Material Data Sheet
PET

General Information

Extruded amorphous Polyethylene Terephthalate (PET) for 3D printing with a wide operating window for easy use. The lower printing temperatures provide for less energy consumption and a smaller environmental impact and carbon footprint. This high definition odourless filament conforms to tight diameter and ovality tolerances and enables print details with precision, good surface and high resolution. It exhibits excellent colour coverage and batch-to-batch colour consistency. It is inherently UV resistant.

3D processing method: FFF (Fused Filament Fabrication)

Diameter (mm): 1,75 and 2,85

Form: wound on a spool (app 310/117 m per 1 kg of 1,75/2,85 mm filament)

Diameter tolerance (mm): ± 0,05/± 0,06 on 100 % of the 1,75/2,85 filament length

Packaging: packed in a hermetically sealed plastic bag with silica gel

Colours (with RAL code where applicable): Transparent, White (9016), Metallic Silver, Dark Grey (7011), Black (9017), Dark Blue (5002), Light Blue (5015), Light Green (6018), Dark Green (6002), Red (3020), Orange (2008), Yellow (1023).

Physical Properties	Standard	Value	Unit
Density	ISO 1183	**1,341**	g/cm^3
Melt Flow Index	ISO 1133 (285°C/2,16 kg)	**47**	g/10 min

Thermal Properties	Standard	Value XY (Flat)	Value	Unit
Heat Deflection Temperature	ISO-75-2 (0,45 MPa)	**65,7**		°C
Vicat Softening Temperature	ISO 306:2014, B/50	**65,9**		°C
Glass Transition Temperature	DSC (10°C/min)		**70**	°C
Melting Temperature			**amorphous**	°C

Mechanical Properties	Standard	Value XY (Flat)	Value Z (Up)	Unit
Tensile Modulus	ISO 527-2:2012 (1 mm/min)	**2.564**	**2.610**	MPa
Tensile Stress at Yield	ISO 527-2:2012 (50 mm/min)	**59,4**	**34,3**	MPa
Tensile Stress at Break	ISO 527-2:2012 (50 mm/min)	**54,3**	**30,9**	MPa
Elongation at Yield	ISO 527-2:2012 (50 mm/min)	**2,9**	**1,4**	%
Elongation at Break	ISO 527-2:2012 (50 mm/min)	**5,2**	**1,5**	%
Flexural Modulus	ISO 178:2019 (1 mm/min)	**2.621**	**2.276**	MPa
Flexural Strength	ISO 178:2019 (5 mm/min)	**87,5**	**41,9**	MPa
Charpy Impact Strength Notched	ISO 179-1:2011 (2,9 m/s; 0,5 J)	**1,7 (C)***	**1,5 (C)***	kJ/m²
Hardness	ISO 868:2004	**75,3**		Shore D

The tests were performed on material in black colour either on filament or 3D printed parts (XY/Flat or Z/Up). **Printing conditions (3D specimens):** Prusa i3MKS3, nozzle: 215 °C, nozzle type: brass, nozzle diameter: 0,4 mm, bed temperature: 75 °C, layer height 0,2 mm, infill: 100 %, active cooling fan: 50-100 %, perimeter No: 4 (flat) & 3 (up), printing speed: 45 mm/s, chamber: closed. **Testing conditions**: specimens kept at temperature 23°C less than 24 hours (for HDT more than 48 hours). Tested at 23°C and relative humidity 49,5 % (for HDT 35 %). * C = complete break

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Printing Conditions

Processing Method: FFF (Fused Filament Fabrication)

Drying: Dry at 60°C for 6 (for improved surface up to 12) hours before printing. Use a dry-box / controlled environment during printing (e.g. relative humidity 20% or lower). Store in a sealed bag.

Adhesion: Use glue for glass bed and cool down for better part removal from.

Nozzle Temperature (°C): 210 ± 20. We recommend lower end of the temperature range for better surface and less stringing; use higher end of the temperature range for better mechanical properties.

Speed (mm/s): 60 ± 20

Bed temperature (°C): 70 ± 10 (depending on the conditions and complexity of the print, bed heating can be turned off).

Retraction speed (mm/s): 35 – 45

Retraction length (mm): direct drive ≥0,8; Bowden drive 8

Active cooling (%): 20 – 100

Compliance

This material is compliant with:

- **REACH**: Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- **RoHS 2**: Directive 2011/65/EU

Notes

The diameter of our filament is measured with **triple axis diameter gauges** for the most precise measurement readings. This leaves less room for error and reduces the possibility of ovality deviation in comparison to both, single- and double-axis gauges. With the accuracy of ± 1 µm and resolution 0,01 µm, our laser devices take 30.000 scans per second (or 10.000 scans/second/axis). The chance of an undetectable filament over-extrusion is reduced three-fold compared to a double-axis gauge.

Contact Information

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