

Technical data sheet CPE

Ultimaker

Chemical composition	See CPE safety data sheet, section 3
Description	CPE is chemical resistant, strong, tough, and demonstrates good dimensional stability. CPE is available in a wide range of colors, including grayscale for more professional looking models
Key features	Excellent chemical resistance, toughness, and dimensional stability. Good interlayer adhesion (especially when printing within an enclosed environment). And low levels of ultrafine particles (UFPs) and volatile organic compounds (VOCs)
Applications	Visual and functional prototyping, and short-run manufacturing
Non-suitable for	Food contact and <i>in vivo</i> applications. Long term outdoor usage or applications where the printed part is exposed to temperatures higher than 70 °C

Filament specifications

	Value	Method
Diameter	2.85 ± 0.05 mm	-
Max roundness deviation	0.05 mm	-
Net filament weight	750 g	-
Filament length	~ 93 m	-

Color information

Color	Color code
CPE Black	RAL 6017 (est.)
CPE White	RAL 9010 (est.)
CPE Light Gray	RAL 7035
CPE Dark Gray	RAL 7043
CPE Red	RAL 3028 (est.)
CPE Blue	RAL 5012 (est.)
CPE Yellow	RAL 1021 (est.)
CPE Green	Pantone 368C (est.)
CPE Transparent	N/A

Mechanical properties*

	Injection molding		3D printing	
	Typical value	Test method	Typical value	Test method
Tensile modulus	1,900 MPa	ASTM D638	1,537.5 MPa	ISO 527 (1 mm/min)
Tensile stress at yield	50 MPa	ASTM D638	41.1 MPa	ISO 527 (50 mm/min)
Tensile stress at break	28 MPa	ASTM D638	37.7 MPa	ISO 527 (50 mm/min)
Elongation at yield	5%	ASTM D638	4.7%	ISO 527 (50 mm/min)
Elongation at break	110%	ASTM D638	5.1%	ISO 527 (50 mm/min)
Flexural strength	-	-	79.5 MPa	ISO 178
Flexural modulus	2,100 MPa	ASTM D790	1,990 MPa	ISO 178
Izod impact strength, notched (at 23 °C)	95 J/m	ASTM D256	4.0 kJ/m ²	ISO 180
Charpy impact strength (at 23 °C)	-	-	-	-
Hardness	108 (Rockwell)	ASTM D785	72 (Shore D)	Durometer

Electrical properties*

	Typical value	Test method	Typical value	Test method
Dissipation factor (at 1 MHz)	-	-	0.021	ASTM D150-11
Dielectric constant (at 1 MHz)	-	-	2.70	ASTM D150-11

Thermal properties

	Typical value	Test method
Melt mass-flow rate (MFR)	13.2 g/10 min	ISO 1133 (240 °C, 2.16 kg)
Heat detection (at 0.455 MPa)	70 °C	ASTM D648
Heat deflection (at 1.82 MPa)	62 °C	ASTM D648
Vicat softening temperature	-	-
Glass transition	~ 82 °C	DSC
Coefficient of thermal expansion	7 10 ⁻⁵ mm/mm °C	-
Melting temperature	Not relevant (amorphous)	-
Thermal shrinkage	-	-

*See notes

Other properties

	Value	Test method
Specific gravity	1.27	ASTM D792
Flame classification	Not tested (typically HB when molded)	-

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 Ultimaker Cura 2.1, an Ultimaker 2+, a 0.4 mm nozzle, 90% infill, 250 °C nozzle temperature, and 70 °C build plate temperature. The values are the average of five white and five black specimens for the tensile, flexural, and impact tests. The Shore hardness D was measured in a 7-mm-thick square using the normal quality profile in Ultimaker Cura 2.5, an Ultimaker 3, a 0.4 mm print core, and 100% infill. The electrical properties were measured on a 54-mm-diameter disk with 3 mm thickness printed in the XY plane, using the fine quality profile (0.1 mm layer height) in Ultimaker Cura 3.2.1, 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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