

# Technical data sheet CPE+

Ultimaker

Chemical name	Copolyester
Description	CPE+ is chemical and temperature resistant, tough and demonstrate good dimensional stability. CPE+ shows higher temperature resistance and increased impact strength than regular CPE.
Key features	Excellent chemical resistance, temperature resistance, toughness and dimensional stability, good interlayer adhesion (especially when using the front enclosure add-on), good bed adhesion (especially when using the adhesion sheets), and low levels of ultrafine particles (UFPs) and volatile organic compounds (VOCs). Allows printing of translucent parts with the transparent filament option.
Applications	Visual and functional prototyping and short run manufacturing.
Non-suitable for	Food contact and in-vivo applications. Long term outdoor usage or applications where the printed part is exposed to temperatures higher than 100 °C.

## Filament specifications

	<u>Value</u>	<u>Method</u>
Diameter	2.85±0.10 mm	-
Max roundness deviation	0.10 mm	-
Net filament weight	700 g	-
Filament length	~93 m	-

## Color information

	<u>Color</u>	<u>Color code</u>
	CPE+ Transparent	n/a
	CPE+ Black	RAL 9005
	CPE+ White	RAL 9010 (est.)

## Mechanical properties (\*)

	<u>Injection molding</u>		<u>3D printing</u>	
	Typical value	Test method	Typical value	Test method
Tensile modulus	1575 MPa	ASTM D638	1128.5 MPa	ISO 527 (1 mm/min)
Tensile stress at yield	43 MPa	ASTM D638	35.2 MPa	ISO 527 (50 mm/min)
Tensile stress at break	52 MPa	ASTM D638	33.0 MPa	ISO 527 (50 mm/min)
Elongation at yield	7 %	ASTM D638	6.0 %	ISO 527 (50 mm/min)
Elongation at break	210 %	ASTM D638	6.6 %	ISO 527 (50 mm/min)
Flexural strength	64 MPa	ASTM D790	65.0 MPa	ISO 178
Flexural modulus	1575 MPa	ASTM D790	1555.0 MPa	ISO 178
Izod impact strength, notched (at 23°C)	860 J/m	ASTM D256	6.2 kJ/m <sup>2</sup>	ISO 180
Charpy impact strength (at 23°C)	-	-	-	-
Hardness	111 (Rockwell)	ASTM D785	75 (Shore D)	Durometer

## Thermal properties

	<u>Typical value</u>	<u>Test method</u>
Melt mass-flow rate (MFR)	8.5 g/10min	ISO 1133 (260 °C, 1.2 kg)
Heat deflection (HDT) at 0.455 MPa	94 °C	ASTM D648
Heat deflection (HDT) at 1.82 MPa	81 °C	ASTM D648
Glass transition	-	-
Coefficient of thermal expansion	-	-
Melting temperature	-	-
Thermal shrinkage	-	-

## Other properties

	<u>Typical value</u>	<u>Test method</u>
Specific gravity	1.18	ASTM D792
Flame classification	-	-

(\*) See notes.

## 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.

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