The research significance of phase change energy storage materials in architecture

Are phase change materials useful for thermal energy storage?
As evident from the literature, development of phase change materials is one of the most active research fields for thermal energy storage with higher efficiency. This review focuses on the application of various phase change materials based on their thermophysical properties.

Can phase change materials be used in the building sector?
The energy storage density increases and hence the volume is reduced,in the case of latent heat storage (Fig. 1 b) [18o]. The incorporation of phase change materials (PCM) in the building sector has been widely investigated by several researchers17,18o.

What factors affect the thermal performance of phase change materials?
The thermal performance of the phase change materials depends on the melting temperature,thermal conductivity and energy storage density. Among the different types of PCM suitable for thermal energy storage,the most suitable material is one with a fast melting and solidification point .

Can solar energy be used to store thermal energy and phase change materials?
The storage of thermal energy and phase change materials has been a relevant research topic in recent years,attracting the interest of several researchers around the world,in the most diverse areas,due to its ability to reduce energy needs,based in the solar energy.

Can phase change materials reduce energy costs?
The numerical results also indicated that energy costs can be reducedby using multiple phase change materials compared to the use of a single PCM. The impregnation of porous matrices of high thermal conductivity with phase change materials,allows increasing the conduction of heat.

How much research has been done on phase change materials?
A thorough literature survey on the phase change materials for TES using Web of Science led to more than 4300 research publicationson the fundamental science/chemistry of the materials,components,systems,applications,developments and so on,during the past 25years.

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