PolyCore™ PETG-1312

Technical Data Sheet (Ver. 2.0, last updated: Jun, 2025)

PolyCore™ PETG-1312 is a glass fiber reinforced (20% mass percent) PETG pellets featured with good heat resistance, good toughness and excellent printability. This pellet product is specially used in the domestic 3D printing sculpture industry.

Basic Properties

Property	Testing Method	Typical Value
Density (g/cm^3 at 21.5 °C)	ASTM D792 (ISO 1183, GB/T 1033)	1.38
Melt Index (g/10 min)	250 °C, 2.16 kg	21.6
Glass Transition Temperature (°C)	DSC, 10 °C/min	76.3
Vicat Softening temperature (°C)	ASTM D1525 (ISO 306 GB/T 1633)	138
Heat Deflection Temperature (°C)	ISO 75 1.8MPa 0.45MPa	70 75

Mechanical Properties[1]

Property	Testing Method	Typical Value
Young's modulus (MPa)	ASTM D638 (ISO 527, GB/T 1040)	4298 ±316
Tensile strength (MPa)	ASTM D638 (ISO527, GB/T 1040)	63.0 ± 0.8
Elongation at break (%)	ASTM D638 (ISO527, GB/T 1040)	6.6 ± 0.6
Bending modulus (MPa)	ASTM D790 (ISO 178, GB/T 9341)	4284 ± 102
Bending strength (MPa)	ASTM D790 (ISO 178, GB/T 9341)	104.0 ± 1.5
Charpy Impact strength (kJ/m^2)	ASTM D256 (ISO 179, GB/T 1043)	45.9 ± 4.1
Charpy Impact strength (kJ/m^2)-notched	ASTM D256 (ISO 179, GB/T 1043)	9.9 ± 1.4

1. Tested with injection molding specimens

Mechanical Properties[1]

Property	Testing Method	Typical Value
Young's modulus (MPa) (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	6558 ± 743

Tensile strength (MPa) (X-Y)	ASTM D638 (ISO527, GB/T 1040)	80.6 ± 2.5
Elongation at break (%) (X-Y)	ASTM D638 (ISO527, GB/T 1040)	3.2 ± 0.7
Bending modulus (MPa) (X-Y)	ASTM D790 (ISO 178, GB/T 9341)	7449 ± 564
Bending strength (MPa) (X-Y)	ASTM D790 (ISO 178, GB/T 9341)	148.4 ± 9.1
Charpy Impact strength (kJ/m^2) (X-Y)	ASTM D256 (ISO 179, GB/T 1043)	26.3 ± 1.2
Charpy Impact strength (kJ/m^2) (X-Y)-notched	ASTM D256 (ISO 179, GB/T 1043)	8.4 ± 0.7
Young's modulus (MPa) (Z)	ASTM D638 (ISO 527, GB/T 1040)	3428 ± 341
Tensile strength (MPa) (Z)	ASTM D638 (ISO527, GB/T 1040)	44.5 ± 3.0
Elongation at break (%) (Z)	ASTM D638 (ISO527, GB/T 1040)	1.6 ± 0.2
Bending modulus (MPa) (Z)	ASTM D790 (ISO 178, GB/T 9341)	3597 ± 261
Bending strength (MPa) (Z)	ASTM D790 (ISO 178, GB/T 9341)	65.5 ± 1.2
Charpy Impact strength (kJ/m^2) (Z)	ASTM D256 (ISO 179, GB/T 1043)	9.9 ± 0.7

1. Tested with the specimens printed under following conditions:
Nozzle temperature: Zone1= 200 °C, Zone2= 240 °C,
Nozzle diameter=4mm, Layer width = 4mm, Layer height = 2mm, Layer time = 40s,
Room temperature = 15°C ,100% solid specimens.

Recommended Printing Conditions

Parameter	Recommended Setting
Drying temperature (°C)	60 - 65
Drying Time (h)	6 - 8
Barrel temperature (°C)	200 - 210
Nozzle temperature (°C)	220 - 250
Bed temperature (°C)	Room temperature - 50
Other Comments	
● It is recommended to stop feeding and continue extruding until the extruder is fully empty, if the printing stops in a short term, such as 10-30 min.	

- It is recommended to stop feeding and continue extruding until the extruder is fully empty, then use polyethylene (PE) to clean the extruder, if the printing stop in a long term, such as several hours. It is helpful to avoid the carbonization of material and keep extruder working in a good condition

Recommended Printing Parameters

	Tr = 40℃ Width=5mm Height=2mm	Tr =40℃ Width=2mm Height=1mm	Tr = 25℃ Width=5mm Height=2mm	Tr = 25℃ Width=2mm Height=1mm	Tr = 10℃ Width=5mm Height=2mm	Tr = 10℃ Width=2mm Height=1mm
Thermal index	Layer Time (s)	Layer Time (s)	Layer Time (s)	Layer Time (s)	Layer Time (s)	Layer Time (s)
0.25	21	9	18	7	14	5
0.33	27	12	21	9	17	7
0.43	36	16	27	12	20	9
0.57	48	20	35	15	25	11
0.76	64	27	47	20	33	14
1.00	87	37	62	26	44	19
0.76	119	50	84	35	59	25
0.57	165	69	114	48	80	34
0.43	231	96	157	65	109	45
0.33	339	141	217	90	148	62
0.25	550	229	315	130	204	86

1：Definition of each concept
- Layer time: the time spent for depositing one layer of the printed part.
- Thermal index: A metric describing the quality of printing process. A value of 1 represents the optimal process, and deviations from 1 indicate suboptimal printing conditions
- Width: the cross-sectional dimension of the printed layer, perpendicular to the direction of the print nozzle's movement.
- Height: the vertical dimension of the printed object, or the layer thickness during pellet printing.
- Tr: room temperature when starting pellet printing.

2：Above data is inferred based on a melt temperature of 240 °C at nozzle exit and a 0.8 m*0.8 m*0.8 m square frame model.

3：The simulation condition is based on a closed room without additional air disturbances, and assumes some environment temperature increasement.

4：Above data is inferred based on the thermal history simulation software, Dragon, by Helio Additive. It should be used for reference only. For a more detailed analysis, please contact Polymaker.

We recommend using the layer times within the green-highlighted range (i.e., where the thermal index approaches 1) for printing. Different printing parameters correspond to different optimal layer time ranges.

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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