

Eco-friendly building material for improved energy efficiency and thermal comfort

Introduction

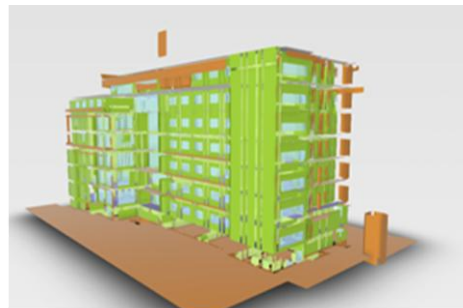
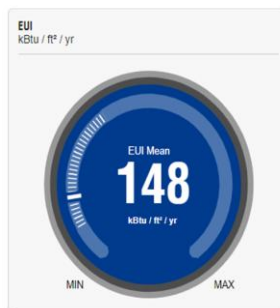
Pakistan's building sector consumes over 50% of total energy, with household and commercial sectors growing annually at 4.7% and 2.5% respectively. Phase Change Materials (PCMs) offer a solution by regulating indoor temperatures, reducing reliance on mechanical heating and cooling. Integration of Building Information Modeling (BIM) technology has enhanced PCM application for improved energy efficiency and thermal comfort in buildings.

Methodology

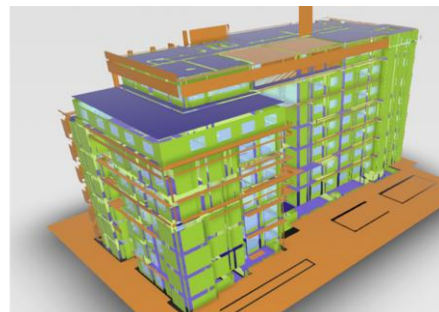
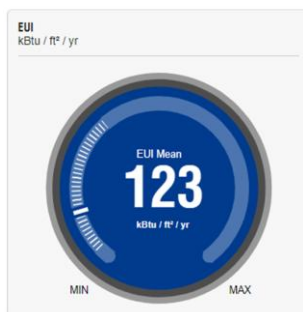
Literature review | Material Selection | PCM Procurement and Testing | Normal Concrete Structure Modeling of structure on Revit | PCM Improved Concrete Modeling on Revit | Improved HVAC modeling on Revit | Compilation and Analysis of Results

Applications

Precast PCM integrated Concrete Elements | Building Walls, Facade and Floors of PCM integrated Concrete | Smart Industrial Buildings | R&D on Material Innovation | Consultancy using BIM Technology (e.g., Revit)



Energy demand of Nutech Academic Block with normal concrete



Energy demand of Nutech Academic Block with PCM integrated concrete