

Technical Data Sheet

Pro1 by Innofil3D BV

Filament suitable for all commercially available leading brands 3D FDM/FFF printers

IDENTIFICATION OF THE MATERIAL

Trade name	Pro1
Chemical name	Polylactic Acid compound
Chemical family	Compound of Polylactic Acid
Use	3D-Printing
Origin	Innofil3D BV

GUIDELINE FOR PRINT SETTINGS

Nozzle temperature	210 ± 10 °C
Bed temperature	Approx. 60 °C
Bed modification	Tape or glue below 60 °C
Active cooling fan	Yes
Layer height	0.08 – 0.2 mm
Shell thickness	0.4 – 0.8 mm
Print speed	40 - ≥ 150 mm/s

Settings are based on a 0.4 mm nozzle

MATERIAL PROPERTIES

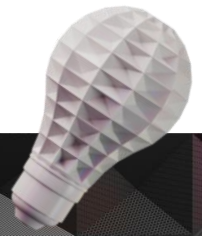
		Test Method
Melt temperature	170 – 180 °C	ASTM D3418
Glass transition temperature	~ 60 °C	ASTM D3418
Melt Flow Rate ¹	20.3 g/10min	ISO 1133
Melt Volume Rate ¹	18.5 cm ³ /10min	ISO 1133
Density	1.25 g/cm ³	ASTM D1505
Odor	Odorless	/
Solubility	Insoluble in water	/

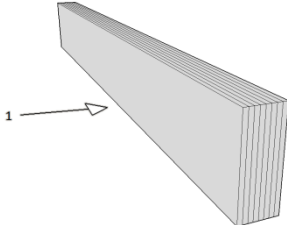
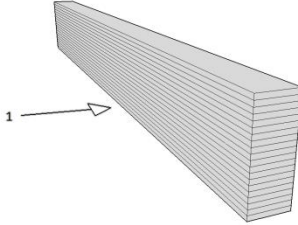
¹Test conditions: T = 210 °C; m = 2.16 kg



MECHANICAL PROPERTIES TENSILE TEST			Test Method	ISO 527
<p>All test specimens were printed using an Ultimaker 2+ under the following conditions: printing temperature: 210 °C heated bed temperature: 60 °C print speed: 40 mm/s number of shells: 2 Infill under 45°</p>	<p>Printed vertical (Z-axis)</p>		<p>Printed horizontal (X,Y-axis)</p>	
	Infill	50%	100%	50%
Tensile strength (MPa)	14.5 ± 0.8	21.8 ± 0.8	29.3 ± 0.2	48.0 ± 1.1
Force at break (MPa)	14.3 ± 0.8	21.3 ± 0.7	7.7 ± 2.7	9.7 ± 0.1
Elongation at max force (%)	0.8 ± 0.1	0.9 ± 0.1	2.6 ± 0.0	2.7 ± 0.1
Elongation at break (%)	0.8 ± 0.1	0.9 ± 0.1	8.7 ± 0.8	21.9 ± 2.9
Relative tensile strength (MPa/g)	1.4 ± 0.1	1.7 ± 0.1	3.0 ± 0.1	3.8 ± 0.1
Emodulus (MPa)	2111 ± 47	2930 ± 90	1993 ± 23	3166 ± 41

MECHANICAL PROPERTIES IMPACT TEST			Test Method	ISO 179
<p>All test specimens were printed using an Ultimaker 2+ under the following conditions: printing temperature: 210 °C heated bed temperature: 60 °C print speed: 40 mm/s number of shells: 2 Infill under 45° 1 →: impact direction</p>	<p>Charpy (en)</p>		<p>Charpy (ep)</p>	
	Infill	100%	100%	100%
Impact strength (kJ/m ²)	18.8 ± 0.7	20.4 ± 0.6	20.4 ± 0.6	20.4 ± 0.6
Impact energy (mJ)	755.4 ± 27.3	813.1 ± 2.1	813.1 ± 2.1	813.1 ± 2.1



MECHANICAL PROPERTIES FLEXURAL TEST		Test Method	ISO 178
<p>All test specimens were printed using an Ultimaker 2+ under the following conditions: printing temperature: 210 °C heated bed temperature: 60 °C print speed: 40 mm/s number of shells: 2 Infill under 45° 1 →: bending direction</p>	 <p>Normal</p>	 <p>Parallel</p>	
	Infill	100%	100%
Flexural modulus (MPa)	2822.5 ± 74.0	2340.2 ± 87.9	
Maximum force (MPa)	92.4 ± 0.9	99.1 ± 1.8	
Deformation (%)	4.3 ± 0.1	4.4 ± 0.1	

FILAMENT SPECIFICATIONS		Test Method
Diameter 1.75	1.75 ± 0.05 mm	Innofil3D
Diameter 2.85	2.85 ± 0.10 mm	Innofil3D
Max. roundness deviation 1.75	0.05 mm	Innofil3D
Max. roundness deviation 2.85	0.10 mm	Innofil3D
Net weight on reel	750 g ± 2%	Innofil3D



LIST OF COLORS AND CERTIFICATIONS*

Colour	Code	RAL nr.	Certifications/approvals			
			10/2011 ¹	FDA ²	2011/65 ³	EN 71-3 ⁴
Black	7502	9005	Yes	Yes	Yes	Yes
White	7503	9010	Yes	Yes	Yes	Yes
Silver	7521	9006	Yes	Yes	Yes	Yes

* This overview is generated using information obtained from the raw material suppliers.

Certifications/approvals	Description
¹ Regulation EU No 10/2011:	Union Guidelines on Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food (Europe)
² FDA:	Food and Drug administration approval (U.S.A.)
³ Directive 2011/65/EU:	The restriction of the use of certain hazardous substances in electrical and electronic equipment (Europe)
⁴ Directive 2009/48/EC; EN 71-3:	Safety of toys – Part 3: Migration of certain elements (Europe)

Part number	Colour	Diameter	Weight
10798	Natural White	1.75mm	750g
10799	Natural White	2.85mm	750g
10800	Black	1.75mm	750g
10801	Black	2.85mm	750g
10802	Silver	1.75mm	750g
10803	Silver	2.85mm	750g
10998	Grey	1.75mm	750g
10999	Grey	2.85mm	750g