

Polyethylene terephthalate Glycol modified This material is known for making drinking bottles. It is a semi-rigid material with good impact resistance, but it has a slightly softer aspect that it is wear-sensitive. PETG is popular because of its durability, good adhesion and resistance to degradation by water and other chemicals.

Pros

PETG filament has the reputation of combining the functionality of ABS (stronger, temperature resistant, more durable) and reliability of PLA (easy to print) in one material.

The layer adhesion is usually excellent.

Reduced potential of warping or shrinking of your prints.

Also, you can recycle the material, along with prints and misprints. However, don't take this as permission to start printing irresponsibly – sustainably speaking, PETG filament is still a plastic that should be utilized and recycled properly.

Cons

the material properties can be weakened by UV light

More prone to scratching

Not easy to print, needs some practice

Uses

Mechanical parts

Protective components

1. Identification of the material

Trade name	tm filament PETG
Chemical name	Polyethyleentereftalaatglycol
Use	3D printing
Origin	tm filament

2. Material properties

Melt temperature	230	°C	ASTM D3418
Glass transition temperature	80	°C	ASTM D3419
Heat deflection temperature 0.46 MPa	70	°C	ISO 75
Vicat Softening Temperature	85	°C	ASTM D1525
Flame Rating (1.5 mm, ALL)	HB		UL 94
Met Flow Rate (220 C/10.0 kg)	11	g/10 min	ASTM D1238
Density	1.27	g/cm ³	ASTM D790
Water absorption, 24 u	0.13	%	ASTM D570
Shrink rate	0.3 - 0.6	%	ASTM D955

3. Mechanical properties

Tensile Strength (yield, 3.20 mm/50 mm/min)	50	MPa	ASTM D638
Tensile Modulus (3.20 mm/1.0 mm/min)	2100	MPa	ASTM D638
Tensile elongation, (break, 3.20 mm/50 mm/min)	140	%	ASTM D638
Flexural Modulus (3.20 mm/15 mm/min)	1880	MPa	ASTM D790
Flexural Strength (3.20 mm/15 mm/min)	54	MPa	ASTM D790
Rockwell hardness (R-scale)	110		ASTM D785

4. Thermal properties

Deflection Temperature Under Load 1.8 MPa, Unannealed, 6.40 mm	63	°C	ASTM D648
Vicat Softening Temperature	85	°C	ASTM D1525

5. Printer settings

Printer	Desktop FFF printer
Nozzle	0.4 mm A2 hardened
Layer height	0.2 mm
Infill	100%
Extrusion Temperature	230 - 250 °C
Bed temperature	60 - 80 °C
Bed preparation	PEI sheet, kapton tape, 3D laque
Print speed	30-40 mm/s (higher speeds may need slightly hotter printing temp, up to 250°C)

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