

Technical data sheet CPE+

Ultimaker

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| Chemical composition | See CPE+ safety data sheet, section 3 |
| Description | CPE+ is chemical and temperature resistant, tough, and demonstrates 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 <i>in vivo</i> applications. Long term outdoor usage or applications where the printed part is exposed to temperatures higher than 100 °C |

Filament specifications

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

Color information

| Color | Color code |
|------------------|-------------------|
| CPE+ Transparent | N/A |
| CPE+ Black | RAL 9005 |
| CPE+ White | RAL 9010 (est.) |

Mechanical properties*

| | Injection molding | | 3D printing | |
|--|-------------------|-------------|-----------------------|------------------------|
| | Typical value | Test method | Typical value | Test method |
| Tensile modulus | 1,575 MPa | ASTM D638 | 1,128.5 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 MPa | ISO 527 (50 mm/min) |
| Elongation at yield | 7% | ASTM D638 | 6% | 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 MPa | ISO 178 |
| Flexural modulus | 1,575 MPa | ASTM D790 | 1,555 MPa | ISO 178 |
| Izod impact strength, notched (at 23 °C) | 860 J/m | ASTM D256 | 6.2 kJ/m ² | ISO 180 |
| Charpy impact strength (at 23 °C) | - | - | - | |
| Hardness | 111 (Rockwell) | ASTM D785 | 75 (Shore D) | Durometer |

Electrical properties*

| | Typical value | Test method | Typical value | Test method |
|--------------------------------|---------------|-------------|---------------|--------------|
| Dissipation factor (at 1 MHz) | - | - | 0.015 | ASTM D150-11 |
| Dielectric constant (at 1 MHz) | - | - | 2.77 | ASTM D150-11 |

Thermal properties

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

*See notes

Other properties

| | Value | Test method |
|-----------------------------|--------------|--------------------|
| Specific gravity | 1.18 | ASTM D792 |
| Flame classification | - | - |

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, 260 °C nozzle temperature, and 110 °C build plate temperature. The values are the average of five natural, 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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| Version | Version 4.002 |
| Date | November 19, 2018 |