

## Technical Data Sheet

# Polymaker™ PC-PBT

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

V5.4



## Polymaker™ PC-PBT

Polymaker™ PC-PBT is a PC/PBT polymer blend which offers good heat resistance and toughness at low temperature (-20°C/-30°C). Polymaker™ PC-PBT also features good chemical resistance.

### PHYSICAL PROPERTIES

| Property           | Testing Method    | Typical Value                 |
|--------------------|-------------------|-------------------------------|
| Density            | ISO1183, GB/T1033 | 1.2 g/cm <sup>3</sup> at 23°C |
| Melt index         | 260°C, 5 kg       | 16-22 g/10min                 |
| Light transmission | N/A               | N/A                           |
| Flame retardancy   | N/A               | N/A                           |

### CHEMICAL RESISTANCE DATA

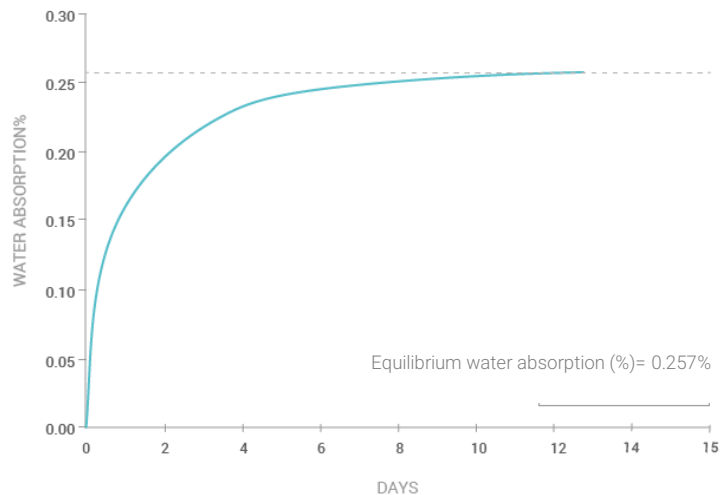
| Property                  | Typical Value |
|---------------------------|---------------|
| Effect of weak acids      | Good          |
| Effect of strong acids    | Poor          |
| Effect of weak alkalis    | Fair          |
| Effect of strong alkalis  | Poor          |
| Effect of oils and grease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

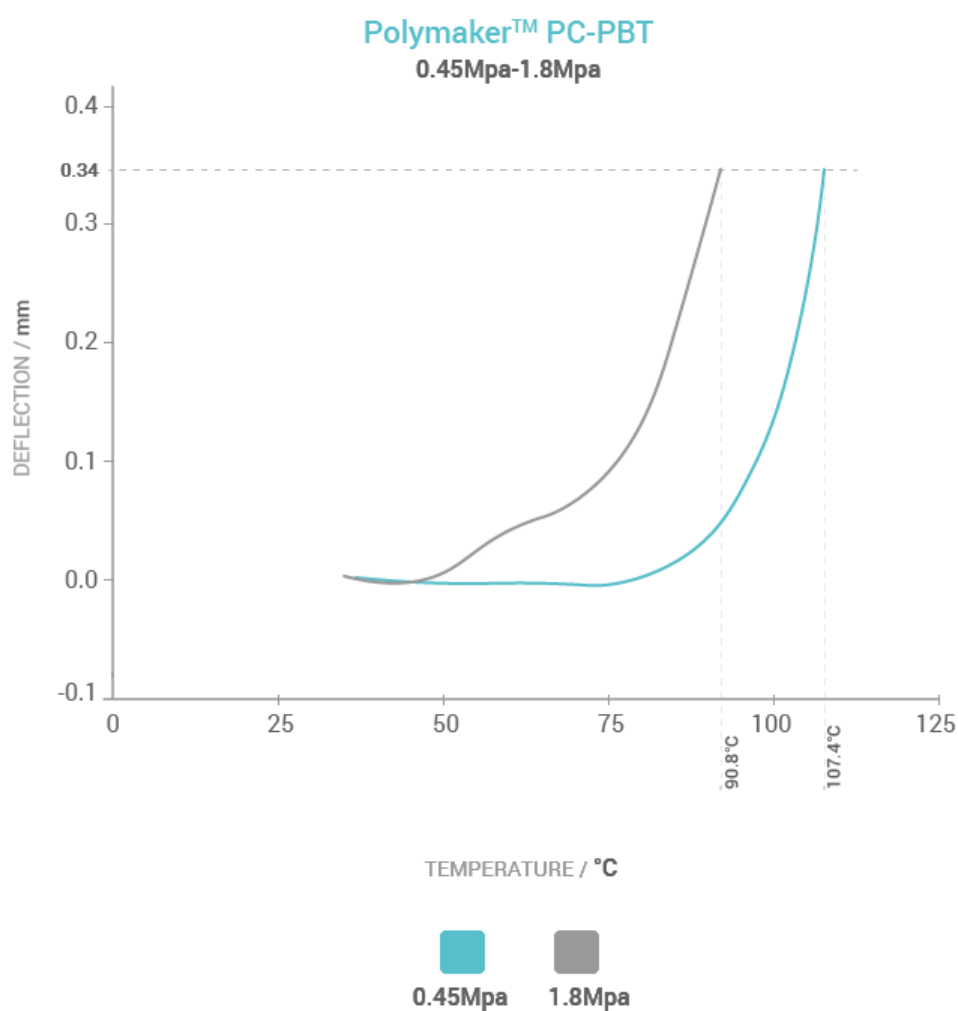
Polymaker PC-PBT  
70%RH - 23°C



## THERMAL PROPERTIES

| Property                     | Testing Method     | Typical Value |
|------------------------------|--------------------|---------------|
| Glass transition temperature | DSC, 10°C/min      | 140 °C        |
| Melting temperature          | DSC, 10°C/min      | 223 °C        |
| Crystallization temperature  | DSC, 10°C/min      | 186 °C        |
| Decomposition temperature    | TGA, 20°C/min      | N/A           |
| Vicat softening temperature  | ISO 306, GB/T 1633 | 139 °C        |
| Heat deflection temperature  | ISO 75 1.8MPa      | 91 °C         |
| Heat deflection temperature  | ISO 75 0.45MPa     | 107 °C        |

## HDT CURVE



## MECHANICAL PROPERTIES

| Property                              | Testing Method            | Typical Value                |
|---------------------------------------|---------------------------|------------------------------|
| Young's modulus (X-Y)                 | ISO 527, GB/T 1040        | 1940.2 ± 76.5 MPa            |
| Young's modulus (Z)                   |                           | 1743.4 ± 66.2 MPa            |
| Tensile strength (X-Y)                | ISO 527, GB/T 1040        | 50.4 ± 0.6 MPa               |
| Tensile strength (Z)                  |                           | 37.9 ± 0.3 MPa               |
| Elongation at break (X-Y)             | ISO 527, GB/T 1040        | 4.6 ± 0.7 %                  |
| Elongation at break (Z)               |                           | 3.8 ± 0.5 %                  |
| Bending modulus (X-Y)                 | ISO 178, GB/T 9341        | 1950.3 ± 142.6 MPa           |
| Bending modulus (Z)                   |                           | N/A                          |
| Bending strength (X-Y)                | ISO 178, GB/T 9341        | 77.3 ± 0.3 MPa               |
| Bending strength (Z)                  |                           | N/A                          |
| Notched Charpy impact strength (X-Y)  | ISO 179, GB/T 1043        | 33.0 ± 0.3 kJ/m <sup>2</sup> |
| Notched Charpy impact strength (Z)    |                           | N/A                          |
| Low temperature impact strength (X-Y) | ISO 179-1/1eA:2010, -30°C | 15.7 ± 2.9 kJ/m <sup>2</sup> |
| Low temperature impact strength (Z)   | ISO 179-1/1eA:2010, -30°C | N/A                          |

## RECOMMENDED PRINTING CONDITIONS

| Parameter                    |                                |
|------------------------------|--------------------------------|
| Nozzle temperature           | 260 – 280 (°C)                 |
| Build surface treatment      | Texture PEI (Glue when needed) |
| Build plate temperature      | 100 – 115 (°C)                 |
| Cooling fan                  | OFF                            |
| Printing speed               | 50 - 250 (mm/s)                |
| Retraction distance          | 1 - 3 (mm)                     |
| Retraction speed             | 20 - 40 (mm/s)                 |
| Closure Chamber              | Needed (100-110°C)             |
| Recommended support material | -                              |
| Drying setting               | 75°C for 6h                    |
| Annealing setting            | 90°C for 2h                    |

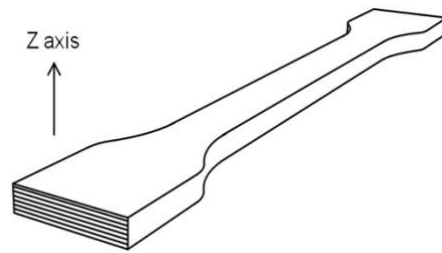
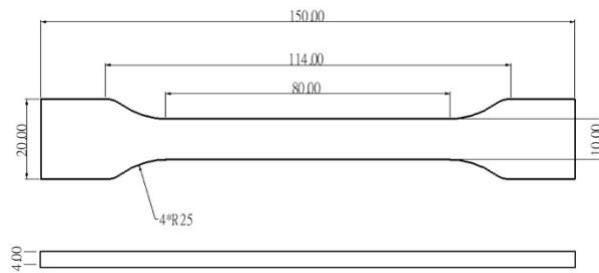
\* Based on 0.4 mm nozzle. Printing conditions may vary with different nozzle diameters

### Note:

- When printing with Polymaker™ PC-PBT it is recommended to use an enclosure. For large part it is recommended to use a heated chamber.
- It is recommended to anneal the printed part right after the printing process to release the residual internal stress. Annealing settings: 90°C for 2h

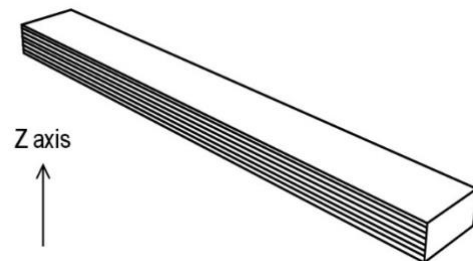
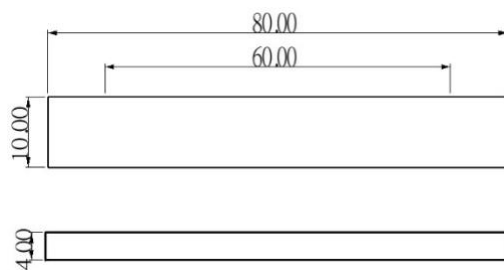
## TENSILE TESTING SPECIMEN

ISO 527, GB/T 1040



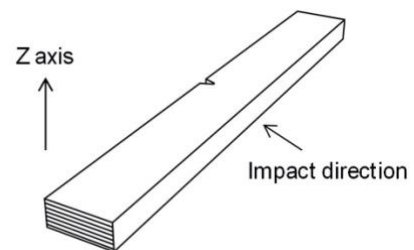
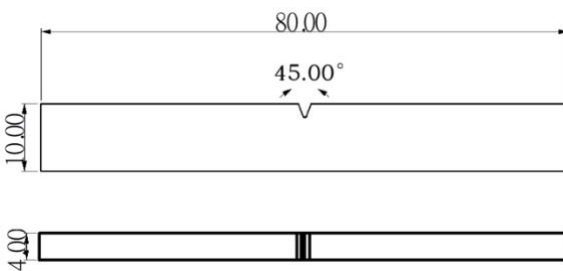
## FLEXURAL TESTING SPECIMEN

ISO 178, GB/T 9341



## IMPACT TESTING SPECIMEN

ISO 179, GB/T 1043



## HOW TO MAKE SPECIMENS

|                           |        |
|---------------------------|--------|
| Printing temperature      | 260 °C |
| Bed temperature           | 100 °C |
| Shell                     | 2      |
| Top & bottom layer        | 3      |
| Infill                    | 100%   |
| Environmental temperature | 90°C   |
| Cooling fan               | OFF    |

**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.