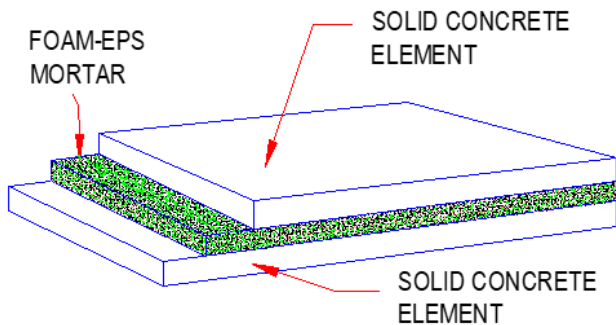


PRECAST CONCRETE INSULATED COMPOSITE WALL PANEL



INVENTION

A new load bearing composite wall panel of width ranging between 1.5 to 2 meters and thickness of 200 mm. It has foam Expanded Polystyrene (EPS) mortar insulation sandwiched between two concrete elements.



MARKET SIZE AND GROWTH

Precast concrete wall panels are gaining popularity due to economics, speed of erecting and design flexibility it offers. With growing need for energy efficient green buildings, the panels have insulation sandwiched between concrete or metal outer panels.

Extruded Polystyrene (XPS) is typically used for insulation. However XPS is brittle, has inefficient bonding with outer layers and offers ineffective insulation due to utilities passing through.

The global building panel market is expected to reach \$234.1 billion by 2025 with a CAGR of 4.5% from 2020¹.

ADVANTAGES

- Insulation foam-EPS mortar has very good bond with two outer concrete elements
- Insulation material can easily be mixed and poured on site reducing cost
- Light weight as per ACI 318 building code with unit volume weight of 1807 kg/m³
- Depending on structural requirements the thickness of wall can be designed
- Fast track construction
- Cost of installation can be reduced

¹ Building Panel Market Report: Trends, Forecast and Competitive Analysis, August 2020

APPLICATION

Load bearing outer walls for construction industry for new houses and infrastructure

PROJECT STATUS

- Thermal conductivity of individual foam-EPS mortar and solid concrete panels were tested as per ASTM C 177 standard and equivalent thermal conductivity of composite wall panel was calculated as 0.323 W/m.K or R value of 0.6
- Compressive strength of 40 MPa was achieved for 28 day cured concrete cured specimens tested as per ASTM C 150 standard
- A 3-D frame model of a typical housing unit was subjected to different loading conditions showing maximum compressive and tensile stress of 3.286MPa and 1.53 MPa respectively

LOOKING FOR DEVELOPMENT PARTNER

Looking for a precast wall panel manufacturer who can provide feedback and collaborate on making a scaled version of the invented composite panel. The ultimate objective is to license the intellectual property (IP) to such partner for commercialization.

PATENT PROTECTION

A US patent [US10544587](https://patents.google.com/patent/US10544587) covers the invention

ABOUT KFUPM

KFUPM was established in year 1963 and is located in Dhahran city of Saudi Arabia. KFUPM currently ranks at 163 in QS World University Rankings 2022. KFUPM's Innovation & Technology Transfer office strives for taking innovation from lab to marketplace.

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