The global market for 3D printing in the construction industry had a value of $8.0 million in 2022 and is anticipated to grow at a whopping compound annual growth rate (CAGR) of 177.7% to reach nearly $4.6 billion by 2028.

The use of 3D printing for construction started in the 1990s, when multiple organizations started testing 3D printers to create modular elements for full-scale projects. By the 2000s, the frequency of these applications soared, and in 2014, the world witnessed the first ever 3D-printed commercial building. Now, significant technological advancements, including in automation and in data and material preparation, are allowing more construction companies to adopt 3D printing.

3D printing offers construction companies the ability to develop complex shapes while using less material than conventional manufacturing processes. It also aids in less material wastage, as concrete waste and failed prints can be reused as raw material in later stages for printing. Plus, workers skilled in handling 3D printers can perform jobs more easily and reduce the chances of injuries.

While the overall market for 3D printing for construction is still developing, there are several materials that have been successfully used.

**Concrete.** Traditional concrete is not used in 3D printing for construction as it may clog the printer’s nozzle and would not adhere to the successive layers. Instead, the concrete comprises super-plasticizers, fibers, and other ingredients that enable it to settle in an optimal time for layer adhesion. These ingredients also aid in imparting strength to the concrete to reduce the requirement for steel reinforcements.

**Polymers.** Some common polymers used in 3D printing for construction include polylactic acid, acrylonitrile butadiene styrene, and polyamide. 3D printing construction with recycled plastic, such as polypropylene and Bio-PA, is an area of increasing interest and development as the construction industry seeks more sustainable and eco-friendly solutions.

**Local soils.** 3D printing for construction makes it possible to use various soils, including clay and sand, as the base material. Using local soils is considered to be environmentally friendly and is time- and cost-effective.

Extrusion and binder jetting are among the most common processes used in 3D printing for construction both commercially and globally. These methods are used in both on-site and off-site construction.

3D printing for construction is frequently viewed as a solution to the housing crisis in the United States and elsewhere. According to an estimate by the United Nations Human Settlements Program, by the end of 2030, nearly 30 billion people, which is 40% of the global population, will require access to adequate housing. This estimate also means nearly 96,000 new affordable and accessible houses must be built every day to meet the demand.

Currently, project partnership is the preferred strategy by key market players to establish a strong presence in the rapidly growing 3D printing for construction market. Some examples of these partnerships can be seen in Table 1.

### About the author

BCC Publishing Staff provides comprehensive analyses of global market sizing, forecasting, and industry intelligence, covering markets where advances in science and technology are improving the quality, standard, and sustainability of businesses, economies, and lives. Contact the staff at Helia.Jalili@bccresearch.com.

### Resource