

Raise3D Hyper Core ABS CF15 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 carbon fiber (15 wt.%) are well-aligned and distributed. During high speed printing, Hyper Core ABS CF15 inherits excellent impact toughness, good chemical resistance and low moisture absorption of terpolymer ABS matrix, moreover special fiber-distribution improves the Z-direction strength, stiffness as well as the nozzle lifetime. It is ideal choice for volume production of industrial grade applications where high performance, stability and efficiency are required.

General Properties

Property	Testing Method	Typical Value
Density (g/cm³)	ISO 1183, GB/T 1033	1.09
Water absorption (%)	ISO 62: Method 1	0.28
Diameter (mm)	/	1.75
Net weight (kg)	/	1.0
Color	/	Black
Odor	/	Almost odorless
Solubility	/	Insoluble in water

Mechanical Properties¹

Property	Testing Method	Typical Value (XY, Flat)	Typical Value (ZX, Upright)
Young's modulus (MPa)	ISO 527	4606 ± 192	2714 ± 88
Tensile strength (MPa)	ISO 527	48 ± 3	28 ± 1
Elongation at break (%)	ISO 527	1.48 ± 0.11	1.81 ± 0.16
Bending modulus (MPa)	ISO 178	4365 ± 154	/
Bending strength (MPa)	ISO 178	80 ± 1	/
Charpy impact strength (kJ/m²)	ISO 179	8.12 ± 0.78	/

¹All testing specimens were printed under the following conditions:

Nozzle temp.= 250 °C; Bed temp.= 100 °C; Print speed= 50 mm/s; Infill= 100 %; Infill angle= ±45 °.

Thermal Properties

Property	Testing Method	Typical Value
Melt flow index (g/10 min)	250 °C, 2.16 kg	5.5
Heat distortion temperature ³ (°C)	ISO 75 @0.45 MPa	90
	ISO 75 @1.8 MPa	83

Other Information

Color	Color Code
Black	RAL 7024

Note:

1. Abrasion of the brass nozzle happens frequently when printing Hyper Core ABS CF15. Using abrasion resistance nozzle, as hardened steel and above grade nozzle is highly recommended.
2. Please dry the filament at 60 - 70 °C for 6 - 8 hours to restore the printing quality of Raise3D Hyper Core ABS CF15.
3. Please print in a well-ventilated environment.

Testing Geometries

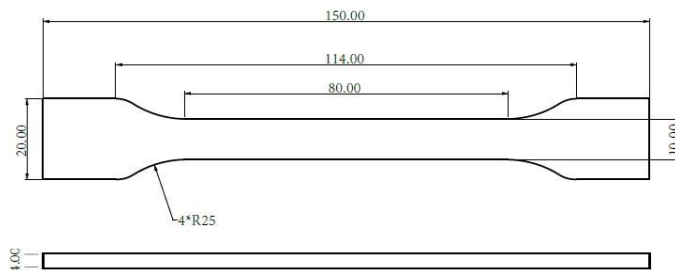


Fig 1. Tensile testing specimen

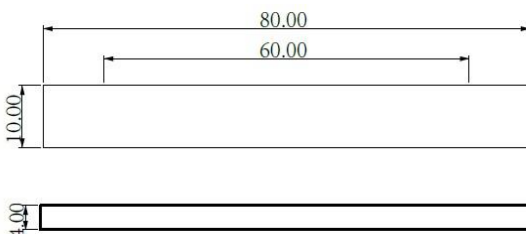
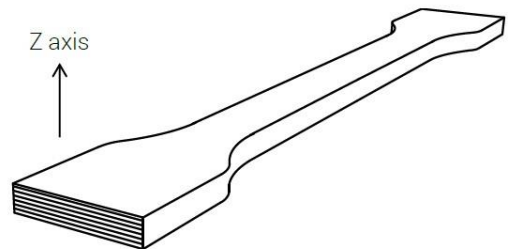
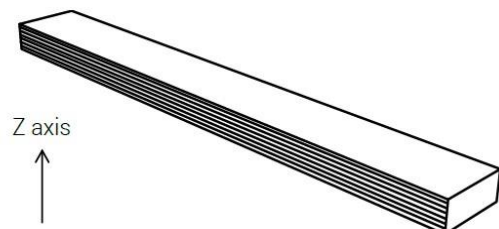


Fig 2. Flexural testing specimen



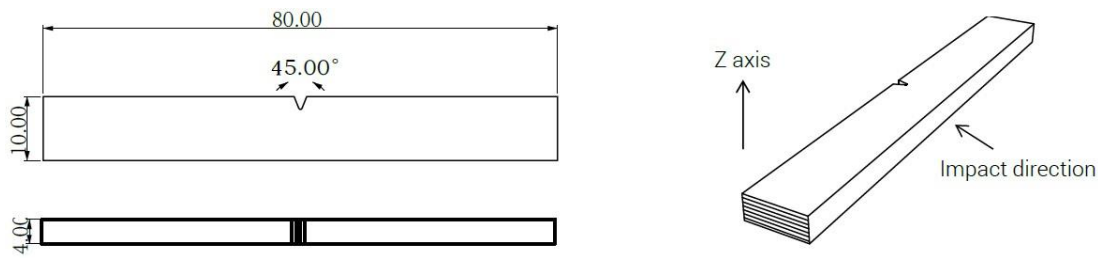


Fig 3. Impact testing specimen

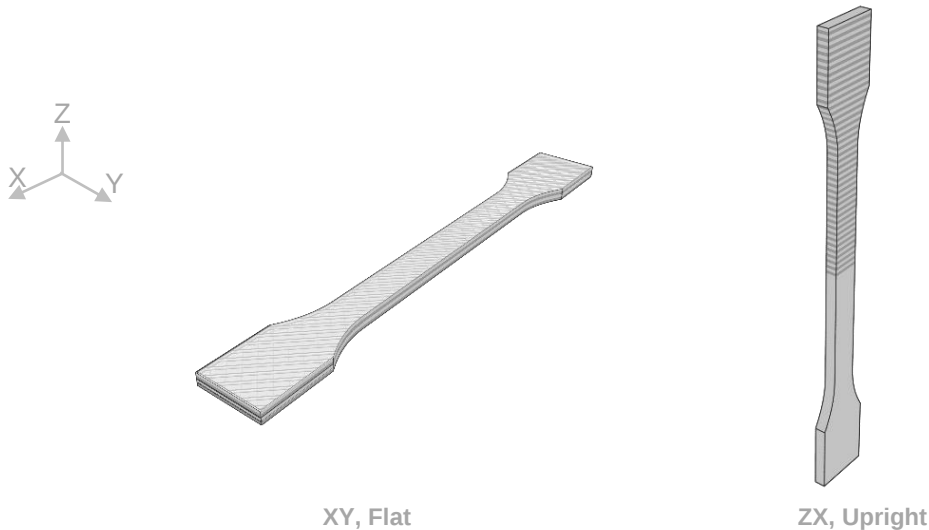


Fig 4. Print Orientation

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. Raise3D shall not be made liable for any damage, injury or loss induced from the use of Raise3D materials in any particular application.