

## Technical Data Sheet

# PolySonic™ PLA Pro

[www.polymaker.com](http://www.polymaker.com)

V5.3



PolySonic™ PLA PRO is a tough PLA that can print at incredible speeds. With its advanced formulation, this filament ensures durable, rugged prints, with an impact strength similar to ABS and bending strength outperforming ASA & PETG. When time is of the essence for functional parts, PLA PRO is the ideal choice for you.

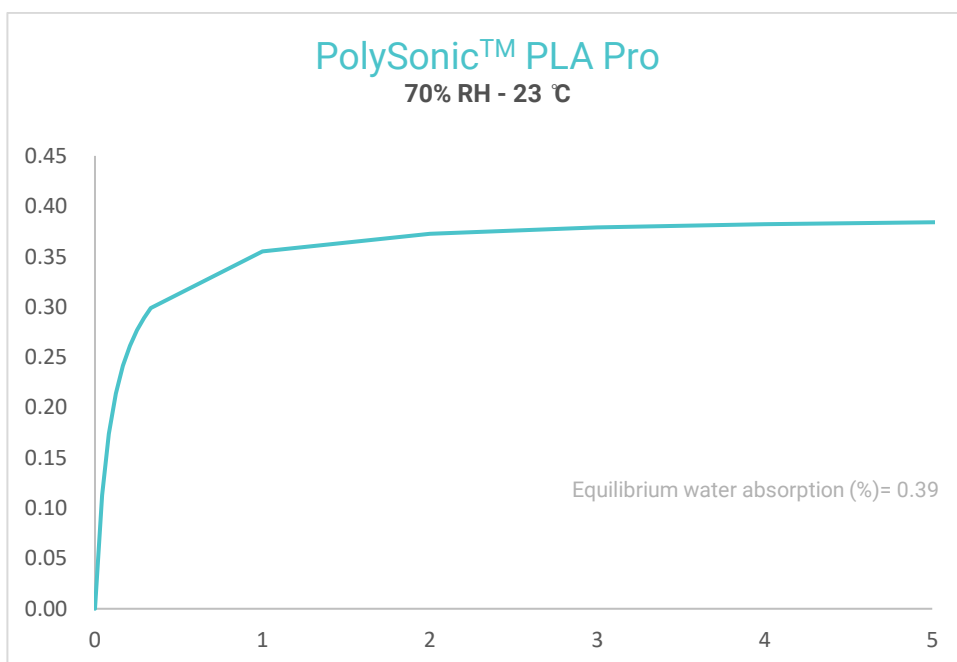
### PHYSICAL PROPERTIES

Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.23 g/cm <sup>3</sup> at 21.5°C
Melt index	210°C, 2.16 kg	15.5 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



## THERMAL PROPERTIES

Property	Testing Method	Typical Value
Glass transition temperature	DSC, 10°C/min	61 °C
Melting temperature	DSC, 10°C/min	164 °C
Crystallization temperature	DSC, 10°C/min	96 °C
Decomposition temperature	TGA, 20°C/min	370 °C
Vicat softening temperature	ISO 306, GB/T 1633	61 °C
Heat deflection temperature	ISO 75 1.8MPa	52 °C
Heat deflection temperature	ISO 75 0.45MPa	55 °C
Thermal conductivity	N/A	N/A
Heat shrinkage rate	N/A	N/A

## MECHANICAL PROPERTIES - Classic Speed

\* Based on 0.4 mm nozzle and 0.2mm layer thickness. Classic printing speed = 46.7mm/s, printing temperature = 210 °C

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	2360.0 ± 30.1 MPa
Young's modulus (Z)		2283.3 ± 32.1 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	41.2 ± 0.6 MPa
Tensile strength (Z)		33.6 ± 0.5 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	23.4 ± 6.3 %
Elongation at break (Z)		4.9 ± 1.1 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2688.7 ± 26.1 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	67.5 ± 0.7 MPa
Bending strength (Z)		N/A
Charpy impact strength (X-Y)	ISO 179, GB/T 1043	22.7 ± 2.5 kJ/m <sup>2</sup>
Charpy impact strength (Z)		N/A

## MECHANICAL PROPERTIES - High Speed

\* Based on 0.4 mm nozzle and 0.2mm layer thickness. High printing speed = 300mm/s, printing temperature = 230 °C

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	2305.7 ± 42.9 MPa
Young's modulus (Z)		2102.9 ± 74.3 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	39.3 ± 0.5 MPa
Tensile strength (Z)		31.9 ± 0.5 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	17.9 ± 5.2 %
Elongation at break (Z)		3.8 ± 0.2 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2544.5 ± 27.0 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	64.1 ± 0.6 MPa
Bending strength (Z)		N/A
Charpy impact strength (X-Y)	ISO 179, GB/T 1043	19.4 ± 3.4 kJ/m <sup>2</sup>
Charpy impact strength (Z)		N/A

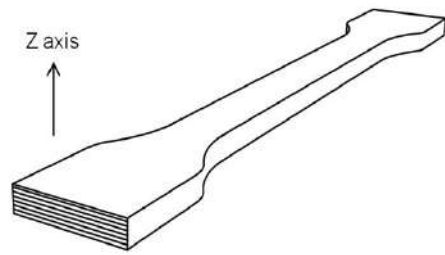
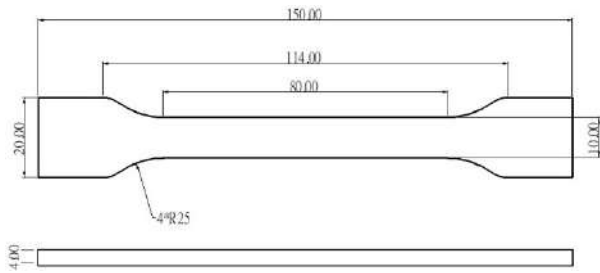
## RECOMMENDED PRINTING CONDITIONS

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

Parameter	
Nozzle temperature	Classic :190-210 °C High-speed: 210-230 °C
Build surface treatment	Glue when needed
Build plate temperature	30 - 60 (°C)
Cooling fan	100%
Printing speed	Classic :50-100mm/s High-speed: 100-300mm/s
Retraction distance	0.5 - 3 (mm)
Retraction speed	30 - 60 (mm/s)
Closure Chamber	No needed
Recommended support material	PolySupport™ and PolyDissolve™ S1
Drying setting	55°C for 6h

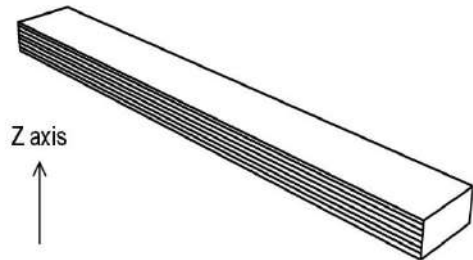
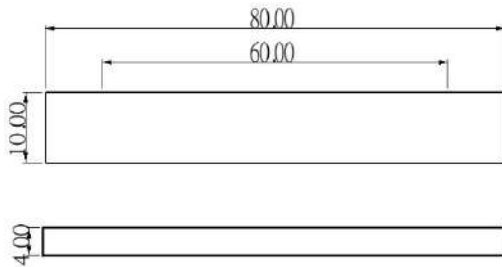
## TENSILE TESTING SPECIMEN

ISO 527, GB/T 1040



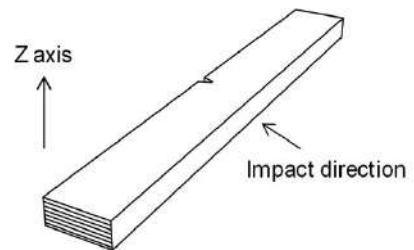
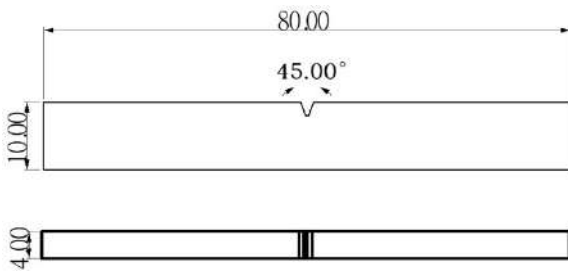
## FLEXURAL TESTING SPECIMEN

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	210 °C/230 °C
Bed temperature	25 °C
Shell	2
Top & bottom layer	3
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.