Raise3D Hyper Speed PLA Pro Technical Data Sheet

Raise3D Hyper Speed PLA Pro is a composite filament specially designed for the Hyper FFF®. The addition of carbon powder and other additives enhances the matte finish surface, and after using the ironing function, the surface smoothness can be significantly improved. Additionally, while the interlayer adhesion is slightly lower than Premium PLA, the material outperforms Premium PLA in terms of rigidity, tensile strength, and impact resistance. This material is ideal for rapid prototyping and the rapid production of small exterior parts without the need for molds.

General Properties

Property	Testing Method	Typical Value
Density (g/cm³)	ISO 1183, GB/T 1033	1.21
Water absorption (%)	ISO 62: Method 1	0.45
Diameter (mm)	/	1.75
Net weight (kg)	/	1.0
Color	/	Black, Dark Blue, Brick Red, Dark Green
Odor	/	Almost odorless
Solubility	/	Insoluble in water
Flame retardancy	UL94, 1.5mm	HB
Surface resistivity (Ω)	ANSI ESD S11.11	OL, $>10^{12}$

Mechanical Properties (Conditioned, before annealed)[1]

Property	Testing Method	Typical Value (XY, Flat)	Typical Value (ZX, Upright)
Young's modulus (MPa)	ISO 527	3100 ± 100	2200 ± 150
Tensile strength (MPa)	ISO 527	37.5 ± 3.5	20.5 ± 4.5
Elongation at break (%)	ISO 527	16.0 ± 8.0	3.0 ± 1.5
Bending modulus (MPa)	ISO 178	3050 ± 150	2000 ± 200
Bending strength (MPa)	ISO 178	68.5 ± 2.5	45.5 ± 3.5
Charpy impact strength (kJ/m²)	ISO 179	15.5 ± 4.5	5.0 ± 2.0

[1]All testing specimens were printed under the following conditions:
Nozzle temp.= 230 ºC; Bed temp.= 55 ºC; Print speed= 150 mm/s; Infill= 100 %; Infill angle= ±45 °.

Thermal Properties

Property	Testing Method	Typical Value
Melt flow index (g/10 min)	190 °C, 2.16 kg	4.0 - 6.5
Heat distortion temperature[2] (°C)	ISO 75 @0.45 MPa	60.0 ± 2.0
	ISO 75 @1.8 MPa	56.8 ± 2.0

[2]All testing specimens were printed under the following conditions:
Nozzle temp.= 230 ºC; Bed temp.= 55 ºC; Print speed= 150 mm/s; Infill= 100 %; Infill angle= ±45 °.

Other Information

Color	Reference Color Code
Black	-
Dark Blue	295U
Brick Red	7610C
Dark Green	7722U

Note:
1. Abrasion of the brass nozzle happens frequently when printing Hyper Speed PLA Pro. Using abrasion resistance nozzle, such as hardened steel and above grade nozzle is highly recommended.
2. Please dry the filament at 50 - 60 ºC for 6 - 12 hours to restore the printing quality of Raise3D Hyper Speed PLA Pro.
3. After drying, we recommend storing the filament into Raise3D Filament Dry Box during the printing.
4. It is recommended to put the Hyper Speed PLA Pro that will not be used in the short term back into the original packaging bag and seal it for storage.

Testing Geometries

RAISE3D
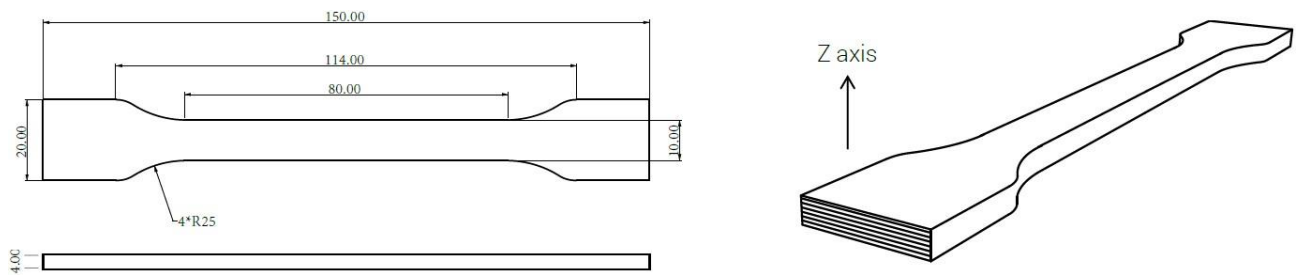
Fig 1. *Tensile testing specimen*
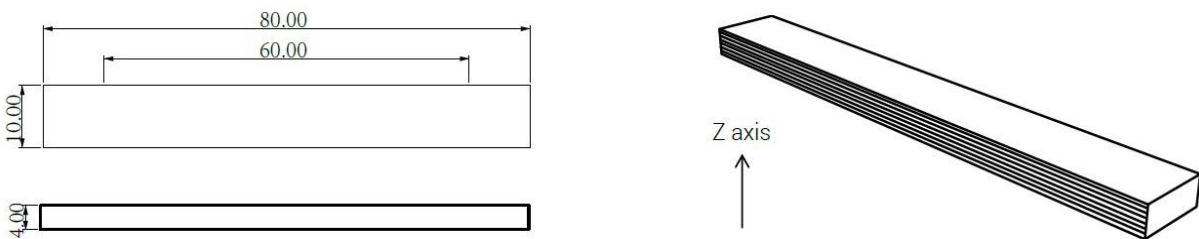
Fig 2. *Flexural testing specimen*
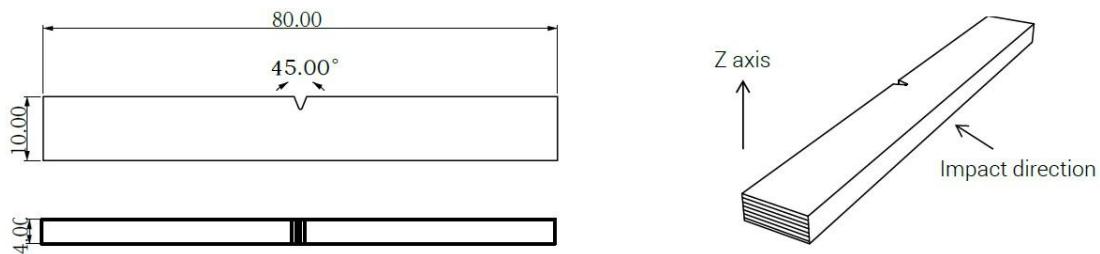
Fig 3. *Impact testing specimen*

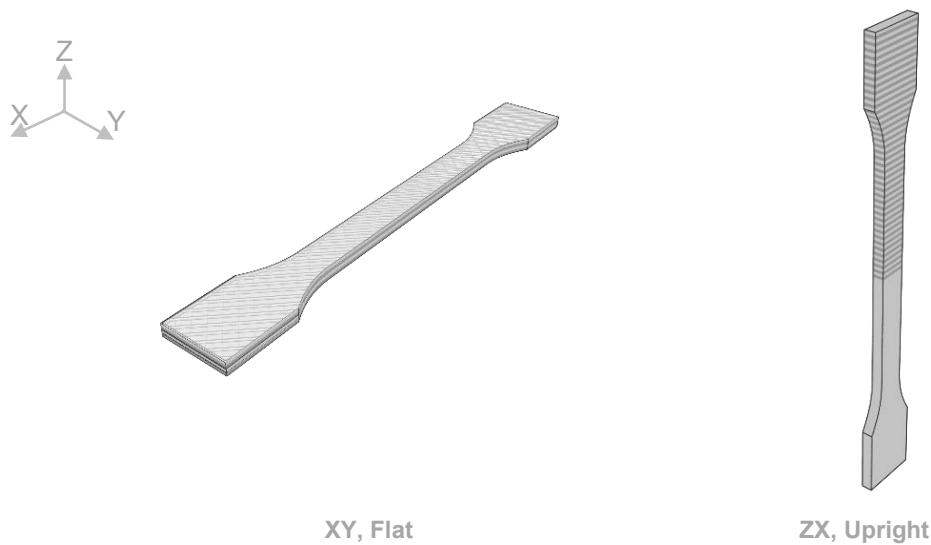**XY, Flat**   **ZX, Upright**

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.