

## Technical Data Sheet

# PolyCast™

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

V5.1



**PolyCast™**

PolyCast™ is a filament designed to produce investment patterns for investment casting applications. 3D printing significantly cuts down both the cost and lead time by eliminating the tooling process.

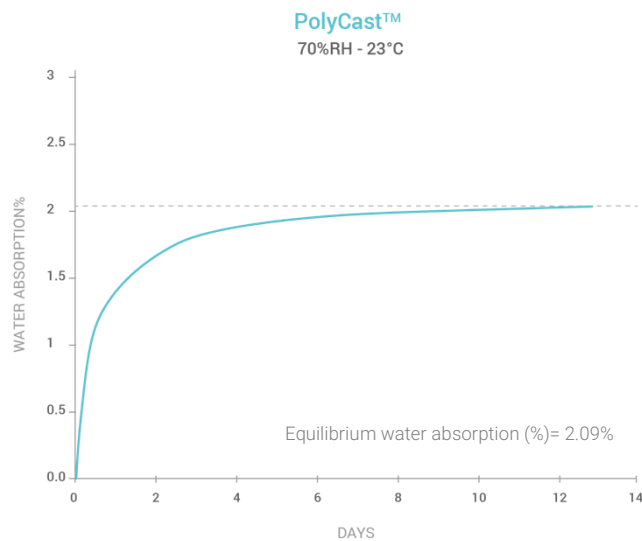
### PHYSICAL PROPERTIES

Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.1 g/cm <sup>3</sup> at 21.5 °C
Melt index	260°C, 2.16kg	6.6-6.7 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

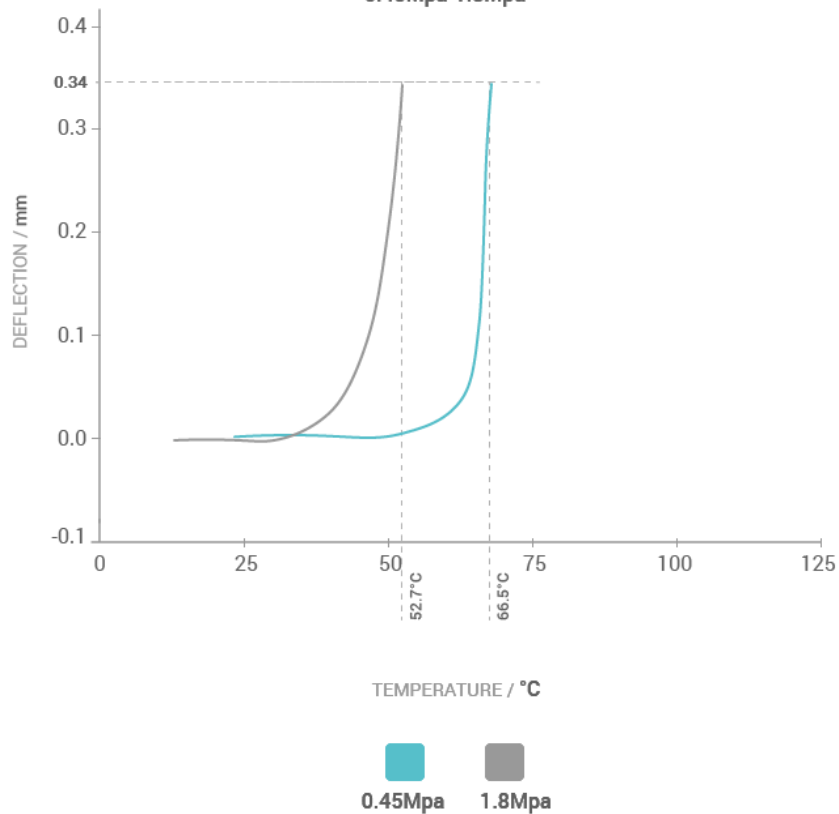


## THERMAL PROPERTIES

Property	Testing Method	Typical Value
Glass transition temperature	DSC, 10°C/min	70 °C
Melting temperature	DSC, 10°C/min	N/A
Crystallization temperature	DSC, 10°C/min	N/A
Decomposition temperature	TGA, 20°C/min	260 °C
Vicat softening temperature	ISO 306, GB/T 1633	67 °C
Heat deflection temperature	ISO 75 1.8MPa	52.7 °C
Heat deflection temperature	ISO 75 0.45MPa	66.5 °C
Thermal conductivity	N/A	N/A
Heat shrinkage rate	N/A	N/A

### HDT CURVE

**PolyCast™**  
0.45Mpa-1.8Mpa



## MECHANICAL PROPERTIES

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	1745 ± 151 MPa
Young's modulus (Z)		N/A
Tensile strength (X-Y)	ISO 527, GB/T 1040	35.7 ± 1.7 MPa
Tensile strength (Z)		N/A
Elongation at break (X-Y)	ISO 527, GB/T 1040	5.8 ± 0.9 %
Elongation at break (Z)		N/A
Bending modulus (X-Y)	ISO 178, GB/T 9341	1198 ± 173 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	60.2 ± 1.6 MPa
Bending strength (Z)		N/A
Charpy impact strength (X-Y)	ISO 179, GB/T 1043	9.6 ± 0.9 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

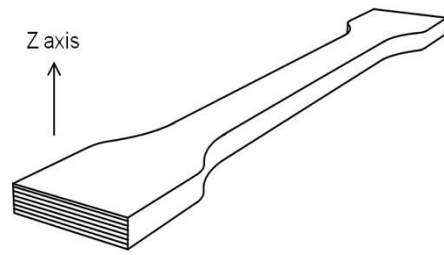
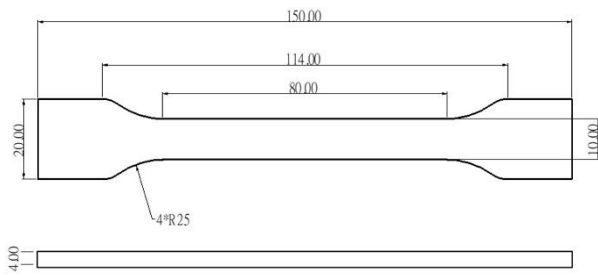
Parameter	
Nozzle temperature	190 – 220 (°C)
Build surface material	BuildTak®, Glass, Blue Tape
Build surface treatment	Glue
Build plate temperature	25 - 70 (°C)
Cooling fan	ON
Printing speed	40-60 (mm/s)
Raft separation distance	0.1-0.14 (mm)
Retraction distance	1 (mm)
Retraction speed	20 (mm/s)
Environmental temperature	Room temperature
Threshold overhang angle	60 (°)
Recommended support material	PolyDissolve™ S1

### Note:

- It is highly recommended to use the PolyBox™ when printing with PolyCast™ and to store it in the resealable bag.

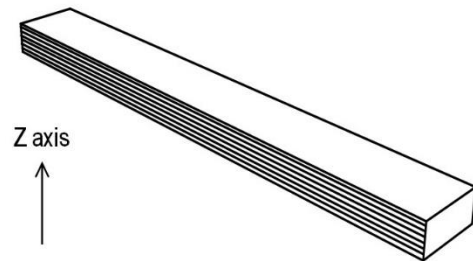
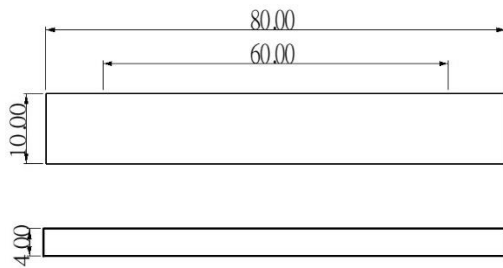
## TENSILE TESTING SPECIMEN

ISO 527, GB/T 1040



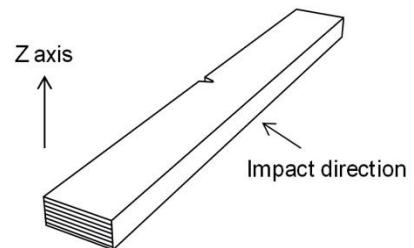
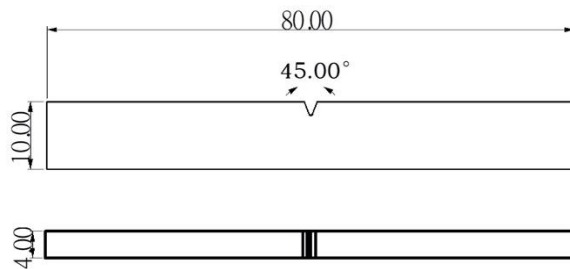
## FLEXURAL TESTING SPECIMEN

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	220 °C
Bed temperature	60 °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.

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