PHYSICAL ENERGY STORAGE CEMENT

Can phase change material enhanced concrete improve thermal energy storage? Phase change material (PCM)-enhanced concrete offers a promising solutionby enhancing thermal energy storage (TES) and reducing energy demands for heating and cooling in buildings. However,challenges related to PCM leakage,mechanical strength reduction,and encapsulation durability hinder widespread adoption.

Can phase change energy storage materials be used in building energy conservation? To explore the application of phase change energy storage materials in building energy conservation, in this study, an innovative composite thermal energy storage cement mortar (CTESCM) was developed using lauric acid???palmitic acid/expanded graphite (LA-PA/EG) as the composite phase change material (CPCM).

Does enthalpy improve thermal performance of phase change heat storage concrete blocks? The findings indicate that increasing the thermal conductivity and enthalpy will substantially improvethe thermal performance of phase change heat storage concrete blocks. A CFD model was used for the thermal simulation of concrete wallboards infused with PCMs (Essid et al.,2022).

Can PCM-enhanced concrete improve thermal storage? Research has demonstrated that PCM-enhanced concrete can improve thermal storage by up to 50%compared to traditional concrete (Arslan &Ilbas,2024; Rashid et al.,2023,2024).

How is thermal performance measured in PCM-Concrete Composites? To quantify thermal performance,the thermal storage capabilityof the PCM-concrete composite is calculated,providing a measure of the material???s ability to absorb,store,and release thermal energy. where FLH is freezing latent heat and MLH is melting latent heat.

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How does a PCM store thermal energy? PCMs are materials capable of storing and releasing thermal energy during their phase transformationsat specific temperatures (Urgessa et al.,2019). The phase transitions of PCM,typically between solid and liquid states,drive their thermal energy storage (TES) processes (Rathore et al.,2022).

Physical energy storage is a technology that uses physical methods to achieve energy storage with high research value. This paper focuses on three types of physical energy storage systems: pumped

In particular, concrete emerges as a good material for this type of TES applications [6, 7].Khare et al. [8] found that high temperature concretes, such as the high alumina cement-based ???

The transition to sustainable energy highlights the importance of thermal energy storage (TES) systems, particularly in concentrated solar power plants. While Portland cement ???

? 1/4 ? Solar thermal energy efficiency of cementitious mortar is enhanced by introducing a phase change material (PCM) with thermal energy harvesting/releasing ability. Within this framework, ???