Technical data sheet CPE

Ultimaker

Chemical name	Copolyester
Description	CPE is chemical resistant, strong, tough and demonstrate good dimensional stability. CPE is available in a wide range of colors to choose from, including gray scale for more professional looking models.
Key features	Excellent chemical resistance, toughness and dimensional stability, good interlayer adhesion (especially when using the front enclosure add-on), 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 in-vivo 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±0.10 mm	-
Max roundness deviation	0.10 mm	-
Net filament weight	750 g	-
Net filament length	~93 m	-

Color information	Color	Color code
	CPE Black	RAL 9017 (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	1900 MPa	ASTM D638	1537.5 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	100 %	ASTM D638	5.1 %	ISO 527 (50 mm/min)
Flexural strength	-	-	79.5 MPa	ISO 178
Flexural modulus	2100 MPa	ASTM D790	1990.0 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

Thermal properties	Typical value	Test method
Melt mass-flow rate (MFR)	13.2 g/10min	ISO 1133 (240 ˚C, 2.16 kg)
Heat deflection (HDT) at 0.455 MPa	70 ˚C	ASTM D648
Heat deflection (HDT) at 1.82 MPa	62 ˚C	ASTM D648
Glass transition	~ 82 ˚C	DSC
Coefficient of thermal expansion	7·10^{-5} mm/mm ˚C	ASTM E693
Melting temperature	Not relevant (amorphous)	-
Thermal shrinkage	-	-

Other properties	Typical value	Test method
Specific gravity	1.27	ASTM D792
Flame classification	Not tested (typically HB when molded)	-

(*) 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, 250 ˚C nozzle temperature and 70 ˚C build plate temperature. The values are the average of 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.

Disclaimer

Version Version 3.011

Date 06/06/2017

Ultimaker