

3D-PRINTABLE ULTRA HIGH-PERFORMANCE CONCRETE (CONCRETE - 3D)

The technology enables the fabrication of intricate concrete structures with exceptional strength and durability using additive manufacturing techniques

Concrete 3D printing (C3DP) is one of the emerging and alternate construction technologies. The desired structure or elements are printed sequentially using a computer-controlled positioning. It offers freedom of design, waste minimization, reduced construction time, and production costs. Concrete - 3D technology is an advanced cementitious composite having high compressive strength and tensile and flexure strength. It offers formwork-free construction with good buildability, scalability, and printability. Concrete-3D is produced using locally available materials such as fly ash, slag, cement, and silica fume. It is incorporated with micro steel fibers to impart high toughness and post-peak ductility. The mix can be printed using an extrusion-based printer and is suitable for onsite and offsite building construction.

Features / Highlights

Technical Details

Applications

- Formwork-free construction
- 3D printed formwork
- Production of letters, benches, street furniture, planters, and landscaping elements
- Construction of prefabricated modular housing units

Status of Technology

- Development of UHPC mixes for 3D printing
- Rheological Characterization of Fibered and Plain 3D Printable UHPC
- Hardened state Characterization of Fibered and Plain 3D Printable UHPC



Future Plan

- Size effect studies 3D-Printable UHPC
- Fatigue and Fracture characterization of 3D-Printable UHPC



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