

PolyCore™

By  polymaker



Copyright
© 2024-2025 Polymaker
All Rights Reserved

EN version 1.3

CONTENT

01	About Polymaker	01
	About PolyCore™	01
02	Architecture	02
	Outdoor Architecture	03
	Case Study	03
	Indoor Decoration	05
	Case Study	05
03	Mold and Tooling	06
	Low Temperature Molds	07
	Case Study	08
	Medium Temperature Molds	09
	Case Study	09
04	Contact Us	10
05	Our Partners	10

About Polymaker

Polymaker is a developer and manufacturer of 3D printing materials committed to innovation, quality and sustainability. Its award-winning product portfolio has enabled numerous of individuals and companies to “better create and innovate”. Headquartered in Changshu, China, Polymaker has multiple office locations in Shanghai, Utrecht and Houston ready to serve customers across the globe.

About PolyCore™

PolyCore™ is a family of pellet-based 3D printing materials for Fused Granular Fabrication (FGF). Built on Polymaker's 10+ years of experience and expertise in material-extrusion based 3D printing, PolyCore™ features excellent printability and is widely compatible with most pellet-extrusion 3D printers. It is worth emphasizing that all PolyCore™ series products have been developed based on specific applications, particularly in the fields of architecture and mold applications.

Architecture



Outdoor Architecture



Indoor Decoration

Mold and Tooling



Low Temperature Molds
(Ambient - 80°C)



Medium Temperature Molds
(80°C - 120°C)

Architecture

3D printing, particularly FGF-based large scale 3D printing elevates traditional architecture to an entirely new level in terms of design freedom, efficiency and sustainability. Materials play a vital role in the success of 3D printed architectural structures, as they directly influence the performance and application range of architectural products. PolyCore™ offers a number of materials designed for different application scenarios (e.g. indoor vs outdoor).

In general these materials feature:

- Excellent weather resistance

- Good dimensional stability (low residual stress), particularly for large prints

- Cost effectiveness



Outdoor Architecture

PolyCore™ ASA-3012

20% glass fiber reinforced ASA compound

PolyCore™ ASA-3012 combines excellent printability, good mechanical properties and outstanding weather resistance. Parts printed with PolyCore™ ASA-3012 can maintain > 90% of their mechanical properties after extended periods of irradiation exposure (following ISO 4893.2). It is widely used to produce outdoor structures that can withstand harsh environments.

PolyCore™ PETG-1013

30% glass fiber reinforced PETG compound

PolyCore™ PETG-1013 is a 30% glass fiber reinforced PETG compound featuring excellent dimensional stability, good weather resistance and cost-efficiency. Its excellent dimensional stability makes it the top choice for large parts (generally over 3 meters in size) and projects requiring assembly from multiple printed parts.

Case Study

“Liuyun Bridge” in Chengdu, China



“Liuyun” in Chinese means “flowing clouds”. This pedestrian bridge, inspired by the free-flowing shape of the clouds, is the largest 3D printed bridge in the world to date. It is a masterpiece of engineering and art, only made possible with 3D printing.

The main body of the bridge was printed almost entirely with PolyCore™ ASA-3012. The material was chosen due to its excellent weather resistance and mechanical strength, as well as the ability to form large, dimensionally accurate parts.

Previously, Polymaker has made significant contributions to other notable 3D printed bridges, including the Shanghai Taopu Central Park Bridge and the Quanzhou Bridge, both of which fosters innovation in the field.



Co-Producer: Shanghai Construction Group Co., Ltd., Shanghai Kuying Technology Co., Ltd.,

Material usage: Around 30 tons

Date: Apr, 2022

Case Study

FlowBend Bench

The FlowBend bench features flowing lines and an ergonomic design that makes it not only eye-catching but also incredibly comfortable and durable. Its organic shapes, which are challenging to produce with traditional manufacturing methods, are made possible through advanced FGF/LFAM technology. Combining the flexibility of 3D printing with high-quality stainless steel, this modular bench seamlessly fits into any space, making it an ideal addition for both commercial and residential environments.

The choice of PolyCore™ PETG-1013 for the FlowBend bench is driven by its exceptional dimensional stability and good weather resistance. These advantages make it particularly suitable for large parts and projects that require assembly from multiple printed components, ensuring the bench's durability and longevity in any setting.



Co-Producer: Adaxis, CEAD, and Studiobenkert
Materials usage: Approximately 400 kg
Date: Nov, 2024

Indoor Decoration

PolyCore™ PETG-1000

PETG compound with good optical clarity

PolyCore™ PETG-1000 is an optically clear grade of PETG suitable for indoor applications such as luminaires, furniture and decorative pieces. It can be easily colored to match different aesthetic needs.

Case Study

Unique-Shaped Table - Ontigo T10

The Ontigo T10 table is a stunning example of innovative design that highlights the capabilities of FGF/LFAM. With its complex and artistic shape, this table serves not only a functional purpose but also acts as a captivating indoor decorative piece.

This impressive creation is made from PolyCore™ PETG-1000, an optically clear material designed for indoor applications like furniture and decorative items. The use of this translucent material allows light to play through the layers, creating mesmerizing effects that enhance its overall aesthetic appeal. Its compatibility with 3D printing technologies enables intricate designs that traditional methods struggle to replicate, inspiring creativity in modern furniture design.



Co-Producer: Adaxis, CEAD, and Studiobenkert
Materials usage: Approximately 16 kg
Date: Nov, 2024

Mold and Tooling

Producing large mold and tooling has quickly become the most popular application of FGF, as it offers significant advantages (particularly in reducing production lead time and costs) compared to traditional mold-making (e.g. CNC milling) techniques.

Generally speaking, 3D printed mold and tooling is categorized based on service temperatures, ranging from ambient up to 200+°C. Polymaker is quickly expanding its PolyCore™ family to cover an increasing range of composite tooling applications, and it currently addresses the needs for low-temperature and medium-temperature toolings.



Low Temperature Molds

(Ambient - 80°C)

PolyCore™ ABS-5012

20% glass fiber reinforced ABS compound

PolyCore™ ABS-5012 is a cost-effective choice for 3D printed mold tooling that are used in low temperature range (ambient up to 80°C).

PolyCore™ ABS-5022

20% carbon fiber reinforced ABS compound

PolyCore™ ABS-5022 is a great choice of 3D printed mold tooling for low temperatures (ambient up to 80°C). The carbon fiber reinforcement offers increased stiffness, strength and resistance to deformation under pressure.

PolyCore™ PETG-1113

30% glass fiber reinforced PETG compound

PolyCore™ PETG-1113 is a 30% glass fiber reinforced PETG compound featured with outstanding printability, good adhesion to gelcoat, excellent mechanical properties and good cost effectiveness. It is suitable for low temperature mold tooling such as vacuum forming molds and concrete templates.



Case Study

Construction of the "Zai Shui Yi Fang" in Shanghai Fish Lake

In the construction of the "Zai Shui Yi Fang" in Shanghai Jinhai Lake, 3D printed concrete molds were successfully applied to the innovative practice of bloom columns. They were printed with PolyCore™ ABS-5012, a material with outstanding mechanical properties and excellent dimensional stability, able to withstand the heat released by concrete curing without deformation, making it a high-quality choice for printing and producing concrete forms with complex curved surfaces.



Co-Producer: Shanghai Construction Group Co., Ltd.,
Materials usage: Approximately 10 tons
Date: Jun, 2023

Medium Temperature Molds

(80°C - 120°C)

PolyCore™ PC-7413

30% glass fiber reinforced PC compound

PolyCore™ PC-7413 is specially engineered for medium-temperature composite tooling applications, supporting autoclave curing at temperature up to 120°C. It has undergone comprehensive validation, demonstrating exceptional performance at every stage of the process.

This material features:

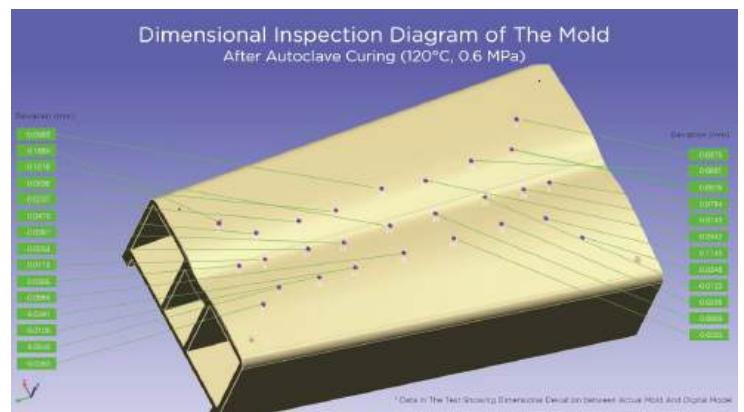
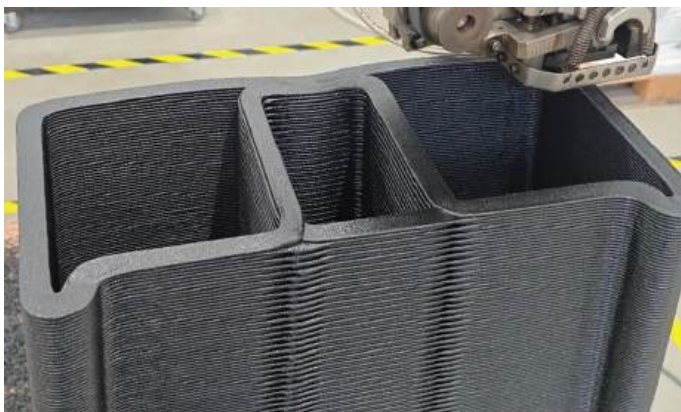
- Excellent heat resistance: With a heat deflection temperature (HDT) of 136°C at 1.82 MPa, PolyCore™ PC-7413 is ideal for autoclave curing processes up to 120°C.
- Exceptional printability: The glass fiber reinforcement minimizes warping during printing, and its finely tuned rheological behavior ensures smooth extrusion and excellent layer adhesion.
- Cost effectiveness: PolyCore™ PC-7413 offers a cost-effective alternative to traditional carbon fiber reinforced materials, making it perfect for companies scaling up production without compromising on performance.

Case Study

Medium Temperature Molds for Areospace

In composite manufacturing, medium-temperature composite molds play a crucial role. Poly-Core™ PC-7413 is specifically engineered for this application. This advanced material was used to print an aerospace mold, followed by precision CNC machining and autoclave curing at 120°C and 0.6 MPa, ensuring dimensional tolerances within 30.2 mm and achieving airtightness.

Collaborating with Helio Additive further optimized the process, resulting in a "First Time Right Print" and additional 38% reduction in printing time. This case highlights the successful application of PolyCore™ PC-7413 in medium-temperature composite mold manufacturing.



Co-Producer: Helio Additive
Materials usage: Approximately 80 kg
Date: August 2024



Newsletter



Case Study

Contact us

polycore.inquiry@polymaker.com



Website



LinkedIn

Our Partners



