

TECHNICAL DATA



PU20CF-PESU

Product Demonstration



■ Material Overview

PU20CF is a 20% carbon fiber-reinforced PESU pellet material designed for high-temperature composite molding. It combines the excellent thermal and chemical resistance of PESU with the high strength, stiffness, and low warpage characteristics of carbon fiber. With a heat deflection temperature of up to 200°C, it is ideal for demanding mold applications requiring dimensional stability, durability, and cost-efficient production.

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■ Main Features

- ① Excellent heat resistance for high-temperature tooling applications
- ② High strength and stiffness with carbon fiber reinforcement
- ③ Low warpage for improved dimensional stability
- ④ Improved chemical resistance for harsh industrial environments
- ⑤ Large-format 3D printing with lower costs

■ Physical Properties

Property	Test Method	Typical Value
Density (g/cm ³ , 21.5°C)	ASTM D792 (ISO 1183, GB/T 1033)	1.48
Melt Index (g/10 min)	337°C, 6.6 kg	17.5
Glass Transition Temperature (°C)	DSC, 10°C/min	220
Heat Deflection Temperature (°C)	ISO 75 1.8MPa 0.45MPa	214 220

■ Mechanical Properties¹

Property	Test Method	Typical Value
Young's Modulus (MPa) (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	9404 ± 477
Tensile Strength (MPa) (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	74.6 ± 7
Elongation at Break (%) (X-Y)	ASTM D638 (ISO 527, GB/T 1040)	1.01 ± 0.14
Flexural Modulus (MPa) (X-Y)	ASTM D790 (ISO 178, GB/T 9341)	8764 ± 951
Flexural Strength (MPa) (X-Y)	ASTM D790 (ISO 178, GB/T 9341)	117 ± 6.4
Young's Modulus (MPa) (Z)	ASTM D638 (ISO 527, GB/T 1040)	3848 ± 227
Tensile Strength (MPa) (Z)	ASTM D638 (ISO 527, GB/T 1040)	30.6 ± 2.6
Elongation at Break (%) (Z)	ASTM D638 (ISO 527, GB/T 1040)	0.87 ± 0.11
Flexural Modulus (MPa) (Z)	ASTM D790 (ISO 178, GB/T 9341)	3716 ± 235
Flexural Strength (MPa) (Z)	ASTM D790 (ISO 178, GB/T 9341)	47.8 ± 3.3

¹ Specimens were printed using a 340°C nozzle temperature, 8mm nozzle diameter, 22mm shell width, and 3mm layer height. The single-layer printing time was 50 seconds with an extrusion output of 14 kg/h at an ambient temperature of 25°C. Specimens were printed with 100% solid infill.

■ Recommended Printing Conditions

Parameter	Recommended Setting
Drying Temperature (°C)	150-165 (Equipped with dehumidifying dryer)
Drying Time (Hours)	≥4
Maximum Moisture Content (%)	0.06
Barrel Zone 1 Temperature (°C)	300 - 320
Barrel Zone 2 Temperature (°C)	315 - 335
Barrel Zone 3 Temperature (°C)	325 - 345
Nozzle Temperature (°C)	330 - 350

Other Recommendations

- **Short Pauses:**

If printing is stopped for a short duration (e.g., 1-60 minutes), it is recommended to keep the extruder running at a low flow rate (e.g., 2 kg/h) to ensure continuous material supply and avoid long periods of stagnation or screw idling.

- **Long Pauses:**

If printing is stopped for several hours, use high-temperature specialty purging material to clean the extruder.

- **Drying Equipment:**

Drying must be performed using the machine equipped with a dehumidifying dryer.

- **Air Exposure:**

Once dried, the material should not be left in the air for a long time before entering the printer screw; recommended exposure time should not exceed 15 minutes; stricter control is required in humid environments.