Fused Deposition Modeling

PETG

Polyethylene Terephthalate Glycol Copolymer

Product Description

PETG is a very tough material with good thermal resistance. PETG is a good all-around material but stands out from other filaments given its flexibility, strength, temperature, and impact resistance. This makes it ideal for objects that might experience sustained or sudden stress, like mechanical parts, and protective components. It has a healthy amount of flex which can prevent parts from breaking under pressure.

Applications

Its use is universal but especially suitable for mechanical parts and both indoor and outdoor use.

Tolerances

For well-designed parts, tolerances of ±0.012 in. plus ±0.002 in./in. for each additional inch can typically be achieved depending on part geometry. Note that tolerances may change depending on part geometry.

Key Material Benefits

- High Impact Resistance
- Good Thermal Resistance
- Chemical Resistant
- Durable

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Properties

PETG (Polyethylene Terephthalate Glycol Copolymer)

Material Properties	Value	Test Method
Colors	Black, White, Grey, Clear, Yellow, Red, Orange, Green, Blue, Gold	-
Density [g/cm3]	1.27	ISO 1183
Moisture Absorption in 24 hours [%] 24 °C; humidity 22 %	0.07	Supplier Tested
Moisture Absorption in 7 days [%] 24 °C; humidity 22 %	0.1	Supplier Tested
Heat Deflection Temperature (0.45 MPa) [°C]	68	ISO 75
Heat Deflection Temperature (1.80 MPa) [°C]	68	ISO 75
Tensile Yield Strength for Filament [MPa]	46 ± 1	ISO 527
Hardness – Shore D	74	Supplier Tested

Mechanical Properties	Value (X-Y)	Value (X-Z)	Test Method
Tensile Yield Strength [MPa]	47 ± 2	50 ± 1	ISO 527-1
Tensile Modulus [GPa]	1.5 ± 0.1	1.6 ± 0.1	ISO 527-1
Elongation at Yield Point [%]	5.1 ± 0.1	5.1 ± 0.1	ISO 527-1
Flexural Strength [MPa]	66 ± 2	70 ± 1	ISO 178
Flexural Modulus [GPa]	1.7 ± 0.1	1.6 ± 0.1	ISO 178
Deflection at Flexural Strength [mm]	9.0 ± 0.1	9.3 ± 0.2	ISO 178
Impact Strength Charpy [kJ/m2] - Charpy Unnotched	no break	no break	ISO 179-1
Impact Strength Charpy Notched [kJ/m2] - Charpy Notched	6 ± 1	3 ± 1	ISO 179-1

*Technical Values from Supplier Data Sheet

PETG Carbon Fiber (Polyethylene Terephthalate Glycol Copolymer filled with Caron Fibers)

Material Properties	Value	Test Method
Colors	Black	-
Density [g/cm3]	1.27	ISO 1183
Moisture Absorption in 24 hours [%] 24 °C; humidity 22 %	0.07	Supplier Tested
Moisture Absorption in 7 days [%] 24 °C; humidity 22 %	0.1	Supplier Tested
Heat Deflection Temperature (0.45 MPa) [°C]	96	ISO 75
Heat Deflection Temperature (1.80 MPa) [°C]	80	ISO 75
Tensile Yield Strength for Filament [MPa]	52 ± 1	ISO 527
Hardness – Shore D	77	Supplier Tested

Mechanical Properties	Value (X-Y)	Value (X-Z)	Test Method
Tensile Yield Strength [MPa]	47 ± 2	52 ± 2	ISO 527-1
Tensile Modulus [GPa]	1.7 ± 0.1	1.8 ± 0.1	ISO 527-1
Elongation at Yield Point [%]	4.3 ± 0.1	4.5 ± 0.2	ISO 527-1
Flexural Strength [MPa]	68 ± 3	80 ± 2	ISO 178
Flexural Modulus [GPa]	2.3 ± 0.1	3.1 ± 0.1	ISO 178
Deflection at Flexural Strength [mm]	8.4 ± 0.2	8.0 ± 0.2	ISO 178
Impact Strength Charpy [kJ/m2] - Charpy Unnotched	29 ± 6	43 ± 8	ISO 179-1

*Technical Values from Supplier Data Sheet

PETG Tungsten (Polyethylene Terephthalate Glycol Copolymer filled with Tungsten Powder - 75% in mass)

Material Properties	Value	Test Method
Colors	Grey / Silver	-
Density [g/cm3]	4	Supplier Tested
Moisture Absorption in 24 hours [%] 24 °C; humidity 22 %	0.07	Supplier Tested
Moisture Absorption in 7 days [%] 24 °C; humidity 22 %	0.1	Supplier Tested
Heat Deflection Temperature (0.45 MPa) [°C]	94	ISO 75
Heat Deflection Temperature (1.80 MPa) [°C]	86	ISO 75
Tensile Yield Strength for Filament [MPa]	49 ± 1	ISO 527
Hardness – Shore D	79	Supplier Tested

Mechanical Properties	Value (X-Y)	Value (X-Z)	Test Method
Tensile Yield Strength [MPa]	35 ± 4	39 ± 6	ISO 527-1
Tensile Modulus [GPa]	1.9 ± 0.2	2.1 ± 0.2	ISO 527-1
Elongation at Yield Point [%]	3.5 ± 0.4	3.1 ± 0.5	ISO 527-1
Flexural Strength [MPa]	59 ± 1	70 ± 2	ISO 178
Flexural Modulus [GPa]	2.8 ± 0.1	2.8 ± 0.2	ISO 178
Deflection at Flexural Strength [mm]	6.7 ± 0.2	6.1 ± 0.2	ISO 178
Impact Strength Charpy [kJ/m2] - Charpy Unnotched	22 ± 2	19 ± 3	ISO 179-1

Radiation shielding properties	Value	Test Method
Half-value layer HVL [mm]	1.402	when applied 99mTc, 140 keV

*Technical Values from Supplier Data Sheet

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