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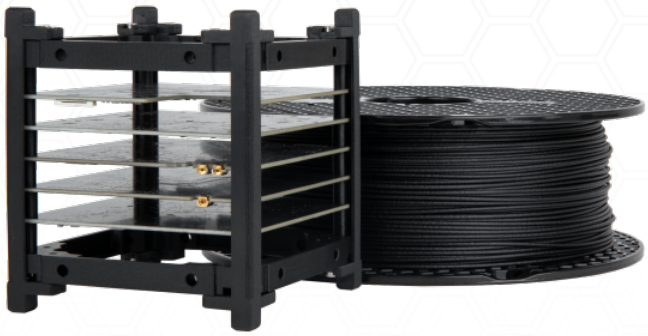
PRUSA POLYMERS by JOSEF PRUSA

Technical datasheet

Prusament PC Space Grade Black by Prusa Polymers



Identification

Trade Name	**Prusament PC Space Grade Black**
Chemical Name	**Polycarbonate filled with carbon-based additives**
Usage	**FDM/FFF 3D printing**
Diameter	**1.75 ± 0.04 mm**
Manufacturer	**Prusa Polymers a.s., Prague, Czech Republic**

Recommended print settings

Nozzle Temperature [°C]	290 ± 10
Heatbed Temperature [°C]	120 ± 10
Print Speed [mm/s]	up to 100
Cooling Fan Speed [%]	0 (only when printing bridges, it is at 100%)
Bed Type	Satin / TXT / PP sheet
Additional Info	A hardened nozzle is necessary. The brim is recommended to improve the adhesion of the edges and corners of the object.

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Typical material properties

	Typical Value	Method
MFR [g/10 min]	N/A	ISO 1133
MVR [cm^3/10 min]	N/A	ISO 1133
Density [g/cm^3]	1.21	ISO 1183
Moisture Absorption in 24 hours [%](1)	0.18	Prusa Polymers
Moisture Absorption in 7 days [%](2)	0.20	Prusa Polymers
Heat Deflection Temperature (0.45 MPa) [°C]	137.6	ISO 75
Heat Deflection Temperature (1.80 MPa) [°C]	128.8	ISO 75
Tensile Yield Strength for Filament [MPa]	N/A	ISO 527
Hardness – Shore D	83 ± 1	Prusa Polymers
Interlayer Adhesion [MPa]	18 ± 1	Prusa Polymers

(1) 24 °C; humidity 42 %

Mechanical properties of 3D printed testing specimens(2)

Property\Print Direction	Horizontal	Vertical xz	Method
Tensile Yield Strength [MPa]	72 ± 2	75 ± 2	ISO 527-1
Tensile Modulus [GPa]	3.1 ± 0.1	3.7 ± 0.1	ISO 527-1
Elongation at Yield Point [%]	3.8 ± 0.2	3.0 ± 0.3	ISO 527-1
Flexural Strength [MPa]	89 ± 2.1	104 ± 2	ISO 178
Flexural Modulus [GPa]	3.7 ± 0.1	4.9 ± 0.5	ISO 178
Deflection at Flexural Strength [mm]	5.6 ± 0.2	5.0 ± 0.3	ISO 178
Impact Strength Charpy [kJ/m^2](3)	22 ± 2	27 ± 2	ISO 179-1
Impact Strength Charpy Notched [kJ/m^2](4)	N/A	N/A	ISO 179-1

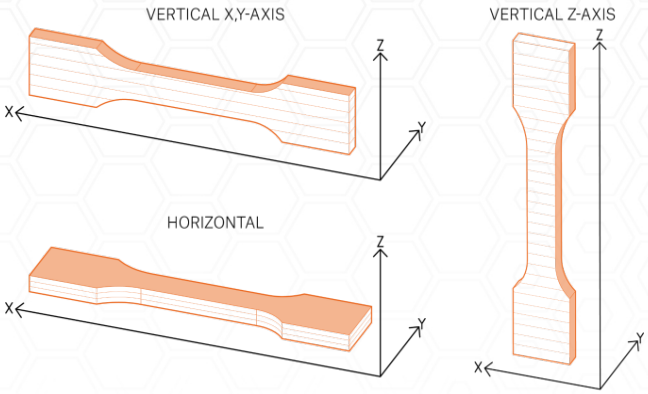
Outgassing and resistivity properties of 3D printed testing specimens(5)

	Typical Value	Method
Volume resistivity [Ohm x m]	2.2x104 ± 0.4x104	Prusa Polymers (6)
Surface resistivity [Ohm/sq]	6.0x107 ± 2.5x107	Prusa Polymers (6)
TML (Total Mass Loss) [%]	0.25 ± 0.01	ECSS-Q-70-02
RML (Recovered Mass Loss) [%]	0.12 ± 0.01	ECSS-Q-70-02
CVCM (Collected Volatile Condensable Material) [%]	0.00 ± 0.00	ECSS-Q-70-02

(2) The Prusa CORE One printer was used to make testing specimens. Prusa Slicer 2.8.2 was used to create G-codes with the following settings:

- Prusament PC Space Grade Black Filament;
- Print Settings: 0.20 mm (layers 0.20 mm);
- Solid Layers: Top: 0, Bottom: 0;
- Perimeters: 2;
- Infill: 100% rectilinear;
- Infill Print Speed: 100 mm/s;
- Nozzle Temperature: 290 °C all layers;
- Bed Temperature: 120 °C all layers
- Extrusion multiplier: 1.04;
- Infill/perimeters overlap: 45%;
- Cooling disabled

Other parameters are left at default values.



(3) Charpy unnotched – Edgewise direction of blow according to ISO 179-1

(4) Charpy notched – Edgewise direction of blow according to ISO 179-1

(5) Outgassing and resistivity values were obtained directly from the 3D printed samples, without any post-processing

(6) Measurements were performed according to commonly accepted electrical engineering methods (measurement with a megohmmeter in a three-electrode configuration, voltage 300 V, stabilization 60 s). These methods provide relevant and comparable results that can be used as supporting documentation for ESD/EMC analysis in accordance with ECSS requirements, but not as direct evidence of compliance with the ECSS standard. Samples printed in X-Y axis orientation on Prusa CORE One with default settings (3).

Disclaimer:

The results presented in this data sheet are just for your information and comparison. Values are significantly dependent on print settings, operator experiences, and surrounding conditions. Everyone has to consider suitability and possible consequences of printed parts usage. Prusa Polymers can not carry any responsibility for injuries or any loss caused by using Prusa Polymers material. Before using Prusa Polymers material read properly all the details in the available safety data sheet (SDS).