

Technical Data Sheet

PolySonic™ PLA

www.polymaker.com

V5.4



PolySonic™ PLA is a revolutionary high-speed 3D printing filament, the ultimate game-changer in additive manufacturing. With its lightning-fast extrusion rate, cutting-edge precision, and exceptional layer adhesion you can ramp up the speed of your 3D printer and witness new levels of productivity. Accelerate your workflow without compromising on strength or quality.

PHYSICAL PROPERTIES

Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.23 g/cm ³ at 21.5°C
Melt index	210°C, 2.16 kg	15.4 g/10min
Light transmission	N/A	N/A
Flame retardancy	N/A	N/A

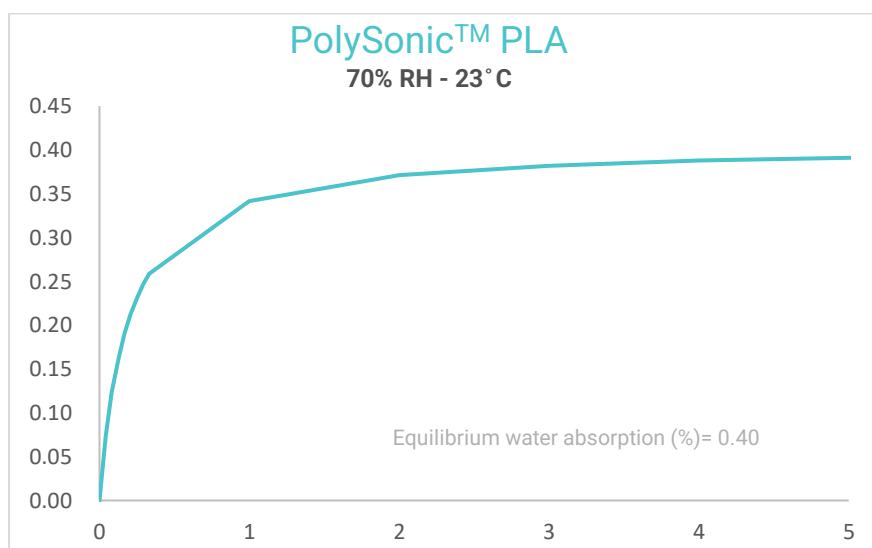
CHEMICAL RESISTANCE DATA

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 chemical at ambient temperature
- Poor: Material becomes unstable on contact with chemical at ambient temperature

MOISTURE ABSORPTION



THERMAL PROPERTIES

Property	Testing Method	Typical Value
Glass transition temperature	DSC, 10°C/min	59 °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	53 °C

MECHANICAL PROPERTIES – Classic Speed

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	2878.3 ± 74.3 MPa
Young's modulus (Z)		2689.8 ± 92.0 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	46.0 ± 0.5 MPa
Tensile strength (Z)		37.3 ± 0.7 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	21.5 ± 5.1 %
Elongation at break (Z)		4.2 ± 2.0 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2868.2 ± 78.4 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	76.5 ± 0.9 MPa
Bending strength (Z)		N/A
Notched Charpy impact strength (X-Y)	ISO 179, GB/T 1043	6.1 ± 0.6 kJ/m ²
Notched Charpy impact strength (Z)		N/A

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

MECHANICAL PROPERTIES – High Speed

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	2649.7 ± 78.3 MPa
Young's modulus (Z)		2433.4 ± 79.4 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	43.9 ± 0.4 MPa
Tensile strength (Z)		32.4 ± 0.4 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	15.1 ± 3.9 %
Elongation at break (Z)		3.3 ± 0.5 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2797.9 ± 40.7 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	71.4 ± 0.6 MPa
Bending strength (Z)		N/A
Notched Charpy impact strength (X-Y)	ISO 179, GB/T 1043	5.0 ± 0.5 kJ/m ²
Notched Charpy impact strength (Z)		N/A

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

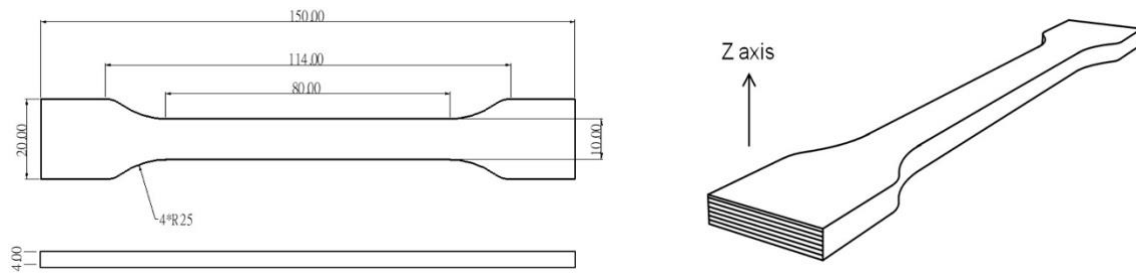
RECOMMENDED PRINTING CONDITIONS

Parameter	
Nozzle temperature	Classic :190-210 °C High-speed: 210-230 °C
Build surface treatment	PC and Texture PEI (Glue when needed)
Build plate temperature	30 - 60 (°C)
Cooling fan	ON
Printing speed	Classic :50-100mm/s High-speed: 100-300mm/s
Retraction distance	1 - 3 (mm)
Retraction speed	20 - 40 (mm/s)
Closure Chamber	No Needed
Recommended support material	PolySupport™ and PolyDissolve™ S1
Drying setting	55°C for 6h

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

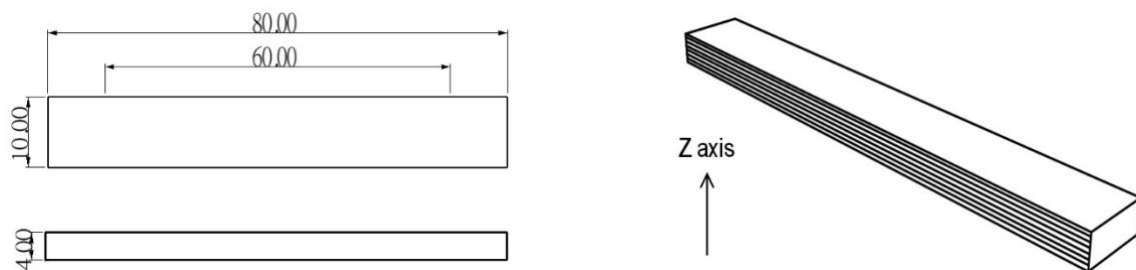
TENSILE TESTING SPECIMEN

ISO 527, GB/T 1040



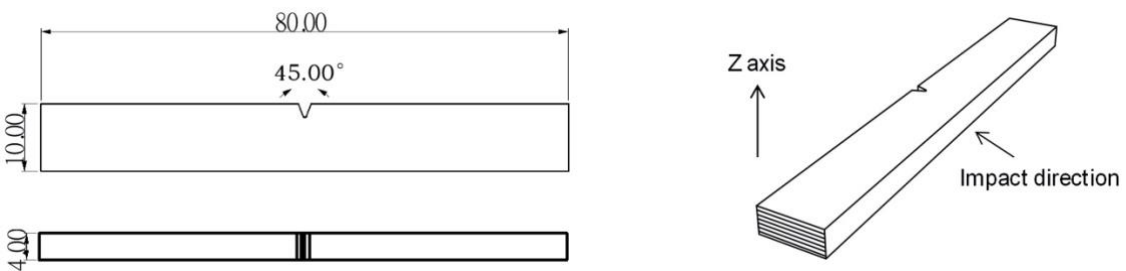
FLEXURAL TESTING SPECIMEN

ISO 178, GB/T 9341



IMPACT TESTING SPECIMEN

ISO 179, GB/T 1043



HOW TO MAKE SPECIMENS

Printing temperature	210 °C/230 °C
Bed temperature	50 °C
Shell	2
Top & bottom layer	3
Infill	100 %
Environmental temperature	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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