

# 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	~ 63 °C	ASTM D3418
Melt Flow Rate <sup>1</sup>	27.5 g/10min	ISO 1133
Melt Volume Rate <sup>1</sup>	18.2 cm <sup>3</sup> /10min	ISO 1133
Density	1.25 g/cm <sup>3</sup>	ASTM D1505
Odor	Odorless	/
Solubility	Insoluble in water	/

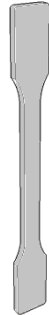
<sup>1</sup>Test conditions: T = 210 °C; m = 2.16 kg



### MECHANICAL PROPERTIES | TENSILE TEST

Test Method ISO 527

All test specimens were printed using an 2.85 mm filament printer 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°



Printed vertical (Z-axis)



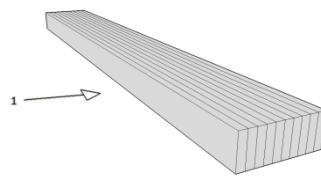
Printed horizontal (X,Y-axis)

	Printed vertical (Z-axis)		Printed horizontal (X,Y-axis)	
	50%	100%	50%	100%
Tensile strength (MPa)	14.5	21.8	29.3	48.0
Force at break (MPa)	14.3	21.3	7.7	9.7
Elongation at max force (%)	0.8	0.9	2.6	2.7
Elongation at break (%)	0.8	0.9	8.7	21.9
Relative tensile strength (MPa/g)	1.4	1.7	3.0	3.8
Emodulus (MPa)	2111	2930	1993	3166

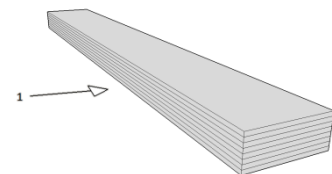
### MECHANICAL PROPERTIES | IMPACT TEST

Test Method ISO 179

All test specimens were printed using an 2.85 mm filament printer 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

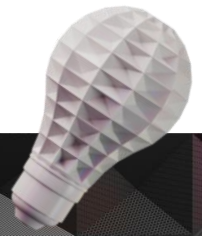


Charpy (en)



Charpy (ep)

	Charpy (en)	Charpy (ep)
Infill	100%	100%
Impact strength (kJ/m <sup>2</sup> )	18.8	20.4
Impact energy (mJ)	755.4	813.1



MECHANICAL PROPERTIES   FLEXURAL TEST		Test Method	ISO 178
<p>All test specimens were printed using an 2.85 mm filament printer under the following conditions:</p> <p>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)	2823	2340
	Maximum force (MPa)	92.4	99.1
	Deformation (%)	4.3	4.4

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 <sup>1</sup>	FDA <sup>2</sup>	2011/65 <sup>3</sup>	EN 71-3 <sup>4</sup>
Natural White	7501	N/A	Yes	Yes	Yes	Yes
Black	7502	9005	Yes	Yes	Yes	Yes
Grey	7523	7045	Yes	No	Yes	Yes

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

Certifications/approvals	Description
<sup>1</sup> 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)
<sup>2</sup> FDA:	Food and Drug administration approval (U.S.A.)
<sup>3</sup> Directive 2011/65/EU:	The restriction of the use of certain hazardous substances in electrical and electronic equipment (Europe)
<sup>4</sup> Directive 2009/48/EC; EN 71-3:	Safety of toys – Part 3: Migration of certain elements (Europe)