Innofil3D | BASF We create chemistry

# Factsheet | PRO1

## Raising the limits

Innofil3D polymer chemists have developed PRO1 as a high-speed engineering thermoplastic that prints as easy as PLA at speeds previously considered unusable. Yet it retains far better mechanical properties that exceed printed ABS objects, something that the most demanding users have always had to make a compromise on prior to PRO1.

By varying the print settings for this multi-purpose robust filament, users can home in on optimizing for speed, strength, surface quality or a mix of those qualities beyond performance levels of traditional filaments.

When you find yourself in an environment that requires reliable performance print after print, look no further than to increase your productivity with PRO1.

## Efficiency and performance

PRO1 offers professionals a solution that enables them to make functional parts without the hassle of tinkering with settings. It is a fast, strong and impact resistant standard material suitable for all desktop FDM printers. It is a perfect material for prototyping and has been developed to withstand high stress or strain. PRO1 offers major advantages:

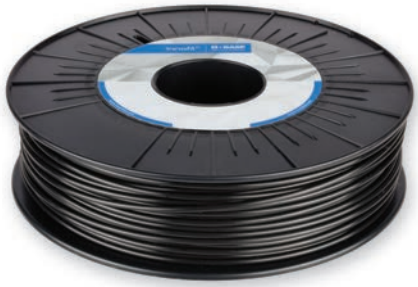
### Advantages of PRO1

- **Speed: Reduce your printing time by 30% – 80%, (subject to printer and object limitations)**
- **Strength: Excels overall beyond printed ABD in mechanical properties**
- **Versatility: One filament that can be tuned towards blazing speed and excellent surface finish**
- **Consistency: Truly consistent filament, also between colors and batches, it will perform as expected, every time**

## Properties

As a multi-purpose engineering material PRO1 can fulfil all desires for efficient (fast) 3D-printing, strong parts and excellent surface quality.

## Challenging the standard in FDM printing



Speed. Strength. Versatility. A filament for professionals.

## Increased productivity

Our Innofil3D polymer chemists modified the flow of the material to enable PRO1 to be used at high speeds. By cranking up the speed you can save at least 30%* in printing time. To achieve this high speed, we recommend to set your printer in the temperature range of 220°C to 230°C*. Superfast printing may affect the surface quality.

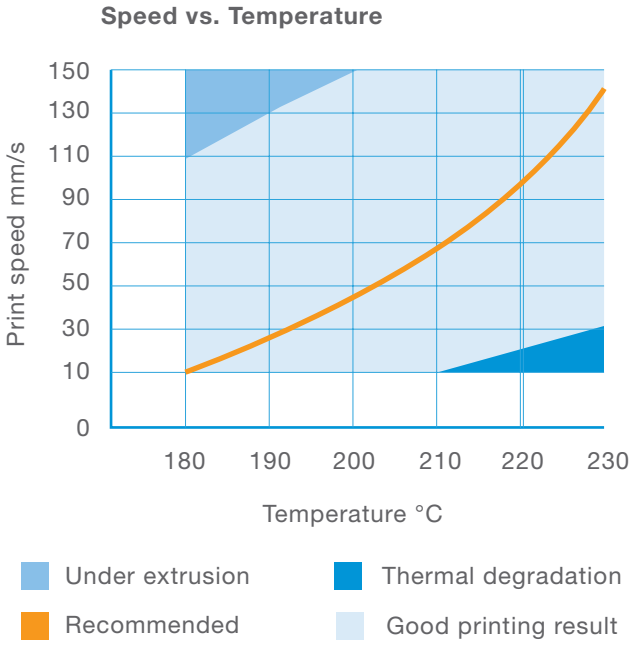
## High performance

Easy printing and creating functional parts have been a challenge for the industry. With PRO1 professionals can create printed objects which have the properties to withstand high stress but still have an easy printing experience. PRO1 has strong layer adhesion which makes prints much stronger, thus increasing functionality.

*Results may differ due to the mechanical properties of the 3D-printer.

| Functional properties | Current ABS | PLA | PRO1 |
|---|---|---|---|
| Tensile Strength | - | + | ++ |
| Impact Strength | ++ | - | + |
| Flexural Strength | - | + | + |
| Resolution | + | + | ++ |
| Overall Score Print Result | +/- | + | ++ |

| Easy to print | ABS | PLA | PRO1 |
|---|---|---|---|
| No smelling during printing | - | ++ | ++ |
| No warping | - | + | + |
| Printer settings not so critical, large operating window | - | + | ++ |
| Printing speed | + | + | ++ |
| No modifications to print surface necessary. Additions to printer/print platform before printing | - | ++ | ++ |
| Overall Score Easy to print | +/- | + | ++ |




# Print settings

### Fast print settings

| 10 hours | |
|---|---|
| Print temp. | 220 °C ± 10 °C |
| Print speed | 120 – 150 mm/s |
| Fill density | ≥ 20% |
| Bed adhesion | Clean glass |
| Fan speed | 100% |
| Top thickness | 1.2 mm |
| Layer Height | 0.1 mm |
| Bed temp. | 60 °C or non-heated bed with tape/glue |

### Strong settings

| 26 hours | |
|---|---|
| Print temp. | 220 °C ± 10 °C |
| Print speed | 40 – 70 mm/s |
| Fill density | ≥ 20% (higher = stronger |
| Bed adhesion | Clean glass |
| Fan speed | 0% |
| Top thickness | 1.2 mm (thicker = stronger) |
| Layer Height | ≤ 0.06 mm (smaller = stronger) |
| Bed temp. | 60 °C or non-heated bed with tape/glue |

### Aesthetics settings

| 26 hours | |
|---|---|
| Print temp. | 210 °C ± 10 °C |
| Print speed | ≤ 70 mm/s |
| Fill density | ≥ 20% |
| Bed adhesion | Clean glass |
| Fan speed | 100% |
| Top thickness | 1.2 mm (thicker = stronger) |
| Layer Height | ≤ 0.1 mm (smaller = better) |
| Bed temp. | 60 °C or non-heated bed with tape/glue |