Raise3D Hyper Core PPA GF25 Technical Data Sheet

The Hyper Core family is the new-generation of professional and industrial fiber-reinforced composite filament line for Hyper FFF™. The innovative extrusion technology contributes to form a fiber-rich inner core where most of the glass fiber (25 wt.%) are well-aligned and distributed. As a result, Hyper Core PPA GF25 offers not only higher Z-direction strength, smoother surface quality, but also, and above all, higher performance-cost ratio and a wide range of color options. It's suitable for applications such as automotive parts, jigs & fixtures, as well as for insulating housings, etc.

General Properties

Property	Testing Method	Typical Value
Density (g/cm³)	ISO 1183, GB/T 1033	1.29
Water absorption (%)	ISO 62: Method 1	1.40
Diameter (mm)	/	1.75
Net weight (kg)	/	1.0
Color	/	White
Odor	/	Almost odorless
Solubility	/	Insoluble in water

Mechanical Properties (Conditioned, after annealed) [1]

Property	Testing Method	Typical Value (XY, Flat)
Young's modulus (MPa)	ISO 527	5730 ±30 2
Tensile strength (MPa)	ISO 527	105 ± 2
Elongation at break (%)	ISO 527	2.41 ±0.05
Bending modulus (MPa)	ISO 178	5958 ±9 6
Bending strength (MPa)	ISO 178	168 ± 5
Charpy impact strength (kJ/m²)	ISO 179	7.59 ±0.8 0

[1]All testing specimens were printed under the following conditions:
Nozzle temp. = 340 ℃; Bed temp.= 80 ℃; Print speed= 45 mm/s; Infill= 100%; Infill angle= ±45 °
All specimens were annealed at 100 ℃ for 8h.

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Mechanical Properties (Conditioned, before annealed)[2]

Property	Testing Method	Typical Value (XY, Flat)	Typical Value (ZX, Upright)
Young's modulus (MPa)	ISO 527	5401 ±2 27	4151 ±80
Tensile strength (MPa)	ISO 527	97 ± 2	65 ±3
Elongation at break (%)	ISO 527	2.92 ±0.13	1.90 ±0.15
Bending modulus (MPa)	ISO 178	5403 ±123	/
Bending strength (MPa)	ISO 178	162 ±3	/
Charpy impact strength (kJ/m²)	ISO 179	12.55 ±0.86	/

[2]All testing specimens were printed under the following conditions:
Nozzle temp.= 340 ℃; Bed temp. = 80 ℃; Print speed = 45 mm/s; Infill= 100 %; Infill angle= ±45 °

Thermal Properties

Property	Testing Method	Typical Value
Melt flow index (g/10 min)	300 ℃, 2.16 kg	5.5
Heat distortion temperature[3] (℃)	ISO 75 @0.45 MPa	196
	ISO 75 @1.8 MPa	118

[3]The specimens of HDT test were annealed at 100 ℃ for 8h.

Other Information

Color	Color Code
White	RAL 1013

Note:

1. Abrasion of the brass nozzle happens frequently when printing Hyper Core PPA GF25. Using abrasion resistance nozzle, as hardened steel and above grade nozzle is highly recommended.
2. Please dry the filament for a long time, at least 8 hours at 80-100℃ or more to get the full print quality of Raise3D Hyper Core PPA GF25.
3. After drying, we recommend storing the filament into Raise3D Filament Dry Box during the printing.
4. If this filament is used as the support material for itself, please remove the support structure after annealing. Otherwise, the support structure could be permanently bonded to the model after moisture absorption.

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Testing Geometries

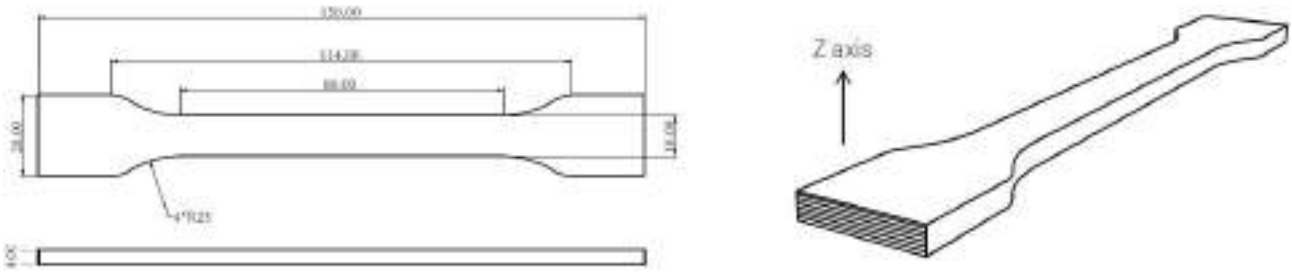

Fig 1. Tensile testing specimen

Fig 2. Flexural testing specimen

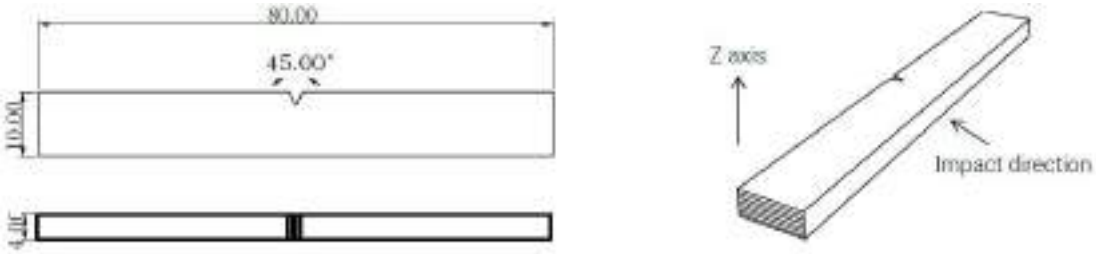

Fig 3. Impact testing specimen

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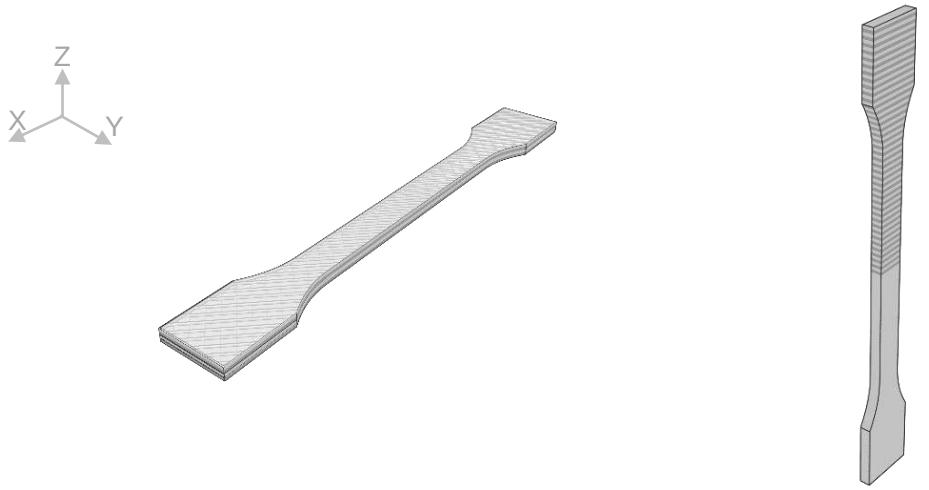

Fig 4. *Print Orientation*

Fused filament fabrication (FFF)/fused deposition modeling is a layer-by-layer process allows thermoplastic to be printed in various orientations relative to the print direction. Due to anisotropy, the performance has a gap between the different orientation.

Note: All samples are printed with 100% infill; the lines in the Fig 4. indicate typical directionality of infill and walls in a printed part.

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 Raise3D materials for the intended application. Raise3D makes no warranty of any kind, unless announced separately, to the fitness for any particular use or application.

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