Raise3D Industrial PPA CF Technical Data Sheet

Raise3D Industrial PPA CF Filament is carbon fiber reinforced composite filament material based on PPA (polyphthalamide or high-performance/high-temperature Nylon). Thanks to its high-performance Nylon matrix, this composite filament has superior mechanical properties than other Nylon filaments. With well controlled dispersion and length distribution of chopped carbon fibers (15 wt.%), the PPA CF has lower density, lower moisture absorption, high strength and rigidity, high wear and creep resistance, excellent chemical and heat resistance. It is promising for end-use applications in automotive, aerospace, electrical and electronics (E&E) industry.

Filament Specifications

Property	Testing Method	Typical Value
Density (g/cm^3 at 21.5°C)	ISO 1183	1.15
Heat Deflection Temperature (°C)	ISO75 1.8 MPa	113
	ISO75 0.45 MPa	188
Melting Temperature (°C)	ISO 11357	231
Melt index (g/10 min)	280°C, 2.16 kg	11
Moisture content (%)	ISO 62: Method 1	0.6
Odor	/	Almost odorless
Solubility	/	Insoluble in water

Mechanical Properties (Conditioned)

Property	Testing Method	Typical value
Young's modulus (X-Y)	ISO 527	7800 ± 520 MPa
Tensile strength (X-Y)	ISO 527	122 ± 4 MPa
Elongation at break (X-Y)	ISO 527	1.9 ± 0.1%
Mono-layer Z-axis tensile strength	Custom method	30.2 ± 1.4 MPa
Bending modulus (X-Y)	ISO 178	8510 ± 240 MPa
Bending strength (X-Y)	ISO 178	190 ± 20 MPa
Charpy impact strength (X-Y)	ISO 179	7.8 ± 1.0 kJ/m^2

All specimens were annealed at 100°C for 8h, and immerged in ambient temperature for 3 days prior to testing.

Note:

1. Abrasion of the brass nozzle happens frequently when printing PPA CF. Using abrasion resistance nozzle, as hardened steel and above grade nozzle is highly recommended.

2. Please dry the filament at 80-100°C for 6-12 hours to restore the printing quality of Raise3D Industrial PPA CF.

3. After drying, we recommend to store PPA CF filament into Raise3D Filament Dry Box during the printing.

4. After the printing, it is recommended to anneal the printed part at 80-100°C for 8 hours.

5. After annealing, max. 0.5% dimensional shrinkage could be observed in Z-axis depending on infill and layer height, no obvious dimensional shrinkage in XY-axis.

6. If PPA CF 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.

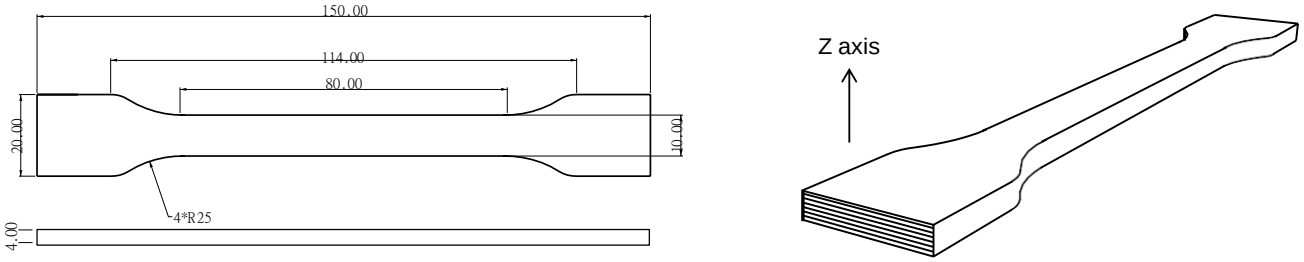

Fig 1. Tensile testing specimen

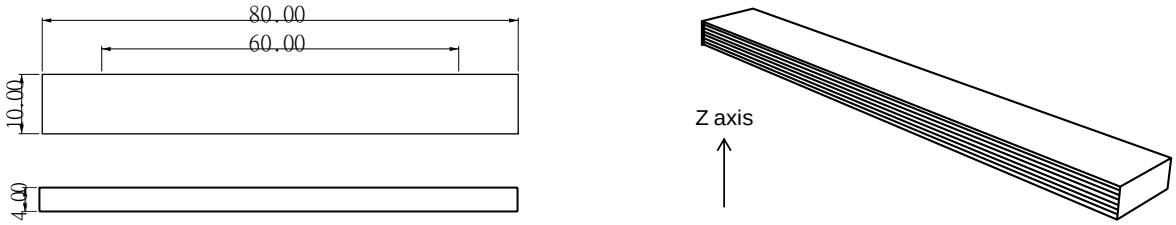

Fig 2. Flexural testing specimen

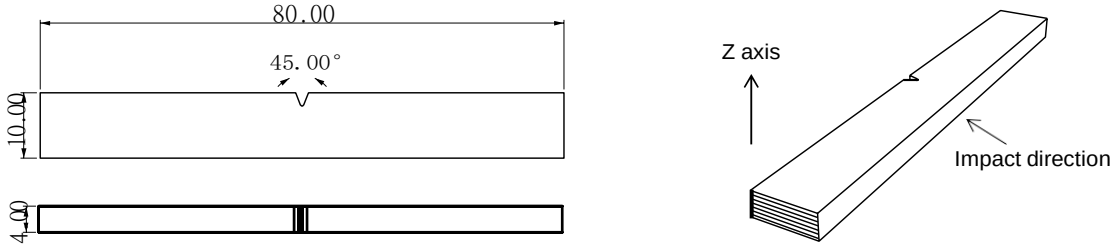

Fig 3. Impact testing specimen

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.