

Raise3D Hyper Speed PLA Technical Data Sheet

Hyper Speed PLA filament is specifically designed to be used with the Hyper FFF™ solution from the Hyper speed filament line. With optimized molecular weight and tuned flowability, Raise3D Hyper Speed PLA is capable of printing at the speed of up to 300 mm/s thanks to its faster melting and much quicker cooling. As a result, it delivers excellent surface quality and detailed model structures. The mechanical properties of Hyper Speed PLA outperform regular PLA under high-speed printing, significantly improving the interlayer bonding quality and impact resistance. Its outstanding printability allows easy printing of large-sized models with high dimensional accuracy at high speeds. Therefore, Hyper speed PLA meets the general performance needs of various applications for Hyper FFF™ solution, including prototyping, models, props, jigs and fixtures combining. Hyper Speed PLA is made from renewable resources and comes in different colors.

General Properties

| Property | Testing Method | Typical Value |
|------------------------------|---------------------|---|
| Density (g/cm ³) | ISO 1183, GB/T 1033 | 1.21 |
| Water absorption (%) | ISO 62: Method 1 | 0.4 |
| Diameter (mm) | / | 1.75 |
| Net weight (kg) | / | 1.0 |
| Color | / | Black, White, Grey, Orange, Red, Blue, Yellow |
| Odor | / | Almost odorless |
| Solubility | / | Insoluble in water |

Mechanical Properties

| Property | Testing Method | Typical Value (XY, Flat) | Typical Value (ZX, Upright) |
|---|--------------------|--------------------------|-----------------------------|
| Young's modulus (MPa) | ISO 527, GB/T 1040 | 2600 ± 215 | 2475 ± 234 |
| Tensile strength (MPa) | ISO 527, GB/T 1040 | 48 ± 7 | 39 ± 4 |
| Elongation at break (%) | ISO 527, GB/T 1040 | 9.6 ± 0.8 | 3.8 ± 1.4 |
| Bending modulus (MPa) | ISO 178, GB/T 9341 | 2700 ± 154 | / |
| Bending strength (MPa) | ISO 178, GB/T 9341 | 81 ± 2 | / |
| Izod impact strength (kJ/m ²) | ISO 180, GB/T 1843 | 4.3 ± 1.3 | / |

Note:

All testing specimens were printed under the following conditions:

Nozzle diameter = 0.4 mm, nozzle temperature = 220 °C, printing speed = 200 mm/s, build plate temperature = 60 °C, infill = 100%

All specimens were conditioned at room temperature for 24 h prior to testing.

Thermal Properties

| Property | Testing Method | Typical Value |
|----------------------------------|-----------------|---------------|
| Melt flow index (g/10 min) | 190 °C, 2.16 kg | 4.5 |
| Heat distortion temperature (°C) | ISO 75@0.45 MPa | 58 |
| | ISO 75@1.8 MPa | 55 |

Other Information

| Color | Color Code |
|--------|------------|
| Black | RAL 9011 |
| White | RAL 9016 |
| Grey | RAL 7045 |
| Orange | RAL 2001 |
| Red | RAL 3028 |
| Blue | RAL 5010 |
| Yellow | RAL 1023 |

Testing Geometries

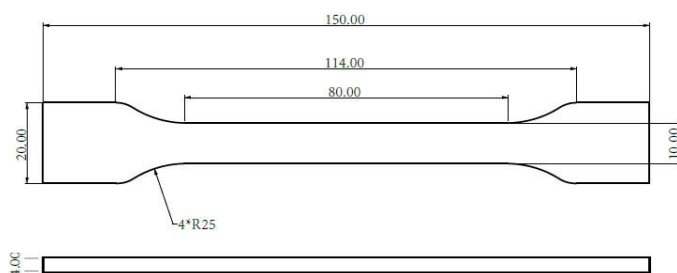


Fig 1. Tensile testing specimen

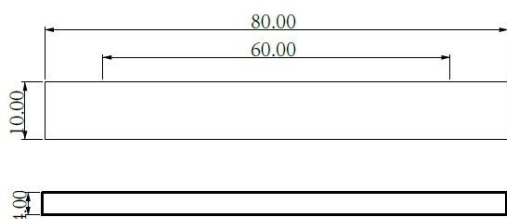
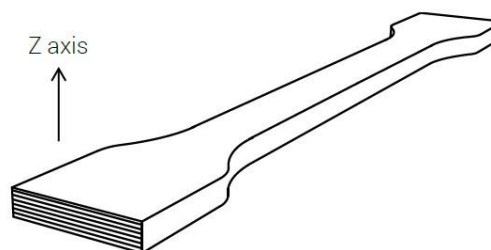
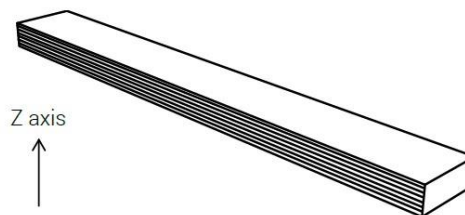


Fig 2. Flexural testing specimen



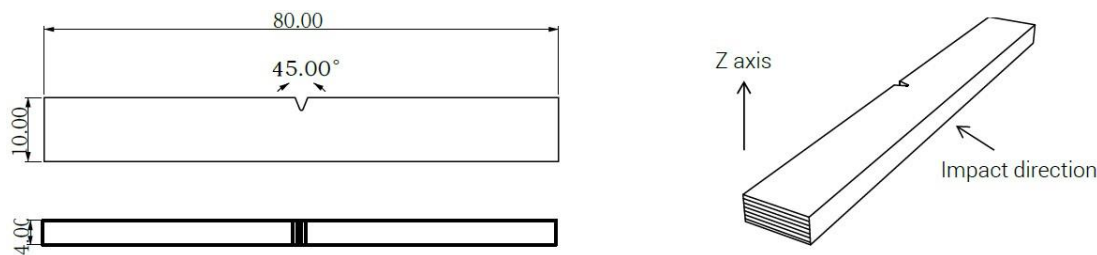


Fig 3. Impact testing specimen

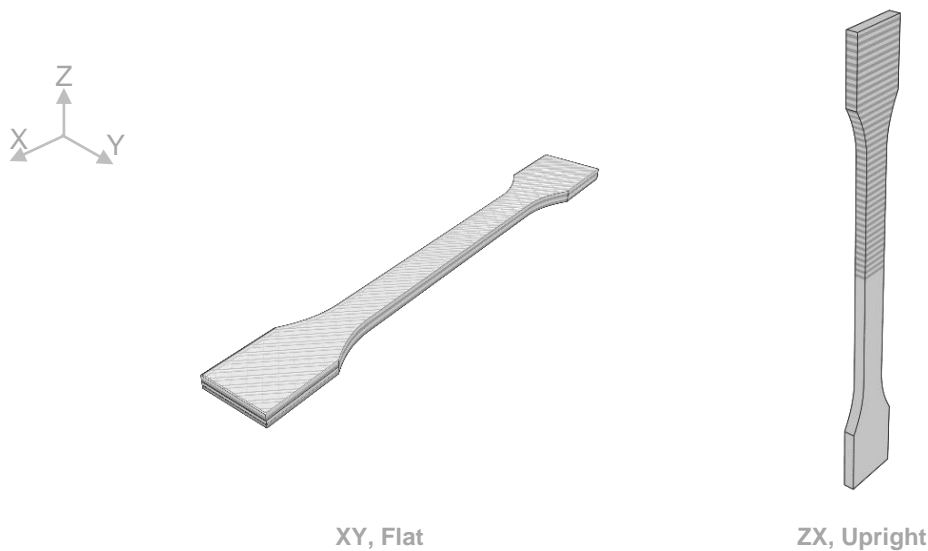


Fig 4. Print Orientation

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. Enduse 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.