polymaker

Innovators in 3D printing

Technical Data Sheet

Polymaker™ HT-PLA

www.polymaker.com

V1.0

Polymaker™ HT-PLA

Polymaker™ HT-PLA sets a new standard for heat-stable 3D printing, maintaining its shape at high temperatures (up to 130°C) without sagging or deforming under its own weight. Enjoy the ease of printing and eco-friendliness of PLA—no post-processing required.

PHYSICAL PROPERTIES

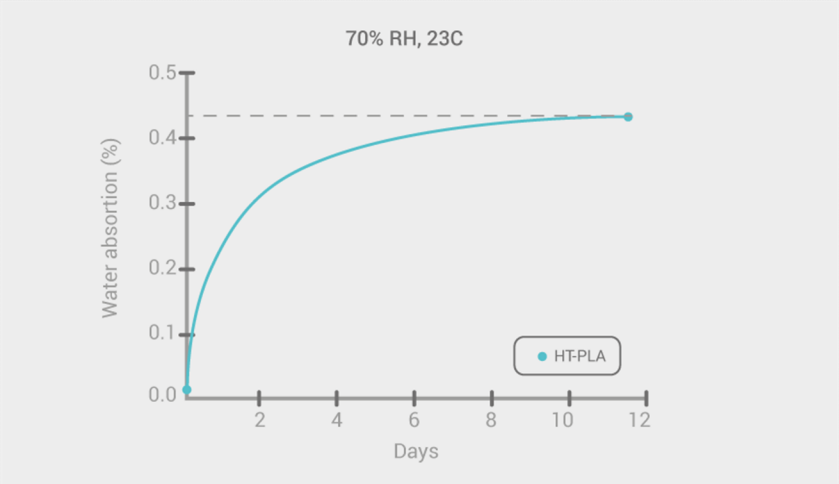
Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.287 g/cm3 at 23°C
Melt index	210°C, 2.16 kg	22.6 g/10min
Light transmission	N/A	N/A
Flame retardancy	N/A	N/A

CHEMICAL RESISTANCE DATA

Property	Typical Value
Effect of weak acids	Good
Effect of strong acids	Poor
Effect of weak alkalis	Fair
Effect of strong alkalis	Poor
Effect of oils and grease	Good

Note:
Good: Material may get minor attack after long periods of storage with chemical at ambient temperature
Fair: Material can be used for short time contact with chemicals at ambient temperature
Poor: Material becomes unstable on contact with chemical at ambient temperature

MOISTURE ABSORPTION CURVE



ENVIRONMENTAL PERFORMANCE

Property	Typical Value
Hydrothermal aging	N/A
UV aging	N/A

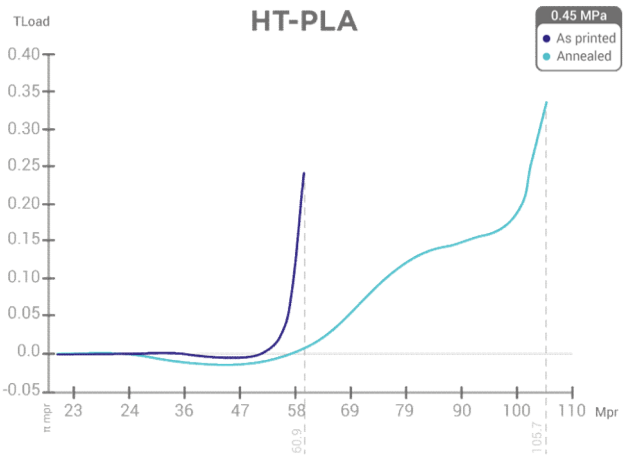
DIMENSIONAL STABILITY

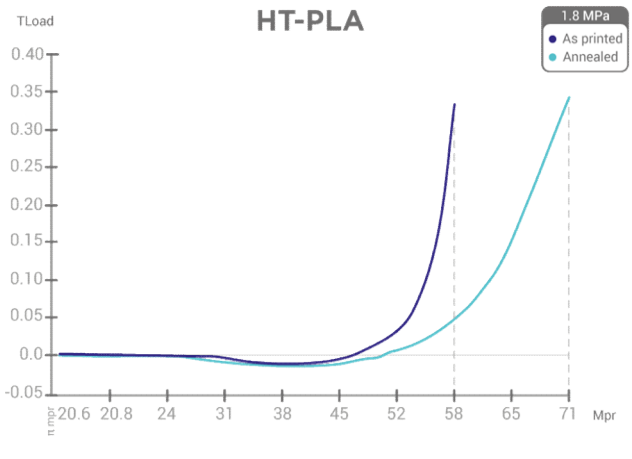
Property	Typical Value
Shrinkage (X-Y)	0.88%
Shrinkage (Z)	0.13%
Shrinkage (D)	0.52%

THERMAL PROPERTIES

Property	Testing Method	Typical Value	
Glass transition temperature	DSC, 10°C/min	59.8°C	
Melting temperature	DSC, 10°C/min	177.23°C	
Crystallization temperature	DSC, 10°C/min	77.21°C	
Decomposition temperature	TGA, 20°C/min	335.94°C	
Vicat softening temperature	ISO 306, GB/T 1633	152°C	(as printed)
Heat deflection temperature	ISO 75 1.8MPa	57.2°C	(as printed)
Heat deflection temperature	ISO 75 0.45MPa	69.9°C	(as printed)
Vicat softening temperature	ISO 306, GB/T 1633	153.2°C	(annealed)
Heat deflection temperature	ISO 75 1.8MPa	59.9°C	(annealed)
Heat deflection temperature	ISO 75 0.45MPa	106.5°C	(annealed)

HDT CURVE





MECHANICAL PROPERTIES (as printed)

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	2945.75±77.35 MPa
Young's modulus (Z)		2596.43±160.44 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	42.86±0.76 MPa
Tensile strength (Z)		20.83±0.51 Mpa
Elongation at break (X-Y)	ISO 527, GB/T 1040	2.80±0.26 %
Elongation at break (Z)		0.97±0.05 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2893.46±53.15 MPa
Bending modulus (Z)		2411.22±139.22 MPa
Bending strength (X-Y)	ISO 178, GB/T 9341	74.04±0.66 MPa
Bending strength (Z)		29.39±1.18 Mpa
Notched Charpy impact strength (X-Y)	ISO 179, GB/T 1043	4.94±0.31 kJ/m2
Notched Charpy impact strength (Z)		4.50±0.11 kJ/m2

MECHANICAL PROPERTIES (after annealing)

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	3267.16±66.41 MPa
Young's modulus (Z)		2596.43±160.44 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	42.86±0.76 MPa
Tensile strength (Z)		18.82±0.98 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	1.87±0.09 %
Elongation at break (Z)		0.81±0.08 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2960.42±46.91 MPa
Bending modulus (Z)		2411.22±139.22 MPa
Bending strength (X-Y)	ISO 178, GB/T 9341	66.75±0.51 MPa
Bending strength (Z)		28.95±1.44 MPa
Notched Charpy impact strength (X-Y)	ISO 179, GB/T 1043	4.67±0.20 kJ/m2
Notched Charpy impact strength (Z)		4.39±0.18 kJ/m2

RECOMMENDED PRINTING CONDITIONS

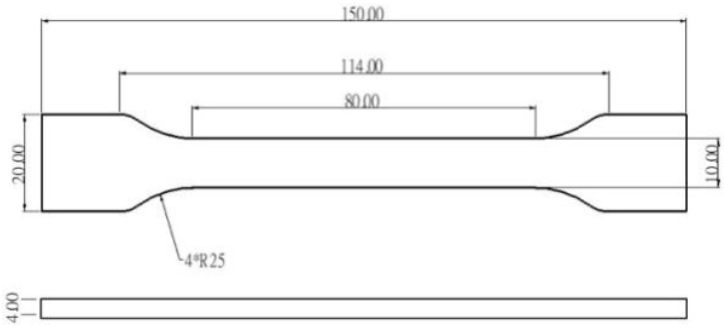
Parameter	
Nozzle temperature	210-230 (°C)
Build surface treatment	PC and Texture PEI (Glue when needed)
Build plate temperature	25-60 (°C)
Cooling fan	ON
Printing speed	Up to 300 (mm/s)
Retraction distance	1-3 (mm)
Retraction speed	20-40 (mm/s)
Closure chamber	Not needed
Recommended support material	-
Drying setting	60°C for 6h
Annealing setting	See note.

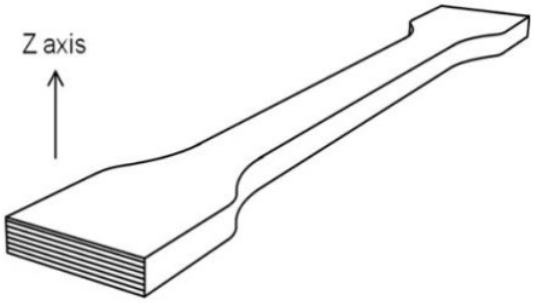
*Based on 0.4mm nozzle. Printing conditions may vary with different nozzle diameters.

Note:
For higher temperature stability, you can anneal this material for 3 minutes @ 80-90°C.

TENSILE TESTING SPECIMEN

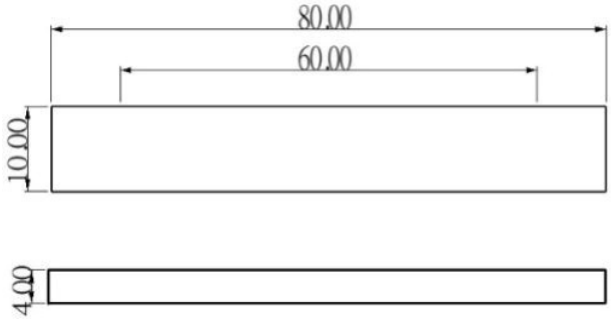
ISO 527, GB/T 1040

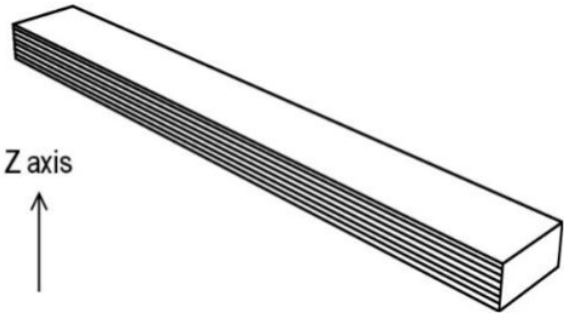




FLEXURAL TESTING SPECIMEN

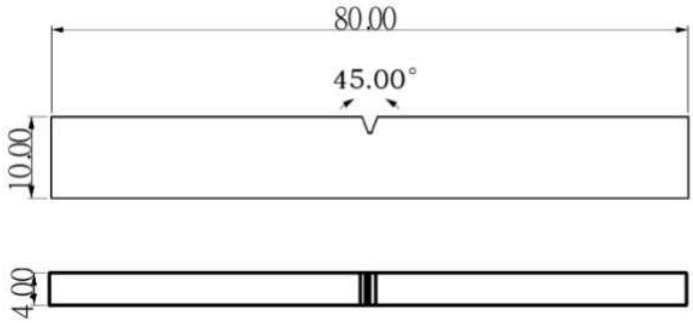
ISO 178, GB/T 9341

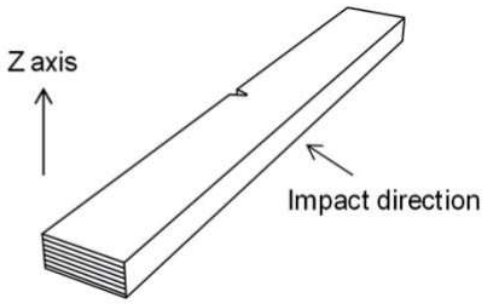




IMPACT TESTING SPECIMEN

ISO 179, GB/T 1043





HOW TO MAKE SPECIMENS

Printing temperature	230°C
Bed temperature	50°C
Shell	2
Top & bottom layer	3
Infill	100%
Environmental temerature	Ambient temperature
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.

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