

# **3D-Printed Concrete Market Forecasts to 2032 – Global Analysis By Offering (Materials, Hardware, Software and Services), Technology (Extrusion-Based Printing and Powder-Based Printing), Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global 3D-Printed Concrete Market is accounted for \$697.7 million in 2025 and is expected to reach \$9313.3 million by 2032 growing at a CAGR of 44.8% during the forecast period. 3D-printed concrete is a modern building technique that uses additive manufacturing to make detailed and custom concrete parts straight from digital designs. It reduces material waste, labor costs, and project timelines while enabling innovative designs not achievable through traditional methods. Widely applied in housing, infrastructure, and sustainable building, 3D-printed concrete plays a pivotal role in enhancing efficiency, affordability, and environmental performance within the construction industry's evolving technological landscape.

According to data from the European Commission's Horizon 2020 research program, it funded the "C3PO" project, which aimed to develop a fully automated on-site construction 3D printing system.

Market Dynamics:

Driver:

Improved safety and waste reduction

The 3D-printed concrete market is significantly driven by enhanced safety protocols and substantial waste minimization capabilities. Traditional construction methods generate

approximately 30-40% material waste, whereas additive manufacturing techniques reduce waste to less than 5%. Additionally, 3D printing eliminates the need for workers to operate in hazardous environments, reducing construction site accidents by up to 60%. Automated construction processes minimize human exposure to concrete dust and chemical additives, improving occupational health standards. The precision-based layer deposition ensures optimal material utilization while maintaining structural integrity requirements.

#### Restraint:

##### Material limitations and consistency

Current concrete formulations often lack the required rheological properties for smooth extrusion and proper layer adhesion. Maintaining consistent material flow rates and curing times across different environmental conditions remains problematic. Moreover, limited availability of specialized concrete mixes compatible with various 3D printing systems restricts project scalability. The lack of standardized material specifications and quality control protocols further complicates construction projects, leading to structural integrity concerns and increased rejection rates in commercial applications.

#### Opportunity:

##### Development of new material formulations

Research institutions and construction companies are actively developing high-performance concrete mixes incorporating nanomaterials, fiber reinforcements, and recycled aggregates. Bio-based additives and self-healing concrete formulations are emerging as game-changing innovations. Moreover, partnerships between material suppliers and 3D printing equipment manufacturers are accelerating the commercialization of specialized concrete blends. These innovations promise improved printability, enhanced durability, and reduced environmental impact, potentially expanding applications across residential, commercial, and infrastructure sectors.

#### Threat:

##### Resistance from traditional construction industry

Traditional contractors and labor unions express concerns about job displacement and skill obsolescence due to automation. Regulatory bodies often lack comprehensive

standards for 3D-printed structures, creating approval delays and liability concerns. Moreover, conservative procurement practices in public infrastructure projects favor proven conventional methods over innovative technologies. The substantial capital investment required for 3D printing equipment and training further discourages adoption among smaller construction firms, limiting market expansion potential.

#### Covid-19 Impact:

The COVID-19 pandemic initially disrupted the 3D-printed concrete market through construction project delays and supply chain interruptions. However, the crisis accelerated interest in automated construction technologies to maintain social distancing protocols. Additionally, reduced labor availability highlighted the benefits of unmanned construction processes. Moreover, government infrastructure stimulus packages created opportunities for innovative construction methods. The pandemic emphasized the need for resilient construction techniques, potentially accelerating long-term adoption of 3D printing technologies in the construction sector.

The materials segment is expected to be the largest during the forecast period

The materials segment is expected to account for the largest market share during the forecast period. This dominance stems from the continuous demand for specialized concrete formulations, additives, and reinforcement materials required for 3D printing applications. The recurring nature of material consumption compared to one-time equipment purchases ensures sustained revenue generation. Moreover, ongoing research and development investments in advanced material formulations drive segment growth. The materials segment benefits from established supply chains and lower entry barriers compared to equipment manufacturing, attracting diverse suppliers and fostering competitive pricing strategies.

The extrusion-based printing segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the extrusion-based printing segment is predicted to witness the highest growth rate. This technology offers superior scalability for large-scale construction projects and compatibility with various concrete formulations. Additionally, extrusion-based systems demonstrate proven reliability in creating complex architectural geometries and structural elements. Moreover, decreasing equipment costs and improved printing speeds enhance commercial viability. The segment benefits from continuous technological advancements in nozzle design, material flow control,

and automated layering systems, making it the preferred choice for infrastructure and residential construction applications.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, attributed to substantial investments in construction automation technologies and supportive government initiatives promoting innovative building methods. Additionally, the presence of leading 3D printing equipment manufacturers and research institutions accelerates technology development and commercialization. Moreover, stringent safety regulations and labor cost considerations drive adoption of automated construction solutions. The region benefits from advanced infrastructure development projects and an early adopter mentality among construction companies, establishing a strong foundation for market leadership.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR. Rapid urbanization and a persistent demand for affordable, efficient housing are the primary catalysts. Countries like China and India are at the forefront, with robust government backing and large-scale infrastructure projects driving adoption. The technology's ability to reduce construction time and waste, combined with advancements in robotic automation, makes it an ideal solution for addressing the region's immense construction needs. Furthermore, a growing focus on sustainable and "smart city" initiatives aligns perfectly with the eco-friendly and innovative nature of 3D printing, which is fueling the region's expansion.

Key players in the market

Some of the key players in 3D-Printed Concrete Market include COBOD International, ICON Technology Inc., Apis Cor, CyBe Construction, XtreeE, Winsun, Contour Crafting Corporation, SQ4D Inc., PERI Group, Holcim Group, Heidelberg Materials, Sika AG, Lafarge, Vertico, WASP, Mighty Buildings, RIC Technology, BetAbram, and Constructions-3D.

Key Developments:

In February 2025, Texas-based construction 3D printing company ICON has secured \$56 million in Series C funding, following a layoff announcement last month. Co-led by

Norwest Venture Partners and Tiger Global Management, this funding round marked the first close with an additional \$75 million in funding expected. Existing investors, including CAZ Investments, LENX, Modern Ventures, Oakhouse Partners, and Overmatch Ventures, also participated.

In December 2024, Harcourt Technologies Ltd (HTL.tech) has constructed the Europe's and the world's first social housing project compliant with the ISO/ASTM 52939:2023 standard for additive manufacturing, which Ireland has adopted. Using COBOD's BOD2 3D Construction Printer, the project demonstrates how 3D construction printing is addressing housing needs efficiently while meeting codes and the ISO/ASTM standard.

In April 2023, XtreeE has announced the deployment of three new 3D printing units operated by partners in Switzerland, the United States and Japan. This brings XtreeE's AC sites to 12 across three continents, with the startup planning six more by the end of the year. Previously, XtreeE received funding of €1.1 million in 2017 and €1 million in 2018, with investments from Vinci Construction, Shibumi International (a fully-owned venture fund of Gu?lermak Heavy Industries and engineering firm Thornton Tomasetti) and Holcim France.

#### Offerings Covered:

Materials

Hardware

Software

Services

#### Technologies Covered:

Extrusion-Based Printing

Powder-Based Printing

#### Applications Covered:

Walls & Panels

Flooring, Roofing & Paving Structures

Columns & Beams

Stairs & Architectural Elements

Entire Housing Units & Modular Buildings

Other Applications

#### End Users Covered:

Residential Buildings

Commercial Buildings

Infrastructure

Architectural Projects

Industrial Facilities

Emergency & Disaster Relief Shelters

Other End Users

#### Regions Covered:

North America

US

Canada

Mexico

## Europe

Germany

UK

Italy

France

Spain

Rest of Europe

## Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

## South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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