NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

GEOPOLYMER CONCRETE PRINTING

TechnologyOverview

About two decades after its first proof-of-concept, 3D concrete printing is on the threshold to become more matured. It provides new opportunities such as higher degree of architectural freedom, lower costs due to a lack of scaffold, less labour intensive manpower and less material required. To achieve these, the print processes need to be more robust. Therefore, there is increasing demand to develop new generation of thixotropic material that can retain its shape after extrusion.

The 3D printable geopolymer cement is a novel technology developed by SC3DP. The technology uses industry by-products such as fly ash, slag, silica fume etc. The motivation behind using different by-products rather than ordinary Portland cement is to provide sustainable, faster and more economical urban infrastructure. It is proven that this technology is able to meet the strength requirements for various non-structural applications, reduces material wastages and construction time.

Potential Applications

This solution is suitable for :

- Pre-cast industries for printing of mould/form work instead of carving complex shapes out of wood or metal plates
- For low cost housing components (Non-structural)
- For building planners and architects, where freeform design can be achieved easily directly from 3D computer model
- Modular construction

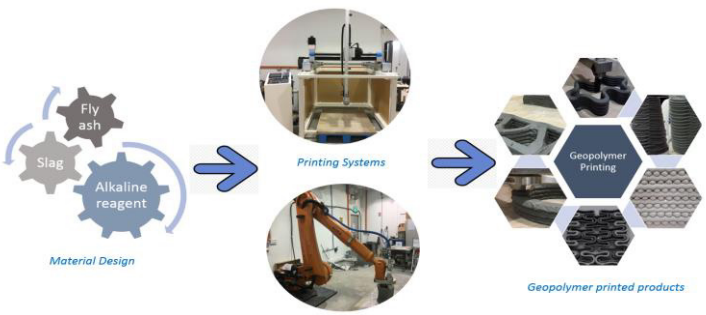
Customer Benefits

- Low cost housing using locally available by-products together with 3D printing technology
- Architects can print their freeform designs by taking the benefits of concrete printing
- A faster, safer and sustainable manufacturing process

Features & Specifications

The system comprises of:

- Material development – using industry by-products and transform them to a suitable binder using advanced geopolymerization technology
- Mixing and placing – continuous mixing system that delivers wet mix instantly
- Dispensing unit – using both gantry or robotic system to 3D print the structure



If you are interested in this technology, please contact the BD Manager: edmund.lim@ntu.edu.sg

Singapore Centre for 3D Printing