polymaker

Innovators in 3D printing

Technical Data Sheet

PolyTerra™ PLA

www.polymaker.com

V5.0

PolyTerra™ PLA

PolyTerra™ PLA is a bioplastic based 3d printing filament designed from the ground up to create the next generation of PLA, providing ease of use, printing quality, speed and reliability.

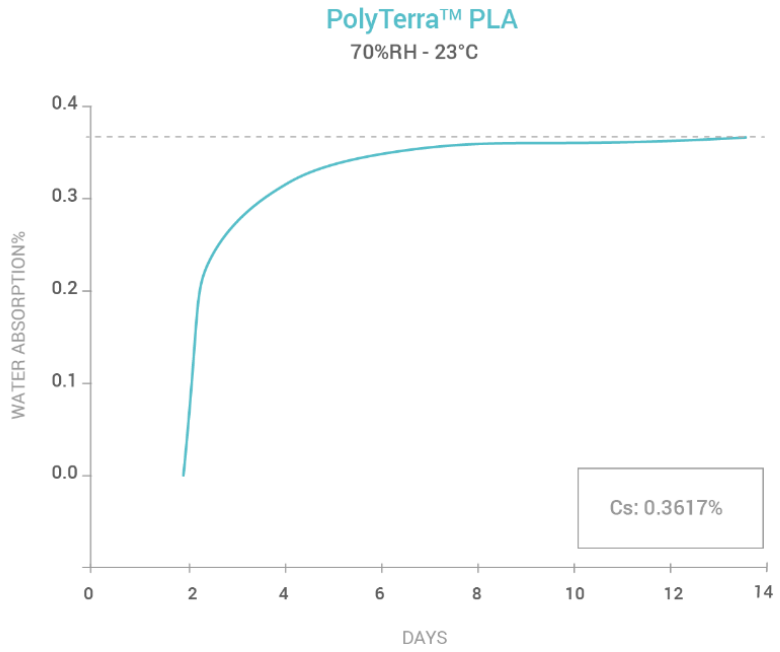
PHYSICAL PROPERTIES

Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.31±0.02 g/cm^3 at 21°C
Melt Index	210°C, 2.16kg	14-20 g/10min
Light Transmission	N/A	N/A

CHEMICAL RESISTANT DATA

Property	Testing Method
Effect of weak acids	Not Resistant
Effect of strong acids	Not Resistant
Effect of weak alkalis	Not Resistant
Effect of strong alkalis	Not Resistant
Effect of organic solvent	No data available
Effect of oils and grease	No data available
Effect of Sunlight	No data available

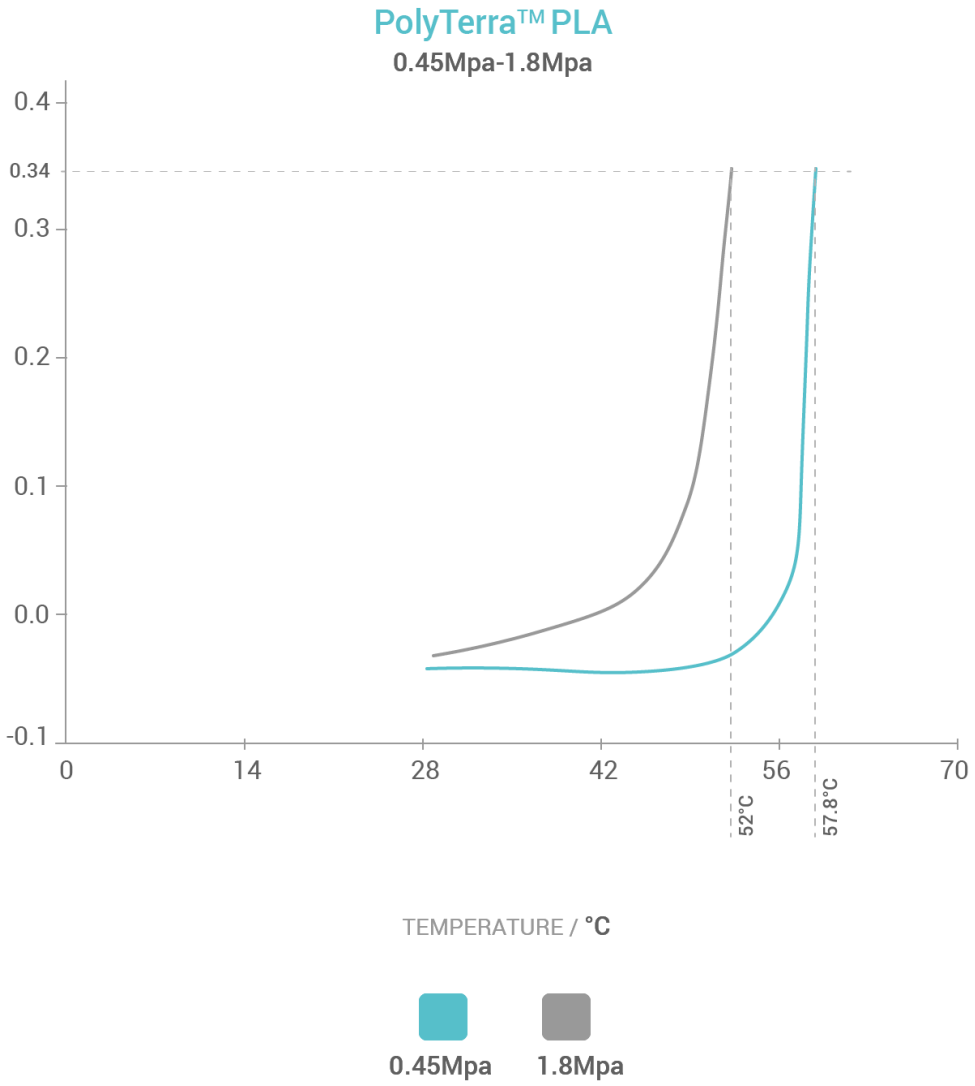
MOISTURE ABSORPTION CURVE



THERMAL PROPERTIES

Property	Testing Method	Typical Value
Glass transition	DSC, 10°C/min	60.6 °C
Melting temperature	DSC, 10°C/min	162.6 °C
Decomposition temperature	TGA, 20°C/min	N/A
Vicat softening temperature	ISO 306 GB/T 1633	62.7 °C
Heat deflection temperature	ISO 75 1.8MPa	°C
Heat deflection temperature	ISO 75 0.45MPa	°C
Thermal conductivity	N/A	N/A
Heat shrinkage rate	N/A	N/A

HDT CURVE



MECHANICAL PROPERTIES

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	1882 ± 141 MPa
Young's modulus (Z)		1869.7±38
Tensile strength (X-Y)	ISO 527, GB/T 1040	20.9 ± 2.0 MPa
Tensile strength (Z)		18.0 ± 0.3 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	34.5 ± 8.1 %
Elongation at break (Z)		2.51 ± 0.83
Bending modulus (X-Y)	ISO 178, GB/T 9341	2695 ± 541 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	39.6 ± 1.1 MPa
Bending strength (Z)		N/A
Charpy impact strength (X-Y)	ISO 179, GB/T 9343	5.7 ± 0.4 kj/m^2
Charpy impact strength (Z)		N/A

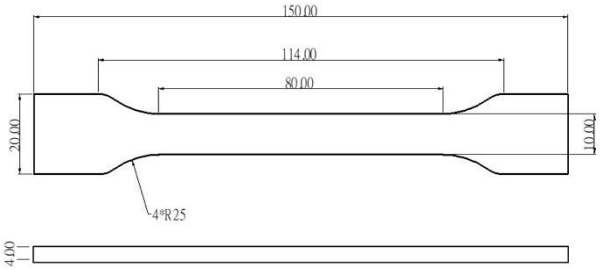
RECOMMENDED PRINTING CONDITIONS

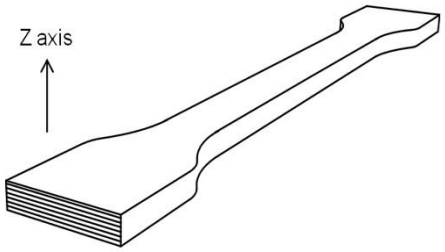
Parameter	
Nozzle temperature	190 – 230 (℃)
Build Surface material	BuildTak®, Glass, Blue Tape
Build surface treatment	Glue, Magigoo
Build plate temperature	25 - 60 (˚C)
Cooling fan	Turned on
Printing speed	30-70 (mm/s)
Raft separation distance	0.2 (mm)
Retraction distance	1 (mm)
Retraction speed	20 (mm/s)
Environmental temperature	Room temperature - 60 (˚C)
Threshold overhang angle	60 (˚)
Recommended support material	PolySupport™ and PolyDissolve™ S1

* Based on 0.4 mm nozzle and Simplify 3D v.4.0. Printing conditions may vary with different nozzle diameters

TENSILE TESTING SPECIMEN

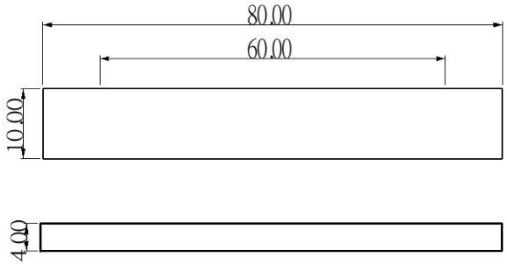
ASTM D638 (ISO 527, GB/T 1040)

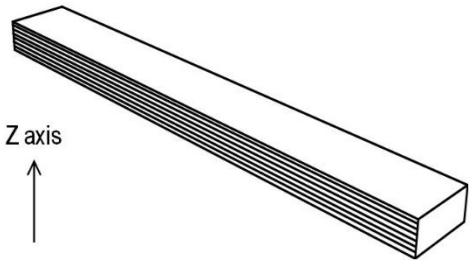




FLEXURAL TESTING SPECIMEN

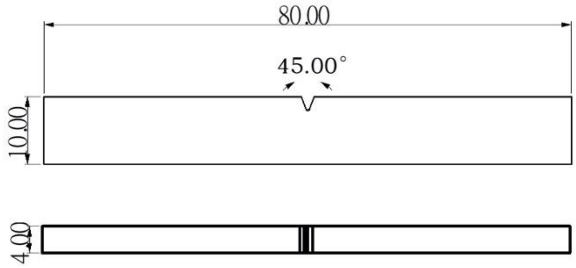
ASTM D638 (ISO 527, GB/T 1040)

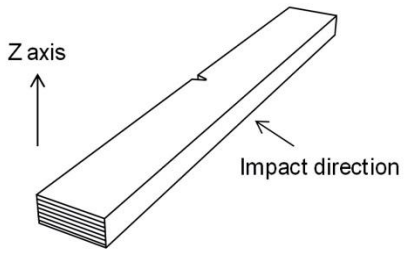




IMPACT TESTING SPECIMEN

ASTM D638 (ISO 179, GB/T 1043)





HOW TO MAKE SPECIMENS

Printing temperature	200 °C
Bed temperature	60 °C
Shell	2
Top & bottom layer	4
Infill	100%
Environmental temperature	25 °C
Cooling fan	ON

*All specimens were conditioned at room temperature for 24h prior to testing

DISCLAIMER:

The typical values presented in this data sheet are intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. Actual values may vary significantly with printing conditions. End- use performance of printed parts depends not only on materials, but also on part design, environmental conditions, printing conditions, etc. Product specifications are subject to change without notice.

Each user is responsible for determining the safety, lawfulness, technical suitability, and disposal/ recycling practices of Polymaker materials for the intended application. Polymaker makes no warranty of any kind, unless announced separately, to the fitness for any use or application. Polymaker shall not be made liable for any damage, injury or loss induced from the use of Polymaker materials in any application.