PEEK

tm filament
future in filament

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PEEK is considered as one of the best performing thermoplastics in the world. It offers exceptional performance over a wide range of temperatures and extreme conditions. PEEK has a unique combination of thermal, mechanical and chemical resistance properties and can withstand a continuous working temperature of 250°C and it also has an excellent long-term chemical resistance.

Pros

Good chemical resistance
Very good electrical properties
Excellent strength, rigidity and toughness
Low moisture absorption

Cons

High cost
High extruder temperature

Uses

Medical
Aerospace
Automotive

1. Identification of the material

Trade name	tm FilamentPEEK
Chemical name	Polyetheretherketone
Chemical family	Thermoplastic copolymer
Use	3D Printing
Origin	tm Filament Netherlands

2. Material properties

Melt temperature	343	˚C	ISO 11357
Glass transition temperature	143	˚C	ISO 11357
Heat deflection (1.8 MPa)	152	˚C	ISO 75-f
Vicat Softening Temperature (Method A, 10 N)	335	˚C	ISO 306
Flame Rating (1.6 mm)	V-0		UL 94
Met Flow Rate (380 ˚C/5.0 kg)	20	g/10 min	ISO 1133
Density	1.3	g/cm^3	ISO 1183
Water absorption, saturation	0.5	%	ISO 62
Shrink rate	0.4-0.7 %		ASTM D955
Shore D hardness (23 ˚C)	85		ISO 868

3. Mechanical properties

Tensile Strength (yield, 23 ˚C)	100	MPa	ISO 527
Tensile Elongation (break, 23 ˚C)	40	%	ISO 527
Flexural Strength (yield, 23 ˚C)	170	MPa	ISO 178
Flexural Modulus (23 ˚C)	4.2	GPa	ISO 178
Comprehensive Strength (23 ˚C)	125	MPa	ISO 604
Charpy Impact Strength (Notched)	6	kJm^2	ISO 179/1eA
Charpy Impact Strength (Unnotched)	-	kJm^2	ISO 179/1U
Izod Impact (Notched)	6.5	kJm^2	ISO 178
Izod Impact (Unnotched)	-	kJm^2	ASTM D785
Mould Shrinkage (Along flow)	1	%	ISO 294-4
Mould Shrinkage (Across Flow)	1.3	%	ISO 294-4

4. Electrical Data

Dielectric Strength (2 mm)	25	KV-mm	IEC 60243-1
Comparative Tracking Index	150	V	IEC 60112
Dielectic Constant (23 ˚C 1 kHz)	3.2		IEC 60250
Dielectic Constant (23 ˚C 50 Hz)	4.5		IEC 60250
Loss Tangent (23 ˚C, 1 MHz)	0,003		IEC 60250
Volume resistivity (23 ˚C, 1V)	10^{16}	Ω cm	IEC 60093
Volume resistivity (275 ˚C	10^{9}	Ω cm	IEC 60093

5. Printer settings

Printer	Desktop FFF printer
Nozzle	0.4 mm A2 hardened
Layer height	0.2 mm
Infill	100%
Extrusion temperature	360 - 400 ˚C
Bed Temperature	120 - 150 ˚C
Print chamber temperature	70 - 150 ˚C
Cooling fan	yes
Bed preparation	3D lac
Print speed	10 -50 mm/s (the lower the better)