

PEEK Filament

Polyether Ether Ketone (PEEK) PEEK is a semicrystalline thermoplastic with excellent mechanical and chemical resistance properties that are retained to high temperatures. PEEK is regarded as one of the highest performing engineering thermoplastics in the world. PEEK is used to fabricate items used in demanding applications in aerospace, automotive, oil and gas and medical industries.

The 3D4MAKERS PEEK Filament has unique properties because it does not come into contact with water during the production process and is directly packaged in a vacuum packaging. These properties make the 3D4MAKERS PEEK Filament particularly suitable for usage in FDM and FFF 3D printers. The material has an excellent adhesion between layers, which results in great improvement of the impact resistance, strength, durability, and the printing process.

MECHANICAL	CONDITIONS	TEST METHOD	TYPICAL VALUE
Tensile Strength	Yield, 23 °C	ISO 527	105 MPa
Tensile Elongation	Break, 23 °C	ISO 527	30%
Tensile Modulus	23 °C	ISO 527	4.1 GPa
Flexural Strength	At 3,5% strain, 23 °	ISO 178	130 MPa
Flexural Modulus	23 °C	ISO 178	3.9 GPa
Compressive Strength	23 °C	ISO 604	130 MPa
Charpy Impact Strength	Notched, 23 °C	ISO 179/1eA	4.2 kJ m ⁻²
Izod Impact Strength	Notched, 23 °C	ISO 180/A	5.0 kJ m ⁻²
THERMAL DATA			
Melting Point		ISO 11357	343 °C
Glass Transition	Onset	ISO 11357	143 °C
Coefficient of Thermal Expansion	Along flow below	ISO 11359	50 ppm K ⁻¹
Heat deflection Temperature	As mouled, 1,8 MPa	ISO 75A-f	156 °C
Thermal Conductivity	Along flow, 23°	ISO 22007-4	0.32 W m ⁻¹ K ⁻¹
Relative Thermal	Electrical	UL 746B	260 °C
FLOW			
Melt Viscosity	400 °C	ISO 11443	130 Pa.s
MISCELLANEOUS			
Density	Crystalline	ISO 1183	1.30 G cm ⁻³
Shore D Hardness	23 °C	ISO 868	85
Water Absorption by Immersion	Saturation, 23 °C	ISO 62-1	0.45%
PRINT RECOMMENDATIONS			
Nozzle Temperature	360-400 °C		
Bed Temperature	120 °C		
Print Speed	15-30 mm/s		
Bed Adhesion	PEI Sheet		



PEEK is a very difficult material to 3D print. Your 3D printer should have the capability to extrude at 420 °C, with a bed temperature of around 120 °C. Print temperatures and optimal chamber temperatures differ depending on the printer but can be found around 360 to 420 °C for the nozzle temperature and around 100 °C for the chamber temperature. Your printer should have adequate thermal control in the build chamber throughout the printing process. Lack of thermal control and incorrect settings could lead to inadequate crystallization of the polymer in your printer. Lack of process control can also lead to specking on the part with black specs forming during printing on your part. Lack of process control and inadequate temperatures can also lead to brown discoloration in the part, which is an indication that the parts has not been properly crystalized. Do not let the PEEK material remain in your printer's nozzle for extended periods of time when not extruding. This will lead to specking and nozzle blockages. You could post 3D printing anneal your PEEK part in an oven. You should pre-dry your PEEK filament in an oven as well. The best build surface for PEEK is PEI sheets.

Disclaimer: 3D4Makers makes no warranties what so ever, expressed or implied, including but not limited to, any implied fitness for any particular purpose. From the moment the product is shipped it is beyond our control. The information in this document is believed to be correct at the time of writing. However, handling, processing, settings, the type of 3D printer, slicing and other variables are completely up to the user. The method through which the product is used can be varied. It is up for the customer to determine how it is 3D printed and whether it is fit for purpose or suited to a particular application.

