

IDENTIFICATION OF THE MATERIAL

Trade name	PLA PRO
Chemical name	Polylactic acid compound
Chemical family	Compound of polylactic acid
Use	3D printing
Brand	3dcolors

GUIDELINE FOR PRINT SETTINGS - Settings are based on a 0.4 mm nozzle

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

MATERIAL PROPERTIES

		Test Method
Melt temperature	170 - 180 °C	ASTM D3418
Glass transition temperature	~ 60 °C	ASTM D3418
Melt flowrate*	20.3 g/10 min	ISO 1133
Melt volume rate*	18.5 cm ³ /10 min	ISO 1133
Density	1.25 g/cm ³	ASTM D1505
Odor	Odorless	/
Solubility	Insoluble in water	/

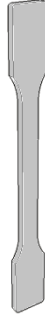
*Test conditions T = 210 °C ; m = 2.16 kg

Think it, make it!

MECHANICAL PROPERTIES - TENSILE TEST - ISO 527

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%



Printed vertical (Z axis)



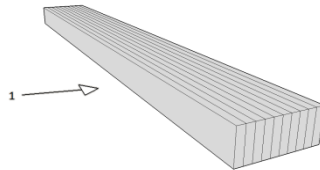
Printed horizontal (X/Y axis)

Infill	50%	100%	50%	100%
Tensile strenght (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 strenght (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

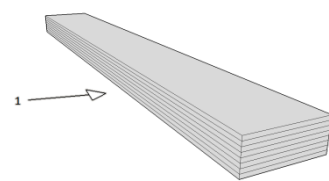
MECHANICAL PROPERTIES - IMPACT TEST - ISO 179

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%



Charpy (en)



Charpy (ep)

Impact direction →

Infill	100%	100%
Tensile strenght (Mpa)	18.8 ± 0.8	20.4 ± 0.6
Force at break (Mpa)	755.4 ± 27.3	813.1 ± 2.1

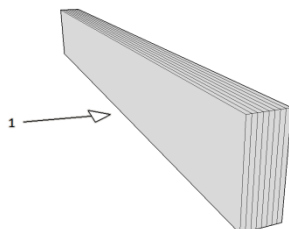
Think it, make it

MECHANICAL PROPERTIES - FLEXURAL TEST - ISO 178

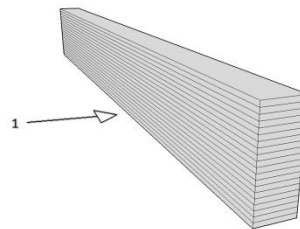
All test specimens were printed using an Ultimaker 2 + under the following conditions:

printing temperature: 210 °C
heated bed temperature: 60 °C
print speed: 40 mm/s
number of shells: 2
infill under 45%

bending direction →



normal



parallel

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 AND TOLERANCE

Diameter 1.75	1.75 ± 0.05 mm
Max. roundness deviation 1.75	0.05 mm
Net weight on reel	750 g ± 2%

LIST OF COLORS AND CERTIFICATIONS*

Colour	Code	RAL	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	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)

Think it, make it