Polymaker™ PC-ABS

Industrial

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Printing with Polymaker™ PC-ABS

Polymaker™ PC-ABS

Polymaker™ PC-ABS is a PC/ABS polymer blend which offers excellent toughness and heat resistance while displaying good surface finish and compatibility with metal plating.

Printing settings

Nozzle Temperature:	250-270 °C
Bed Temperature:	90-105 °C
Chamber Temperature:	90-100 °C
Printing Speed:	30-50 mm/s
Cooling Fan:	OFF

Note: Settings are based on 0.4 mm nozzle, and may vary with different printers and nozzle diameters.

Bed surface

Polymaker™ PC-ABS can be printed on almost any surface with a thin coat of Magigoo PC. We recommend a flex plate to facilitate the removal of the model from the plate.

High temperature conditions

We recommend a full metal hot end that can maintain a stable temperature of at least 260˚C. We also recommend to use a heated chamber capable of reaching at least 80˚C.

Annealing Polymaker™ PC-ABS parts

We recommend annealing all models printed in Polymaker™ PC-ABS. This allows users to take full advantage of the mechanical and thermal properties.

The annealing process consists of putting the model in an oven at 90 ˚C for 2 hours.

Support material

PolyDissolve™ S2 is the recommended support material for Polymaker™ PC-ABS.

For more information, please visit
www.polymaker.com

PCP: Profile Creation Process

The profile creation process (PCP) allows users to rapidly develop a printing profile for any given material/printer. During this process is important to consider all of these factors to build a successful profile.

Geometry
Material
Printer
Environment
Purpose

Polymaker developed the PCP to assist customers in creating their own tailored print profiles; taking into account the material, printer, environment as well as the models geometry and purpose. Additionally, the PCP allows individuals to develop their own knowledge and troubleshooting skills.

The PCP is available on www.polymaker.com

The PCP is divided in 5 steps:

It uses less than 300g of materials and less than 7h of working time.

Step 1: Extrusion Flow
Step 2: Flow Management
Step 3: Cooling Fan
Step 4: Warpage
Step 5: Fine Details

Each of these steps has a specific objective and introduces an important concept about the FFF 3D printing process. Each step will also give you the possibility to push your test further for more accurate results.

Polymaker PC materials

	Specialty	Specialty	PolyMax™	PolyMax™	PolyLite™
	PC-ABS	PC-PBT	PC-FR	PC	PC
Young's modulus (MPa)	1832	1986	2634	2048	2307
Tensile strength (MPa)	39.9	41.8	67	59.7	62.7
Elongation at break (%)	4.2	4.6	3.9	12.2	3.2
Bending modulus (MPa)	2081	1933	2518	2044	2477
Bending strength (MPa)	66.3	64.4	96.6	94.1	100.4
Charpy impact strength (kJ/m^2)	25.8	21.4	11.7*	25.1	3.4

*The flame retardant significantly reduces the toughness of the raw PC material but the composition still provides a good balance between mechanical properties and flame retardant performance.

Note: Tested with 3D printed specimens.

Polymaker™ PC-ABS

Polymaker™ PC-ABS is a material with good surface adhesion which makes it easier to post process:

Metallizing

Polymaker™ PC-ABS can be metallized by deposition of a metallic layer in a high vacuum or by electroplating. In the metal deposition process, the best adhesion is achieved with aluminum, tin and copper. As protection for the very thin layer of metal, a coating of paint on the molding is recommended. In the case of electroplating, Polymaker™ PC-ABS offers the best adhesion for the electroless plating for its first layer.

Painting

Polymaker™ PC-ABS is well-suited for painting. To ensure a good paint finish, the surfaces must be clean (free of dust or grease). Particularly good adhesion can be achieved using polyurethane-based paint. It is recommended to contact the paint manufacturer prior to painting as some combinations of solvents are unsuitable for the PC-ABS blend and can cause defects or stress cracking.

Welding

Polymaker™ PC-ABS parts can be joined together by ultrasonic, vibration, friction, hot plate or laser welding. In order to achieve the best possible component quality when using ultrasonic welding, it is important to ensure a correctly formed weld seam

Bonding

Polymaker™ PC-ABS parts can be bonded not only to one another, but also to other materials. This is possible using suitable adhesive glues or diffusion adhesives. It is recommended to contact the paint manufacturer prior to painting as some combinations of solvents are unsuitable for the PC-ABS blend and can cause defects or stress cracking. Dry-cleaning fluid or similar cleaning agents, which do not damage the material, can be used to remove grease. Roughening and subsequently cleaning the surfaces can also improve glue adhesion. In the case of adhesive glues, can also improve two-component adhesives based on epoxy and, silicone resins and polyurethanes.

Material Development

If your application requires a specific material that is not yet available in the market, consider our custom development service. With our talented material scientists and application engineers, we are ready to develop the necessary materials to enable your unique application.



Material development

-Twin-screw compounding
-Single-screw extrusion
-Torque rheometry
-Wet chemistry
-Other polymer processing equipment

Testing and characterization

-Thermal characterization (DSC, softening point)
-Mechanical testing (tensile, 3-point bending)
-Optical microscopy
-Capillary rheometry
-FTIR-ATR

3D Printing

-3D printing
-Post-processing
-Application development

Our state-of-the art R&D facilities allow us to engineer materials at different levels and fully optimize them for 3D printing. Our goal is to deliver materials with the right combination of properties/functions, processability and form to suit your needs!

Application

Processability technologies

Printing thechnologies
Post-processing
Other

Properties & functions

Mechanical
Thermal
Electrical
Other

Form

Pellet
Filament
Powder
Other

Polymaker products

PolyLite™

PLA
PETG
ABS
PC
ASA

PolyMax™

PLA
PETG
PC
⚙ PC-FR

PolyFlex™

TPU90
TPU95

PolyMide™

CoPA
⚙ PA6-CF
⚙ PA6-GF

PolyDissolve™

S1
S2

Specialty

PolyWood™
PolySmooth™
PolySupport™
PolyCast™
⚙ Polymaker™ PC-PBT
⚙ Polymaker™ PC-ABS

Hardware

PolyBox™
Polysher™

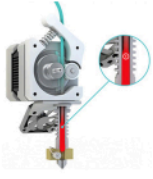
More products coming soon...

Industrial range: ⚙

Technologies

JAM-FREE™

Regular PLA



With Jam-Free™

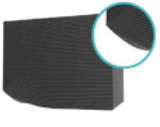
ASH-FREE™

Without Ash-Free™
Ash content: 0.5%

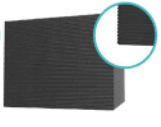
With Ash-Free™
Ash content: 0.003%

WARP-FREE™

Regular Nylon



With Warp-Free™



STABILIZED FOAMING™

Wood

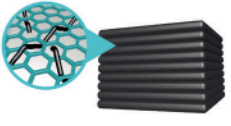
Stabilized Foaming™

LAYER-FREE™

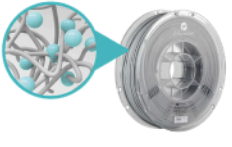
Rough surface

With Layer-Free™

FIBER ADHESION™



NANO-REINFORCEMENT



About Polymaker

Our Values

Customer Oriented

Responsible

Entrepreneurial

Embracing Innovation

Mission

Polymaker is committed to lowering the barriers to innovation and manufacturing, by continuously developing advanced 3D printing material technologies for industries and consumers.

Contact us

For any inquiries please contact:

inquiry@polymaker.com

For technical support please contact:

support@polymaker.com

The information provided in this document is intended to serve as basic guidelines on how particular product can be used. Users can adjust the printing conditions based on their needs and actual situations. It is normal for the product to be used outside of the recommended ranges of conditions. 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 particular use or application. Polymaker shall not be made liable for any damage, injury or loss induced from the use of Polymaker materials in any particular application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