

Technical Data Sheet

PolyCast™

www.polymaker.com

V5.4



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 ³ 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

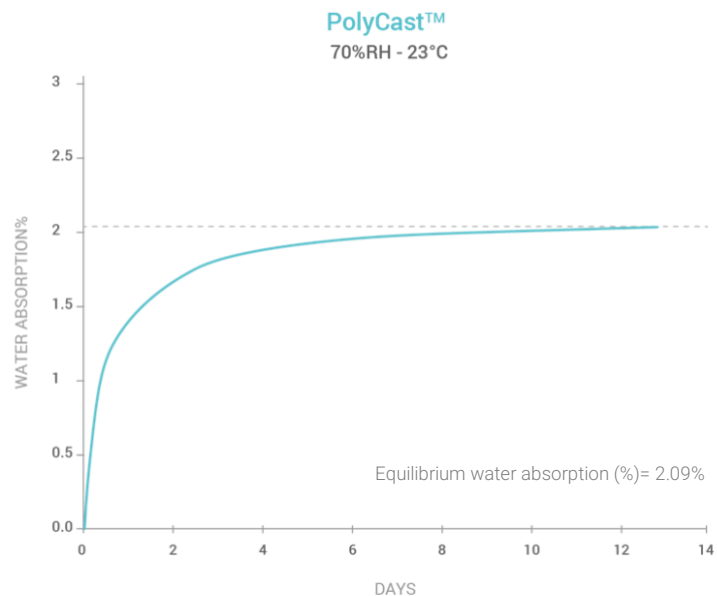
CHEMICAL RESISTANCE DATA

Property	Typical Value
Effect of weak acids	Not Available
Effect of strong acids	Not Available
Effect of weak alkalis	Not Available
Effect of strong alkalis	Not Available
Effect of oils and grease	Not Available

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 CURVE



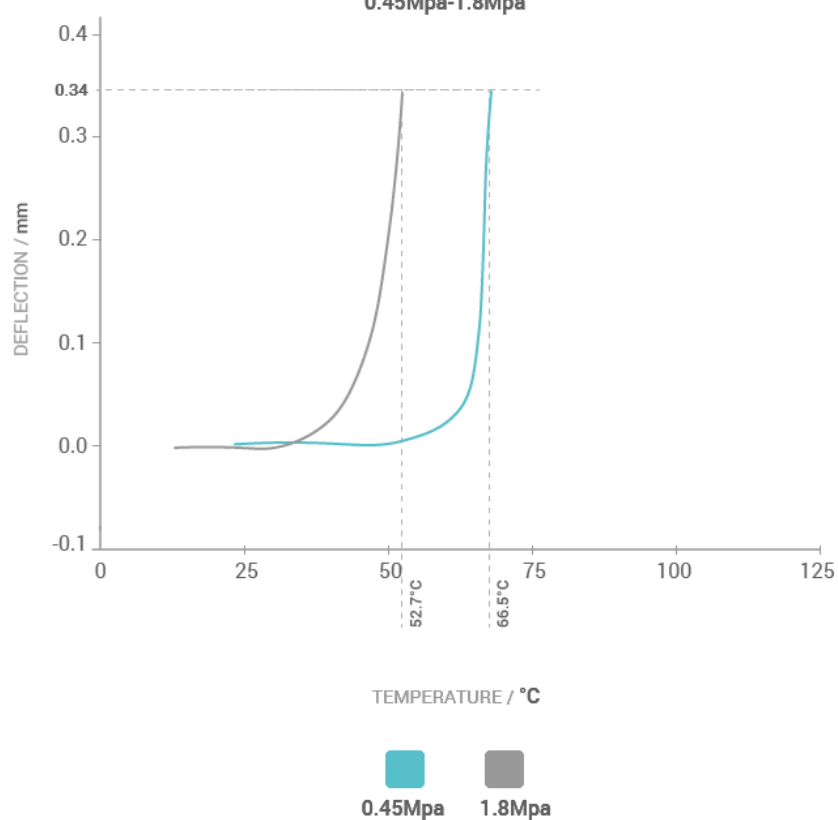
THERMAL PROPERTIES

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	53 °C
Heat deflection temperature	ISO 75 0.45MPa	67 °C

HDT CURVE

PolyCast™

0.45Mpa-1.8Mpa



MECHANICAL PROPERTIES

Property	Testing Method	Typical Value
Young's modulus (X-Y)	ISO 527, GB/T 1040	2215 ± 42 MPa
Young's modulus (Z)		2111 ± 87 MPa
Tensile strength (X-Y)	ISO 527, GB/T 1040	53.2 ± 1.1 MPa
Tensile strength (Z)		26.3 ± 2.1 MPa
Elongation at break (X-Y)	ISO 527, GB/T 1040	5.7 ± 0.5 %
Elongation at break (Z)		1.3 ± 0.1 %
Bending modulus (X-Y)	ISO 178, GB/T 9341	2233 ± 106 MPa
Bending modulus (Z)		N/A
Bending strength (X-Y)	ISO 178, GB/T 9341	78.0 ± 2.3 MPa
Bending strength (Z)		N/A
Notched Charpy impact strength (X-Y)	ISO 179, GB/T 1043	2.9 ± 0.3 kJ/m ²
Notched Charpy impact strength (Z)		N/A

RECOMMENDED PRINTING CONDITIONS

Parameter	
Nozzle temperature	190 – 220 (°C)
Build surface treatment	PC and Texture PEI (Glue when needed)
Build plate temperature	25 - 70 (°C)
Cooling fan	ON
Printing speed	50 - 200 (mm/s)
Retraction distance	1 - 3 (mm)
Retraction speed	20 - 40 (mm/s)
Closure Chamber	No Needed
Recommended support material	PolyDissolve™ S1
Drying setting	50°C for 12h
Annealing setting	-

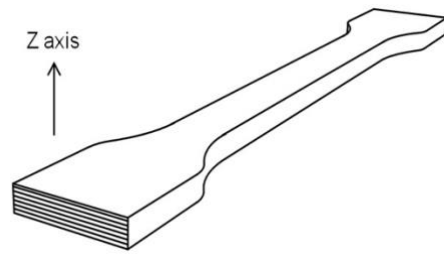
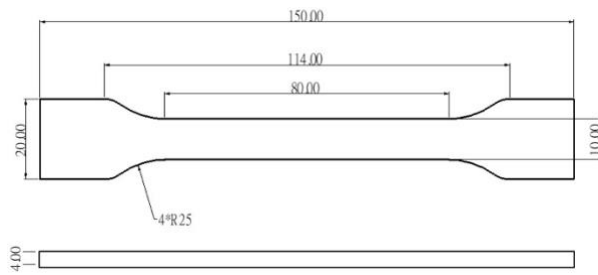
* Based on 0.4 mm nozzle. Printing conditions may vary with different nozzle diameters

Note:

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

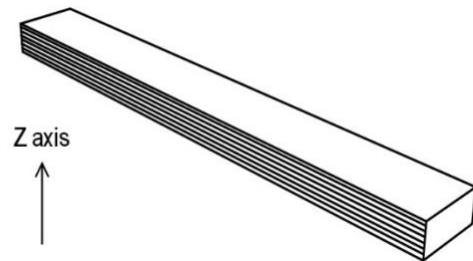
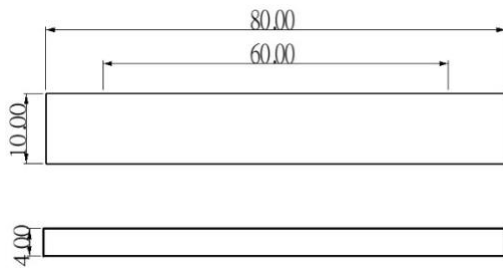
TENSILE TESTING SPECIMEN

ISO 527, GB/T 1040



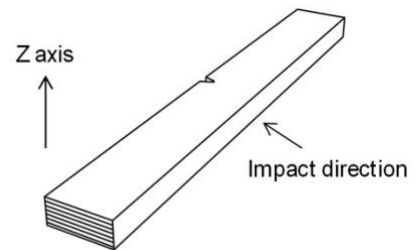
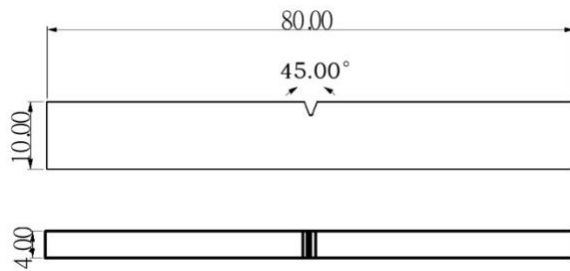
FLEXURAL TESTING SPECIMEN

ISO 178, GB/T 9341



IMPACT TESTING SPECIMEN

ISO 179, GB/T 1043



HOW TO MAKE SPECIMENS

Printing temperature	220 °C
Bed temperature	60 °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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