

# Technical data sheet PC

Ultimaker

Chemical name	Polycarbonate
Description	With Ultimaker PC filament, you can print strong and tough parts that retain dimensional stability when subjected to temperatures as high as 110 °C. Our PC is engineered to be printed at moderate temperatures compared to other PC filaments and shows minimized warping providing a seamless 3D printing experience.
Key features	High toughness (especially for the non-transparent filament options), temperature resistance, flame retardant characteristics, dimensionally stable, strong interlayer bonding (especially when using the front enclosure add-on), good bed adhesion (especially when using adhesion sheets). Allows printing of translucent parts with the transparent filament option.
Applications	Lighting, molds, engineering parts, tools, functional prototyping and short run manufacturing.
Non-suitable for	Food contact and in-vivo applications. Applications where the printed part is exposed to temperatures higher than 110 °C.

## Filament specifications

	<u>Value</u>	<u>Method</u>
Diameter	2.85±0.05 mm	Ultra-fast CCS-based, dual-axis diameter gauge
Max roundness deviation	0.05 mm	Ultra-fast CCS-based, dual-axis diameter gauge
Net filament weight	750 g	-
Filament length	~99 m	-

## Color information

<u>Color</u>	<u>Color code</u>
PCTransparent	n/a
PC Black	RAL 9005
PC White	RAL 9003

## Mechanical properties (\*)(\*\*)

## Injection molding

## 3D printing

	<u>Typical value</u>	<u>Test method</u>	<u>Typical value</u>	<u>Test method</u>
Tensile modulus	-	-	2134 MPa (t) 1904 MPa (b/w)	ISO 527 (1 mm/min)
Tensile stress at yield	-	-	-	-
Tensile stress at break	-	-	76.4 MPa (t) 53.7 MPa (b/w)	ISO 527 (50 mm/min)
Elongation at yield	-	-	-	-
Elongation at break	-	-	6.4 % (t) 5.9 % (b/w)	ISO 527 (50 mm/min)
Flexural strength	-	-	111.0 MPa (t) 95.5 MPa (b/w)	ISO 178
Flexural modulus	-	-	2410 MPa (t) 2310 MPa (b/w)	ISO 178
Izod impact strength, notched (at 23°C)	-	-	4.1 kJ/m <sup>2</sup> (t) 14.9 kJ/m <sup>2</sup> (b/w)	ISO 180
Charpy impact strength (at 23°C)	-	-	-	-
Hardness	-	-	82 (Shore D)(t) 80 (Shore D)(b/w)	Durometer

## Thermal properties

## Typical value

## Test method

Melt mass-flow rate (MFR)	32 - 35 g/10 min (t) 23 - 26 g/10 min (b/w)	(300 °C, 1.2 kg)
Heat deflection (HDT) at 0.455 MPa	-	-
Heat deflection (HDT) at 1.82 MPa	-	-
Glass transition	112 - 113 °C	DSC, 10 °C/min
Coefficient of thermal expansion	-	-
Melting temperature	-	-
Thermal shrinkage	-	-

## Other properties

## Typical value

## Test method

Specific gravity	1.18 -1.20	ASTM D792
Flame classification	preliminary tested*	-

(\*) See notes.

(\*\*) t: transparent. b/w: black/white.

## Notes

Properties reported here are average of a typical batch. The 3D printed test specimens were printed in the XY plane, using the normal quality profile in Cura 2.1, an Ultimaker 2+, a 0.4 mm nozzle, 90% infill, 260 °C nozzle temperature and 110 °C build plate temperature. The values are the average of 5 natural, 5 white and 5 black specimens for the tensile, flexural, and impact tests. The Shore hardness D was measured in a 7-mm-thick square printed in the XY plane, using the normal quality profile in Cura 2.5, an Ultimaker 3, a 0.4 mm print core and 100% infill. Ultimaker is constantly working on extending the TDS data.

Ultimaker PC could pass V-2 (VL94) at thickness > 1 mm when printed with 100% infill.  
Lower infill may lead to reduced flame retardancy performance.

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