

## Technical data sheet: P-filament

Polypropylene (PP) is one of the most widely used plastics with a broad property profile. PP is one of the lightest materials and has excellent mechanical and chemical properties.

### Material description

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|               |                             |
|---------------|-----------------------------|
| Trade name    | P-filament                  |
| Manufacturer  | PPprint GmbH                |
| Polymer group | Thermoplastic polymer       |
| Chemical name | Polypropylene copolymer     |
| Use           | Extrusion-based 3D printing |

### Suggested 3D print settings (nozzle diameter 0.4mm)

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|                     |   |
|---------------------|---|
| Nozzle temperature  | 200 - 220 °C  |
| Bed temperature     | 20 °C (50 - 80 °C recommended for the first layer, 100 – 110 °C for non-destructive removal after completion) |
| Chamber temperature | not required  |
| Bed modification    | P-surface   |
| Active fan cooling  | recommended   |
| Layer height        | 0.1 – 0.4 mm  |
| Print speed         | 15 – 40 mm/s  |

## Material properties

|                               |                              |            |
|-------------------------------|------------------------------|------------|
| Melt temperature              | 137 °C                       | ASTM D3418 |
| Melt Flow Rate <sup>1</sup>   | 19.3 g/10 min                | ISO 1133   |
| Melt Volume Rate <sup>1</sup> | 25.7 cm <sup>3</sup> /10 min | ISO 1133   |
| Density                       | 0.9 g/cm <sup>3</sup>        | ISO 1183   |
| Odor                          | odorless                     | -          |

<sup>1</sup> Test conditions: T = 210 °C; m = 5.0 kg

## Mechanical properties: Tensile test

All specimens were punched out of printed square tubes consisting of two shells, which were 3D printed with a Raise Pro 3D printer and applying the following printing conditions:

Nozzle temperature: 210 °C;

Bed temperature: 70 °C;

Chamber temperature: 70 °C;

Printing speed: 30 mm/s.

90°



punched dog bone: S 3A with an orientation of 90° to the nozzle movement direction

0°



punched dog bone: S 3A with an orientation of 0° to the nozzle movement direction

|                        |            |            |
|------------------------|------------|------------|
| E-Modul (MPa)          | 640 ± 20   | 660 ± 10   |
| Yield strength (MPa)   | 18.1 ± 0.1 | 19.6 ± 0.3 |
| Tensile strength (MPa) | 18.7 ± 0.3 | 35.1 ± 0.6 |
| Strain at break (%)    | > 600      | > 600      |

## Certifications/ approvals\*

PPprint GmbH

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Regulation EU Nr. 10/2011      Union Guidelines on Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food (Europe)

FDA                                      Food and Drug administration approval (USA)

\* These data are generated using information obtained from the raw material suppliers.

## Filament specification

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|                       |                |         |
|-----------------------|----------------|---------|
| Diameter 1.75         | 1.75 ± 0.10 mm | PPprint |
| Diameter 2.85         | 2.85 ± 0.10 mm | PPprint |
| Ovality               | 0.05           | PPprint |
| Netto weight on spool | 600 g ± 5%     | PPprint |

## Annotation

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The data and properties presented here are averages of a standard batch. The 3D printed square tubes from which the specimens were punched out were produced in Slic3r version 1.3.0.

## Disclaimer

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