

Technical Data Sheet (Ver. 1.0, last updated: Nov., 2020)

CFC PA is a non-filled Polyamide 12 developed by Polymaker for Anisoprint CFC (Continuous Fiber Co-extrusion) technology. The low viscosity of the plastic ensures better adhesion between the fiber layers, while the fast cooling and solidification rate helps to achieve better fiber placement. This low water absorption plastic can be printed without a dryer.

Physical Properties¹

Property	Testing Method	Typical Value
Density (g/cm ³ at 21.5 °C)	ASTM D792 (ISO 1183, GB/T 1033)	1.02
Melt index (g/10 min)	260 °C, 2.16 kg	15.2
Glass transition temperature (°C)	DSC, 10 °C/min	50
Melting temperature (°C)	DSC, 10 °C/min	167
Crystallization temperature (°C)	DSC, 10 °C/min	121

1. Tested with 3D printed specimen of 100% infill

Mechanical Properties¹

1. Dry State²

Property	Testing Method	Typical Value
Young's modulus (MPa) (X - Y)	ASTM D638 (ISO 527, GB/T 1040)	1580± 195
Tensile strength (MPa) (X - Y)	ASTM D638 (ISO527, GB/T 1040)	56.8 ± 0.53
Elongation at break (%) (X - Y)	ASTM D638 (ISO527, GB/T 1040)	15.86±2.41
Bending modulus (MPa) (X - Y)	ASTM D790 (ISO 178, GB/T 9341)	1580 ± 195
Bending strength (MPa) (X - Y)	ASTM D790 (ISO 178, GB/T 9341)	68.7 ± 1.8
Charpy Impact strength (kJ/m ²) (X - Y)	ASTM D256 (ISO 179, GB/T 1043)	11.42 ± 0.9

1. All testing specimens were printed under the following conditions:
Nozzle temperature = 260 °C, printing speed = 50 mm/s, chamber temperature = 40 °C

2. All specimens were annealed at 80 °C for 60 min and dried for 48h prior to testing

Recommended Printing Conditions¹

Parameter	Recommended Setting
Nozzle temperature (°C)	250 - 260
Recommended build surface	Glass, Garolite; apply PVA glue to the surface when needed
Build plate temperature (°C)	Room temperature - 50
Model cooling fan	Turned off
Printing speed (mm/s)	40 - 50
Raft separation distance (mm)	0.1 - 0.2
Retraction distance (mm)	3 - 6
Retraction speed (mm/s)	40 - 60
Recommended environmental temperature (°C)	Room temperature - 50
Threshold overhang angle (°)	60
Recommended support materials	SU301 (PI)

1. Based on 0.4 mm nozzle and Simplify 3D v.4.1.
Printing conditions may vary with different nozzle diameters

Appendix: Testing Geometries

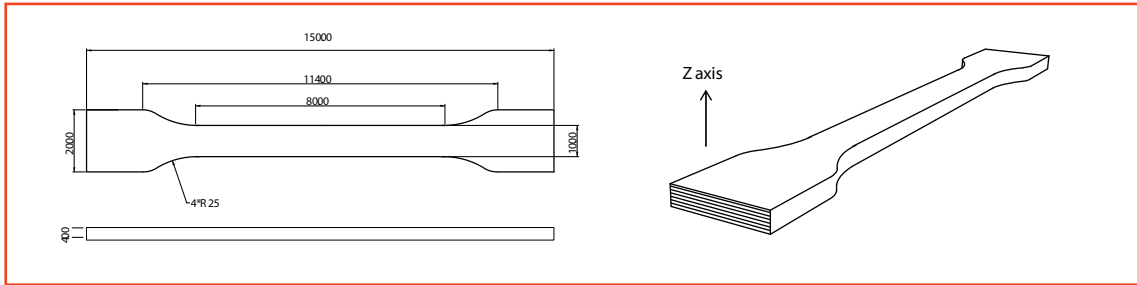


Fig 1.
Tensile testing
(X-Y) specimen

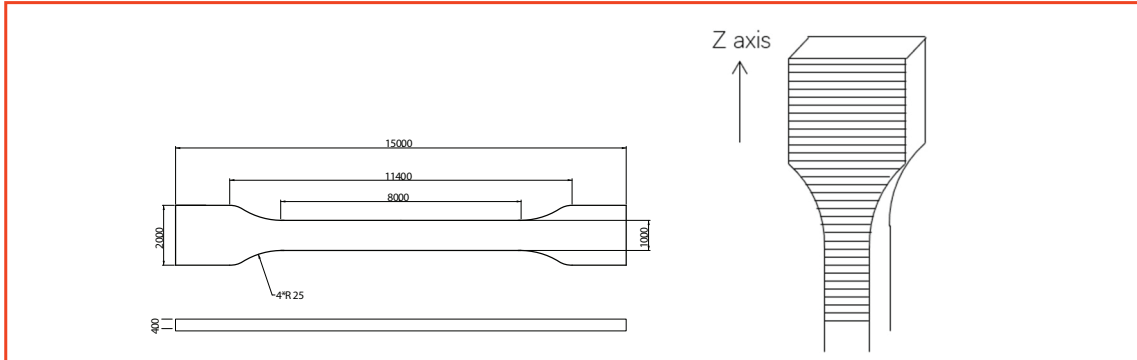


Fig 2.
Tensile testing
(Z) specimen

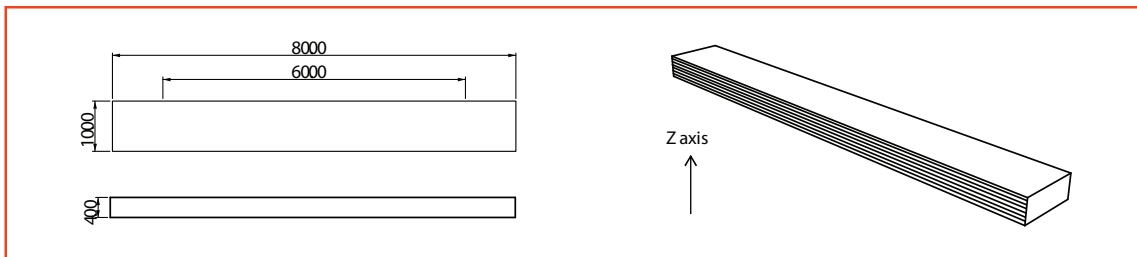


Fig 4.
Flexural testing
specimen

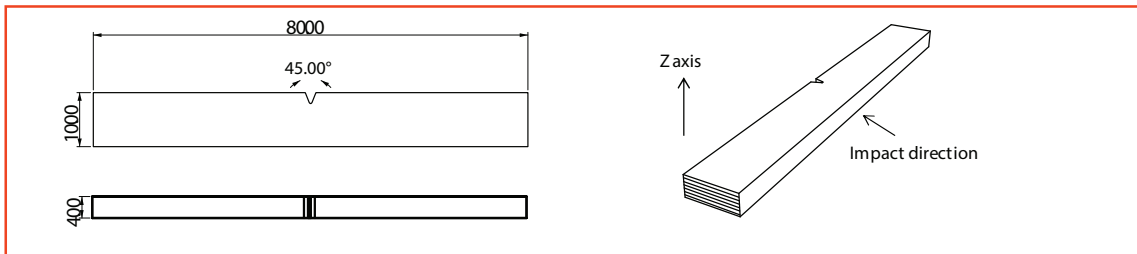


Fig 4.
Impact testing
specimen

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.

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