



PolyCore™

By  polymaker

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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. More importantly, PolyCore™ offers products that are designed to satisfy the needs of specific applications, particularly architectural and tooling applications.

Architecture



Outdoor Architecture



Indoor Decoration

Molds & Tools



Low Temperature Molds
(ambient - 80°C)



Medium Temperature Molds
(80°C - 140°C)

Architecture

Introduction

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. 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 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 good weather resistance, excellent dimensional stability and cost-efficiency. It is suitable for architectural applications with lower temperature requirements.

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 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.

Material usage: Around 30 tons

Date: Apr, 2022



Taopu Central Park Bridge in Shanghai, China



Youtube Video



Read more

The Taopu bridge was the world's first 3D printed bridge using polymer composite materials, built by Shanghai Construction Group (SCG) back in 2018.

Printed with PolyCore™ ASA-3012 and pre-assembled in SCG's factory, the installation of the bridge took half a day with zero construction waste. PolyCore™ ASA-3012 was chosen as its favorable properties of weather and chemical resistance, thermal stability, and toughness. The Taopu bridge clearly demonstrated the great potential and what's possible with 3D printing.

Materials usage: Around 30 tons

Date: Dec, 2018



Namthaja's Rakah Roundabout Sculptures



Youtube Video



Read more

The Rakah Roundabout project is based in Saudi Arabia and initiated by Namthaja in 2022. It is one of the largest 3D printed landscapes worldwide. Inspired by palm trees from the local environment and constructed from 2m vertical panels, the Rakah roundabout sculptures are a unique and ambitious project that demonstrates sustainability and recyclability.

PolyCore™ ASA-3012 was an excellent choice for the application because of the polymers intrinsic UV / weather resistant properties. Additionally, PolyCore™ ASA-3012 offers great printability and dimensional stability and which was crucial for the long printing jobs.

Materials usage: Around 15 tons

Date: Oct, 2022



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

Large Size Vase

One fancy and large size vase was printed by PolyCore™ PETG-1000 by Jiangsu Shanzao 3D Technology Company. PolyCore™ PETG-1000 features high freedom of design, excellent optical properties and good dimensional stability.

As such, 3D printed vases using transparent PETG materials not only meet consumer demand for personalized and innovative designs, but also provide customers with more creative and cost-effective product solutions due to its excellent optical properties and process adaptability.

Materials usage: Around 6.5kg

Date: Oct, 2023



Molds & Tools

Introduction

Producing large molds and tools has quickly become the most popular application of FGF, as it offers significant advantages compared to traditional mold-making (e.g. CNC milling) techniques.

Generally speaking, 3D printed molds and tools are categorized based on their service temperatures, ranging from ambient up to 200+ °C. Polymaker is quickly expanding its PolyCore™ family to cover an increasing range of molding and tooling applications.



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 molds and tools 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 molds and tools for low temperatures (ambient up to 80°C). The carbon fiber reinforcement offers increased stiffness, strength and resistance to deformation under pressure.

Case Study

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

In the construction of the "Zai Shui Yi Fang" in Shanghai Fish Lake, 3D 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.

Materials usage: Around 10 tons

Date: Jun, 2023



Medium Temperature Molds (80°C - 140°C)

PolyCore™ PC-GF

Glass fiber reinforced PC compound

PolyCore™ PC-GF is designed for composite tooling applications, and suitable for curing and autoclaving temperatures up to 130°C.



Contact Us

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