PolyCast™

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My first print

1) Prepare the gcode

Download the MyFirstPrint.stl on **www.polymaker.com**
Load the stl file in your favorite slicer.

Enter the correct settings for PolyCast™;

Property	Value
Nozzle temperature	190˚C - 220˚C
Bed temperature	25˚C - 70˚C
Nozzle speed	40mm/s – 60mm/s
Cooling fan	ON
Layer height	0.1
Infill	20%
Number of outlines (shell)	3
Top/Bottom layers	4

2) Prepare the printer

- Clean the build plate and prepare it with the right surface:
We recommend to print **PolyCast™** on glass with glue, painters tape or PEI sheet with glue.
- Level the build plate.
- It is recommended to clean the nozzle when you change the material to prevent partial clog.

Note: It is recommended to place the printer in a well ventilated area.

3) Prepare the filament

- Carefully open the resealable bag, remove the spool and close the bag back to preserve the desiccant bag.
- It is highly recommended to store **PolyCast™** in the **PolyBox™** to prevent moisture absorption which will lower the quality and the mechanical properties of the print.
- Load the filament in your printer and wait until you have a consistent extrusion.
- At the end of the print, make sure to correctly store the filament back in the resealable bag if you are not using the **PolyBox™**.

4) Start the print

When the print begins, make sure the first layer is correctly laid down and sticking well to the bed before leaving the printer to finish the print. If you hear popping sounds and notice that the surface quality of your print is uneven or the color is not consistent, the filament has absorbed too much moisture. You can dry **PolyCast™** at 60˚C for 12 hours and start the print again.

5) Post process

PolyCast™ can be polished with alcohol (IPA) to obtain a smooth surface. We recommend the **Polysher™** for the polishing process.
PolyCast™ can also be wet sanded to obtain a smoother surface.
PolyCast™ can be dipped in hot water (above 80˚C) and be reshaped. The model will then harden back in its new shape.

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.

Available colors:

Drying settings	Diameter accuracy (2.85/1.75 mm):			Weight accuracy:		
60˚C for 12h	70%	is within	+/- 0.01	600g	+/-	20g
	97%	is within	+/- 0.02	750g	+/-	20g
	99%	is within	+/- 0.03	1000g	+/-	30g

In most cases PolyCast™ patterns can be used in a similar way as traditional wax patterns. However, in order to achieve high success rates and consistent results, we still recommend that you start with the following "best practice" guide.

1. Build casting tree

The casting tree can be built using the same method as wax patterns. **PolyCast™** patterns adhere well to the wax. Additional vents/gates may be added to promote air flow during the burnout process. Another effective way to promote air flow is to drill through the outer shell of the pattern at the gate location.

2. Make ceramic shell

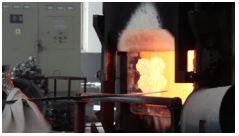
Build up the ceramic shell around the casting tree by using the standard process of the foundry. Use silica sol/gel, colloidal silica, etc. as slurry systems for **PolyCast™** (avoid using sodium silicate). The number of coatings can be between 4-9 and varies by foundries and by parts. We recommend 5-6 coats for **PolyCast™**. If the patterns contain some fine structures, we recommend 7-9 coats.

3. De-waxing

Use high temperature steam to remove the wax tree. The **PolyCast™** will still remain in the ceramic shell. You can choose to skip the de-waxing step entirely if recycling the wax is not a priority; in this case the wax will simply be burned off in the kiln together with **Polycast™**.

4. Sinter ceramic shell and burnout

Heat the kiln to 1100-1200 °C for an extended period of time (up to 40-60 min) to simultaneously sinter the ceramic shell and burn out the **PolyCast™** patterns. The optimum burnout temperature and time may be determined by each foundry for the metal/part to be produced and the specific kiln or furnace used.



5. Rinse shell

After cooling down to ambient temperature, rinse the ceramic shell with water to remove any residual ash that may still be present. We recommend the rinse step just as a "safe" option for foundries to get started. Once the foundry is more experienced with the process they can skip the shell rinsing step upon their choice. In our experience foundries can get excellent results without this step.

6. Cast

Once the ceramic shell is fully prepared and clean, complete the casting process by following the standard practice for the designated metal/alloy. Steps may include pre-heating the shell, pouring the molten metal/alloy to the shell, allowing the shell to cool, removing the shell, cutting off gates, machining, heat treatment, etc.

Product Families

PolyLite™

ABS, PETG, PLA, PC

PolyLite™ is a family of 3D printing filaments made with the best raw materials to deliver exceptional quality and reliability. PolyLite™ covers the most popular 3D printing materials to meet your everyday needs in design and prototyping.

PolyMax™

PLA, PC, PETG

The PolyMax™ is a family of advanced 3D printing filaments produced with Polymaker's Nano-reinforcement technology, to deliver exceptional mechanical properties and printing quality.

PolyFlex™

TPU95

PolyFlex™ is a family of high-quality flexible materials. It provides the perfect solution for applications where high flexibility and durability are required.

PolyMide™

CoPA

PolyMide™ is a family of Nylon/polyamide based filaments. Produced with Polymaker's Warp-Free™ technology, PolyMide™ filaments deliver engineering properties intrinsic to Nylon and ease of printing.

PolyDissolve™

S1

PolyDissolve™ is a family of dissolvable support filaments. This family offers support solution for our portfolio of filaments. It enables a greater design freedom.

Specialty

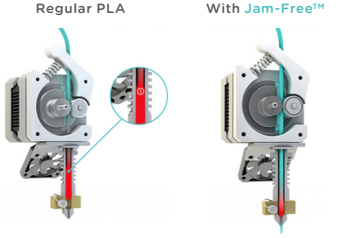
PolyWood™, PolySupport™, PolySmooth™, PolyCast™

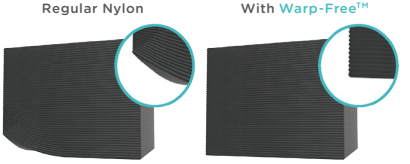
The Specialty family provides unique filaments from Polymaker to unlock new 3D printing applications.

Technologies

JAM-FREE™

Jam-Free™ technology improves the heat stability of Polymaker's PLA filaments with softening temperatures over 140 °C. As a result, Polymaker's PLA filaments show minimal softening in the "cold end" and can melt rapidly once entering the heating zone, leading to excellent printing quality with zero risk of nozzle jams.





WARP-FREE™

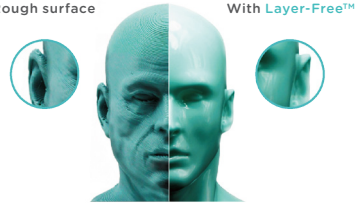
Warp-Free™ technology enables the production of Nylon-based filaments that can be 3D printed with excellent dimensional stability and near-zero warpage. This is achieved by the fine control of micro-structure and crystallization behavior of Nylon, which enables the material to fully release the internal stress before solidification.

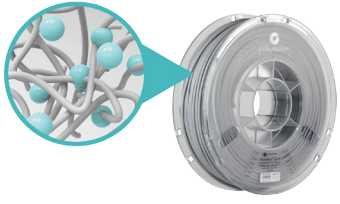
ASH-FREE™

Ash-Free™ technology allows Polymaker's filament which has been designed for investment casting to burn off cleanly without any residue, enabling defect-free metal parts. 3D printing has been used to produce investment casting patterns as it cuts down both the cost and lead time for small-volume production runs.

LAYER-FREE™

Layer-Free™ technology involves exposing a 3D printed part to an aerosol of micro-sized alcohol droplets, generated by a rapidly vibrating, perforated membrane called the nebulizer. The aerosol will then be adsorbed by the surface of the 3D printed part and render it smooth and layer-free.



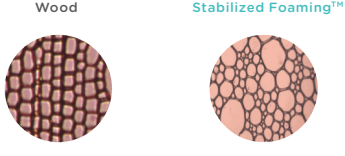


NANO-REINFORCEMENT

Nano-reinforcement technology is applied to produce filaments with excellent mechanical properties and printing quality. It dramatically improves the toughness of the material by increasing its impact resistance.

STABILIZED FOAMING™

Stabilized Foaming™ technology is used to produce foamed filaments, whose foam structure can survive the printing process and be inherited by the printed parts. This enables light weight 3D printed parts with unprecedented surface finish.



Hardware

Polymaker offers 3D printing accessories to optimize the user experience with their filaments.

PolyBox™

PolyBox™ is a dry storage box designed to provide the optimum environment for 3D printing filaments. The PolyBox™ is compatible with all 3D printers and can house two 1kg spools or one 3kg spool.

Polysher™

The Polysher™ is a desktop post processing unit designed to remove layer lines from PolySmooth™ and PolyCast™ prints. The Polysher™ uses Polymaker's Layer-Free™ technology to create a fine mist of alcohol which evenly smooths the model.

About Polymaker

Who We Are?

Polymaker is an international team passionate about 3D printing. We produce the very best 3D printing materials by controlling every stage of production. With a diverse portfolio of materials ranging from high performance plastics to unique aesthetic solutions, Polymaker will continue to add cutting edge materials to its ever-growing portfolio.

Mission & Vision

Our mission is to create the best in class when it comes to 3D printing materials. We believe that materials are the enabling factor which will realise 3D printing as a final production tool. Our high performance materials offer solutions that will develop 3D printing into a mainstream manufacturing method.

Locations

Polymaker is a global company head-quartered in Shanghai. With distribution centers located in North America, Europe & Asia, our materials have penetrated every corner of the globe. Our worldwide presence is closely managed through our relationships with our local distributors and resellers. Polymaker is a regular exhibitor at 3D printing exhibitions on 4 continents.

Research & Development

At the core of Polymaker is our research & development laboratory, this is where all our materials are formulated and fine-tuned from the ground up to create the best in class 3D printing materials. Our precision testing equipment combines the latest advancements in technology to ensure we are ahead of the game.

Quality Control

Polymaker implements a rigorous quality control check on all materials. Utilizing our state of the art technology, we measure both the roundness and diameter of our filaments many thousand times a second, monitoring our processes with strict tolerances. We also have a number of processes and technologies that set apart Polymaker materials.

Contact us

For any inquiries or 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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