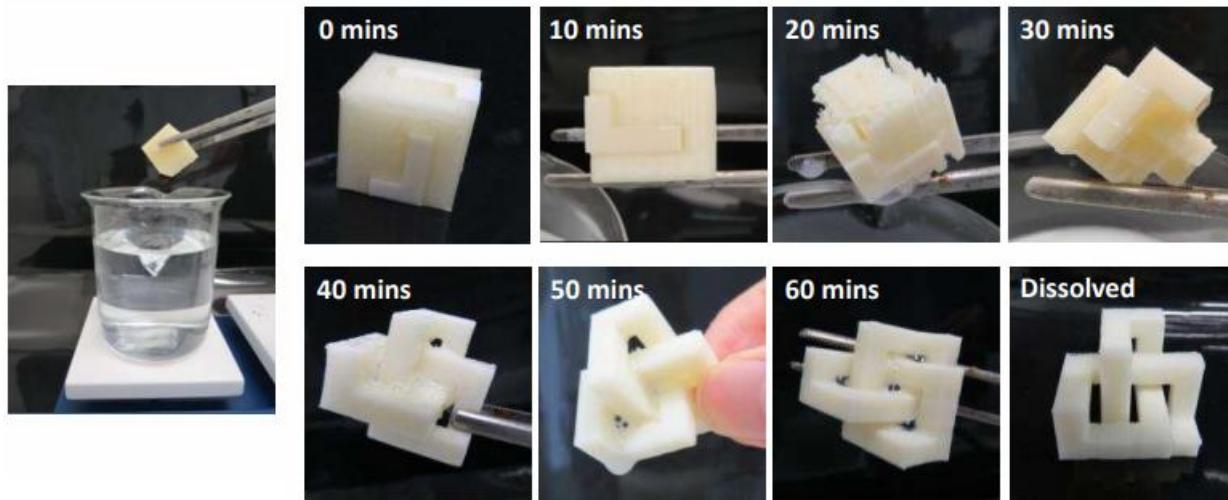
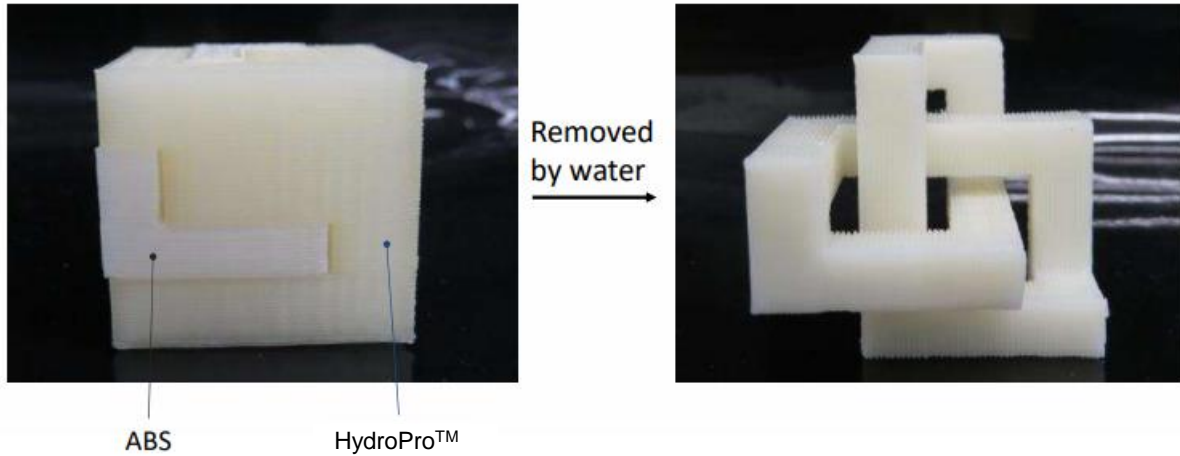


## Technical Data Sheet: HydroPro™

### General

HydroPro™ is a water soluble support filament that has good molten processability compared with conventional support filaments.



- Test condition
- Water temp.: R.T.
  - Rotation speed: 500 rpm

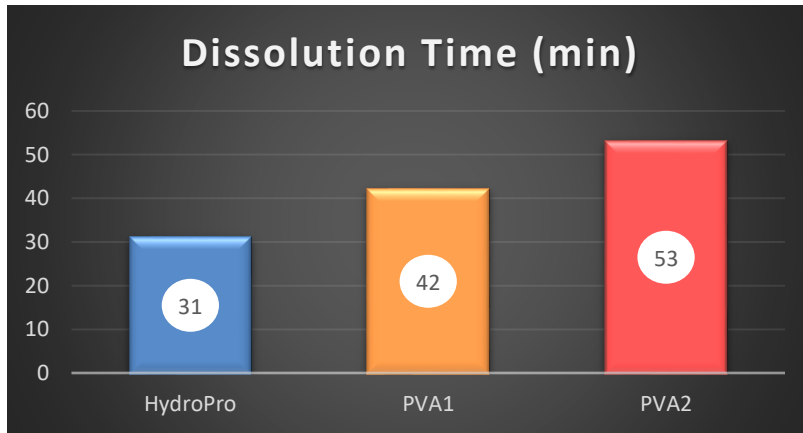
### Recommended Uses

3D printing, fused filament fabrication (FFF), water soluble support material.

### Form & Characteristics

A monofilament that provides excellent adhesive strength to ABS, PLA, and nearly all 3D printing materials. Its proprietary water solubility qualities provide timely, pit-free dissolution away from the insoluble printed object. Use it as a support material to print large overhangs, intricate inner geometry, and deep cavities.

## Technical & Comparative Data



### Test Condition

Sample size: 30mm x 50mm x 2mm  
Water Temp: 40°C  
Water Volume: 2 Liters

| Property                                   | Value   |
|--|---------|
| Melt Flow Rate <sup>1</sup> (210°C, 2160g) | 20-30   |
| Volatile Matter (120°C, 3hr)               | .5% max |
| Melting Point <sup>2</sup>                 | 176°C   |

(1) Measured with Melt Indexer

(2) Measured with DSC, both heating and cooling speeds of 10°C/min

\* The above figures are representative values and are not guaranteed.

| Contents                          |                   | Unit              | HydroPro™   | Remark  |
|-----------------------------------|-------------------|-------------------|-------------|---|
| Tensile test                      | Break Point       | %                 | <b>9.0</b>  | ISO dumbbell Test speed: 10mm/min                                     |
|                                   | Tensile Strength  | MPa               | <b>45</b>   |   |
|                                   | Tensile modulus   | GPa               | <b>2.5</b>  |   |
| Flexural test                     | Flexural strength | MPa               | <b>71</b>   | JIS K 7171 Test speed: 2mm/min  |
|                                   | Flexural modulus  | Gpa               | <b>2.9</b>  |   |
| Density                           |                   | Kg/m <sup>3</sup> | <b>1.14</b> | JIS R 1620  |
| Izod impact test                  |                   | KH/m <sup>2</sup> | <b>1.7</b>  | ISO 180 (JIS K 7110) Notched  |
| Rockwell Hardness Test            |                   | HRR               | <b>109</b>  | JIS K 7202-2 R scale  |
| Deflection temperature under load |                   | °C                | <b>57</b>   | JIS K719101,02 / Bending stress: 1.8MPa<br>Temp. rising rate: 120°C/h |

## 3D Printer Settings

Since 3D-Fuel HydroPro™ is packed in a moisture-proof bag, pre-drying is not necessary. Pre-drying may cause contamination of other materials and thus small gel troubles in the extrusion process.

| Material supported | HydroPro™ Head Temp | Material Head Temp       | Bed Temp |
|--------------------|---------------------|--------------------------|----------|
| PLA                | 200°C               | 200°C (or as instructed) | 80°C     |
| ABS                | 210°C               | 235°C (or as instructed) | 100°C    |
| PETG               | 200°C               | 230°C (or as instructed) | 100°C    |
| NYLON (PA)         | 200°C               | 240°C (or as instructed) | 100°C    |

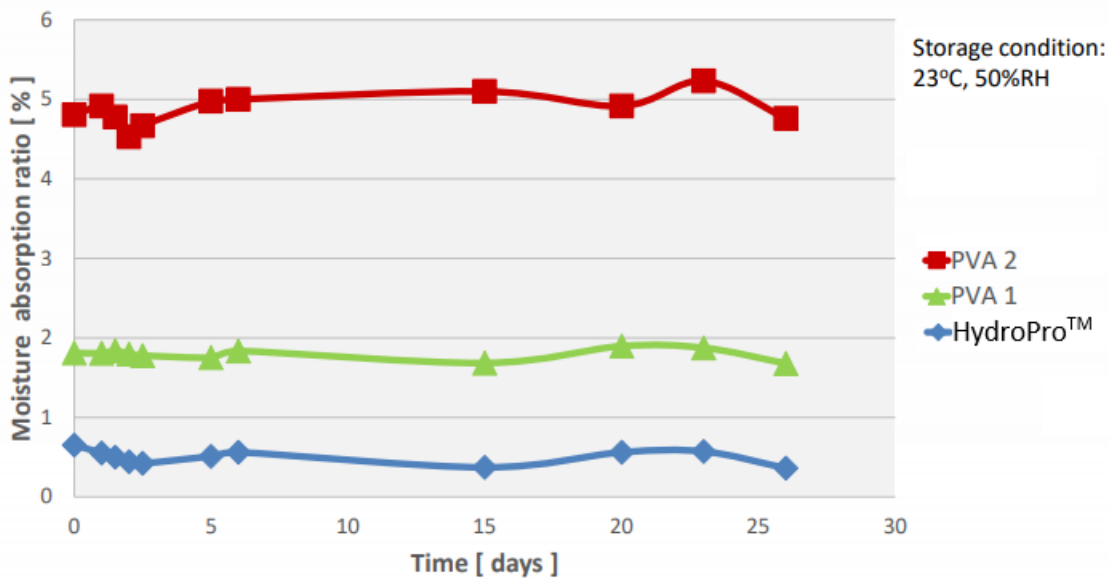
### General Printing Recommendations

Extruder: 210 - 230 C  
Build plate: 45 - 60 C  
Speeds: Start with your favorite PLA settings  
Retraction Distance: 1 - 10 mm  
Retraction Speed: 20 mm/s  
Bed Material: PEI, Buildtak recommended with a heated build plate (45-60° C)

### Handling and Storage

Store in a sealed container with desiccant. 3D-Fuel HydroPro™ is less moisture absorbing in a normal handling environment than conventional support filaments such as PVA and PVOH, so there is lesser chance of filament malformation or tactile-induced damage of HydroPro™ as you handle the spool. For maximum performance, however, care should always be taken to keep HydroPro™ in its vacuum-sealed bag or, once opened, the driest environment possible. HydroPro™ has less absorption in normal storage conditions than other soluble materials (see graphic below) but certainly more moisture absorption than most other constructive 3D printing materials. Allowing 3D-Fuel HydroPro™ to be exposed to high moisture environments may cause bubbling in the extrusion processes.

#### Moisture Absorbing Speed



### Dissolving

HydroPro™ only needs to be soaked for 1-2 hours to easily work supports off by hand, or 2-6 hours to dissolve completely.

### Biodegradability & Environmental Impact

HydroPro™ is non-toxic and fully biodegradable, meaning it can be rinsed down the drain without harming the environment or wildlife.

A safety data sheet is available on our website or upon request.