

The continual expansion of the global agricultural greenhouse area presents challenges for conventional structures, resulting in insufficient insulation, a rapid nocturnal temperature decline, and the potential risk of crop freezing. ... Development of a novel composite phase change material-based paints and mortar for energy storage ...

Stearic acid (SA) is being used as phase change material (PCM) in energy storage applications. In the present study, the microencapsulation of SA with SiO<sub>2</sub> shell was carried out by sol-gel method.

In addition, the law of full-field deformation evolution of CA-PA/EVM-based thermal energy storage mortar under uniaxial compression failure was studied based on digital image correlation (DIC ...

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 ...

Experimental exploration of incorporating form-stable hydrate salt phase change materials into cement mortar for thermal energy storage. Author links open overlay panel Yushi Liu a b c, Mingjun Xie a, Xiaojian Gao a b c, Yingzi Yang a b c, Yuan Sang a. Show more. Add to Mendeley. ... the application areas of form-stable hydrated salt PCMs are ...

The thermal insulation performance and energy storage of concrete, mortar, concrete block and brick were poorer, so that energy consumption of building with other materials was higher [33]. Table 8 . Energy consumption of ...

"A review on energy conservation in building applications with thermal storage by latent heat using phase change materials" by Khudhair et al. (2004) [22] from the journal Energy Conversion and Management, is the most cited paper in query 1 (Table 3), with 915 citations overshadows the rest of publications. This review paper is focused on ...

There are various types of PCMs that can be applied for thermal energy storage (TES) applications. The most important types of PCMs are: Organic PCMs - made from hydrocarbons [13], these can store and release energy [14] during the melting and solidification phase transition (paraffins, fatty acids, and their derivatives); Inorganic PCMs are made from ...

Preparation, microstructure, performance and mortar application of paraffin/titanium-bearing blast furnace slag phase change aggregate. ... prepare paraffin/Ti-BFS phase change aggregate (PTA) by vacuum impregnation, and then PTA was used to develop thermal energy storage cement mortar by replacing sand. ...

ASJC Scopus subject areas. Materials ...

Direct incorporation of phase change materials (PCMs) in the mortar matrix increases the effective thermal mass of a structure without increasing the size or significantly changing its weight; thereby reduces the energy consumption and brings comfort/well-being throughout the various seasons. Hence, the effect of direct incorporation of various types of ...

Also, it was observed that 10% MPCM added to mortar decreased its thermal conductivity by 22%, increasing the material's thermal insulation. In addition, 10% MPCM incorporated mortar having 1 m<sup>2</sup> surface area and 10 mm thick can store 246 kJ heat energy, which will further improve thermal comfort in building.

1. Introduction. Energy shortage has become a universal problem in the world with the rapid economic growth and the large consumption of fossil energy [1], [2] is the mean way of resolving the problem to search and develop cleaning, effective and reproducible energy [3], [4], [5], [6]. To tackle the challenges of energy shortages and environmental issues, both ...

In contrast,  $k_{65}$  (representing the thermal conductivity of PCM in the liquid state) decreased with PCM aggregate content due to the impact of latent heat during the phase-changing process. The measured  $k_{25}$  and  $k_{65}$  fell within the range of 0.829-0.842 and 0.447-0.465 W / m · °C respectively.. The latent heat of concrete containing hybrid PCM ...

Solar passive house equipped with thermal energy storage cement mortar (TESCM) containing encapsulated phase change material (PCM) has showed great potential in terms of energy saving.

Solar energy is an energy intermittent source that faces a substantial challenge for its power dispatchability. Hence, concentrating solar power (CSP) plants and solar process heat (SPH) applications employ thermal energy storage (TES) technologies as a link between power generation and optimal load distribution. Ordinary Portland cement (OPC)-based ...

The development and application of energy storage mortar embody a critical advancement in sustainable construction. By fusing traditional brick and mortar applications with sophisticated thermal management technologies, this material aims to mitigate energy inefficiencies in buildings. 1. INTRODUCTION TO ENERGY STORAGE MORTAR

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