polymaker

Innovators in 3D printing

Technical Data Sheet

PolyMax™ PLA

www.polymaker.com

V5.1

PolyMax™ PLA

PolyMax™ PLA is an incredibly easy-to-print filament with improved mechanical properties, making it an excellent alternative to ABS.

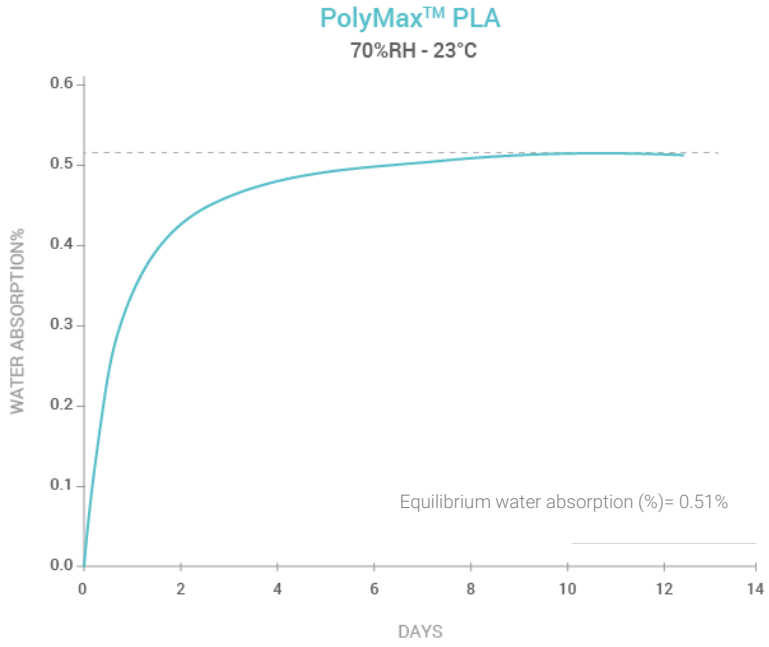
PHYSICAL PROPERTIES

Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.17-1.24 g/cm^3 at 23°C
Melt index	210°C, 2.16kg	5-8 g/10min
Light transmission	N/A	N/A
Flame retardancy	N/A	N/A

CHEMICAL RESISTANCE 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

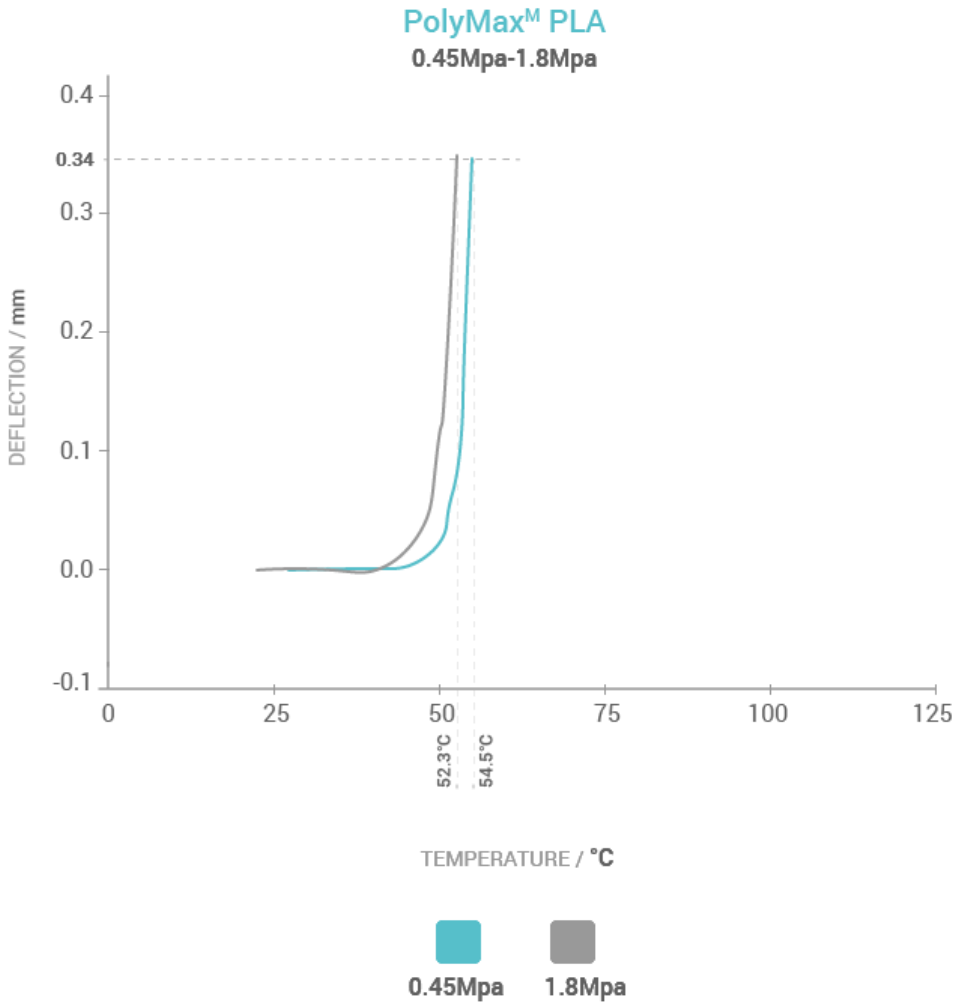
MOISTURE ABSORPTION CURVE



THERMAL PROPERTIES

Property	Testing Method	Typical Value
Glass transition temperature	DSC, 10°C/min	61 °C
Melting temperature	DSC, 10°C/min	148.7 °C
Crystallization temperature	DSC, 10°C/min	111.7 °C
Decomposition temperature	TGA, 20°C/min	N/A
Vicat softening temperature	ISO 306, GB/T 1633	62.4 °C
Heat deflection temperature	ISO 75 1.8MPa	52.3 °C
Heat deflection temperature	ISO 75 0.45MPa	54.5 °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	1879 ± 109 MPa
Young's modulus (Z)		1405 ± 141 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	28.1 ± 1.3 MPa
Tensile strength (Z)		20.2 ± 0.3 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	1.90 ± 0.21 %
Elongation at break (Z)		1.36 ± 0.3 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2119 ± 60 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	48 ± 1.9 MPa
Bending strength (Z)		N/A
Charpy impact strength (X-Y)	ISO 179, GB/T 1043	12.1 ± 1.0kJ/m^2
Charpy impact strength (Z)		N/A

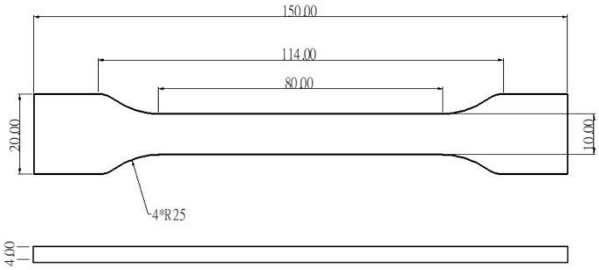
RECOMMENDED PRINTING CONDITIONS

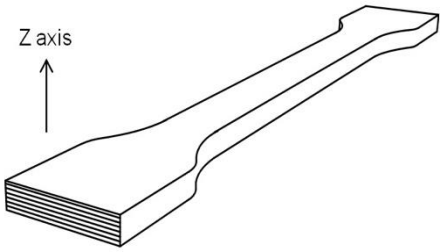
* Based on 0.4 mm nozzle and Simplify 3D v.4.0. Printing conditions may vary with different nozzle diameters

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	ON
Printing speed	40-60 (mm/s)
Raft separation distance	0.2 (mm)
Retraction distance	1 (mm)
Retraction speed	20 (mm/s)
Environmental temperature	Room temperature
Threshold overhang angle	60 (˚)
Recommended support material	PolySupport™ and PolyDissolve™ S1

TENSILE TESTING SPECIMEN

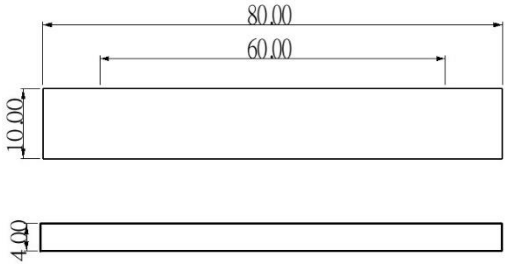
ISO 527, GB/T 1040

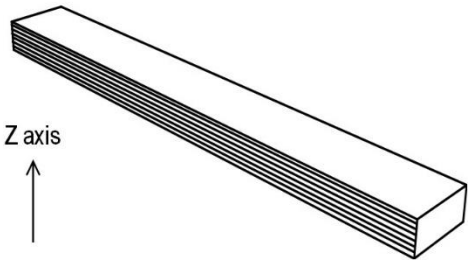




FLEXURAL TESTING SPECIMEN

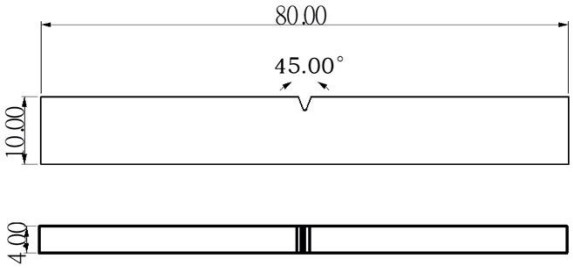
ISO 178, GB/T 9341

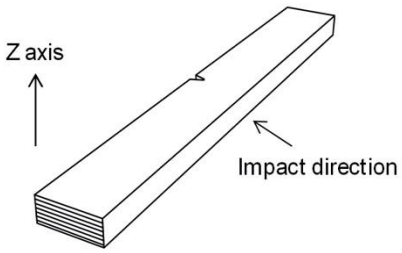




IMPACT TESTING SPECIMEN

ISO 179, GB/T 1043





HOW TO MAKE SPECIMENS

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

Printing temperature	205 °C
Bed temperature	50 °C
Shell	2
Top & bottom layer	4
Infill	100%
Environmental temperature	25 °C
Cooling fan	ON

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.