and used under dry conditions (relative humidity below 20%).

If Fiberon™ PA6-CF20 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.

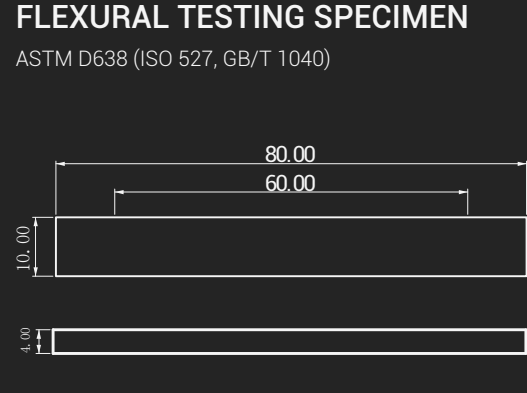
HOW TO MAKE SPECIMENS

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

Infill	100%
Shell	2
Cooling fan	OFF

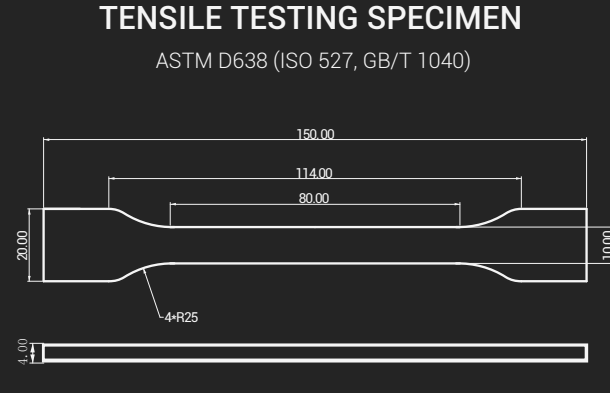
FLEXURAL TESTING SPECIMEN

ASTM D638 (ISO 527, GB/T 1040)



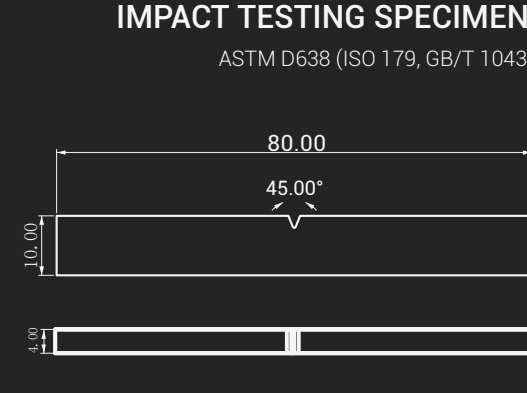
TENSILE TESTING SPECIMEN

ASTM D638 (ISO 527, GB/T 1040)



IMPACT TESTING SPECIMEN

ASTM D638 (ISO 179, GB/T 1043)



DISCLAIMER

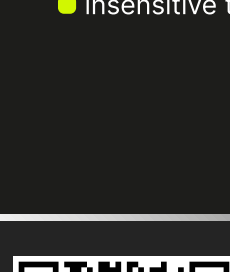
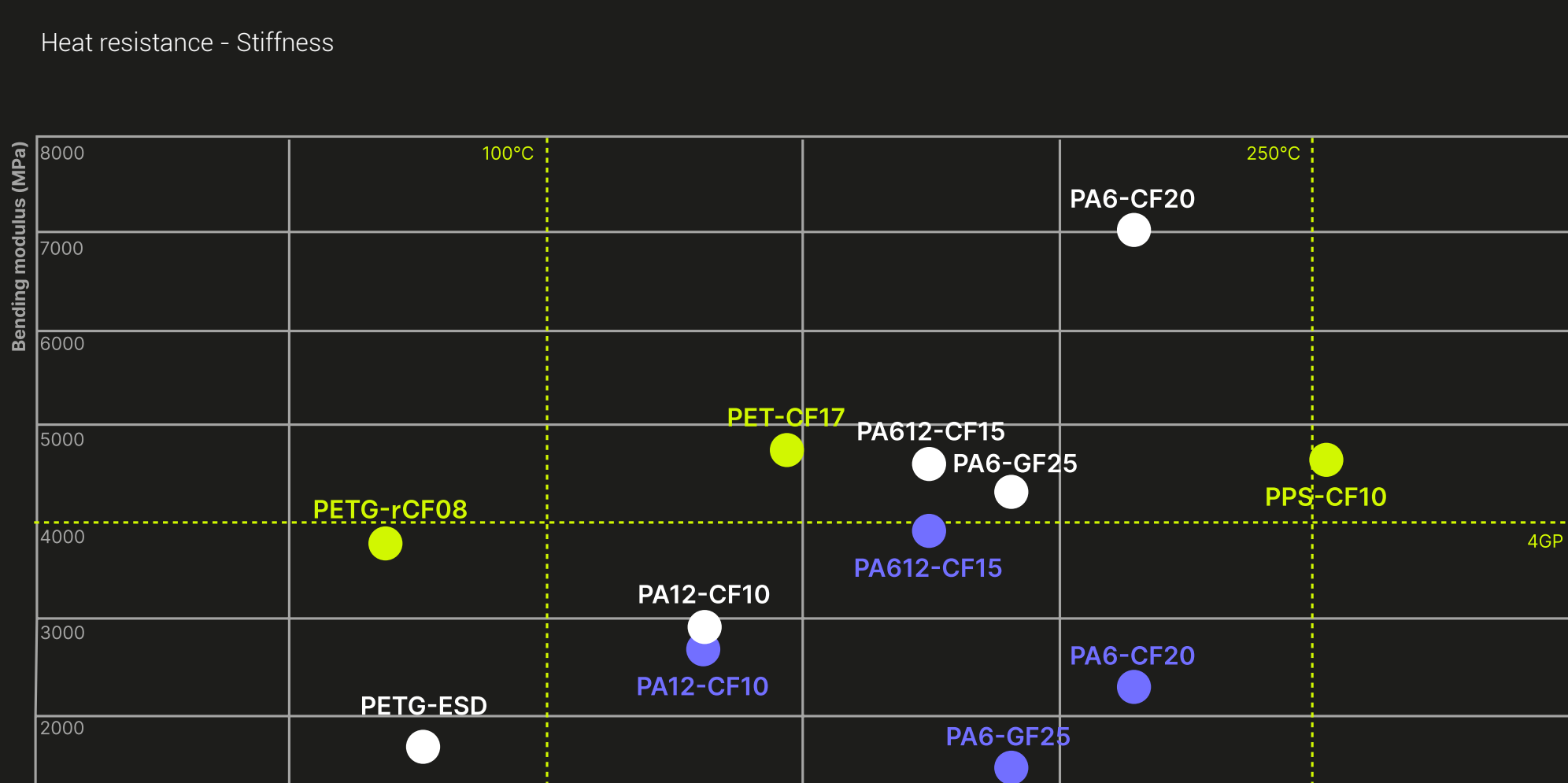
The typical values presented in this data sheet are intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. Actual values may vary significantly with printing conditions. End-use performance of printed parts depends not only 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 best of our knowledge 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.



MATERIALS COMPARISON

Heat resistance - Stiffness



FIBERON WEBSITE