

# Phase change solar container wood preparation technology





## Overview

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To address the low efficiency and flammability of wood-based phase change materials (WPCMs) in solar energy storage, this study developed a series of WPCMs (PEG/TPP/DW-P) with both flame retardancy and solar-thermal energy storage properties by vacuum-impregnating. Herein, a multifunctional composite phase change material (CPCM) is developed using a balsa-derived morphology genetic scaffold, engineered via bionic catechol surface chemistry. The scaffold undergoes selective delignification, followed by a simple, room-temperature polydopamine (PDA) modification.



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2MW / 5MWh  
Customizable

### Phase Change Materials in Food Packaging: A Review

Phase change materials (PCMs) are a class of thermoresponsive or thermoregulative materials that can be utilized to reduce temperature fluctuations and provide cutting-edge thermal ...

### Use of phase change materials in wood and wood-based composites

...

"Solvent-free preparation of bio-based polyethylene glycol/wood flour composites as novel shape-stabilized phase change materials for solar thermal energy storage," Solar Energy Materials and ...



### Bio-based poly (lactic acid) shaped wood-plastic phase change

In order to overcome the drawbacks of solid-liquid phase transition such as large volume change and requirement for container for the liquid phase, the exploration of preparing shape-stable ...

### Composite phase-change materials for photo-thermal conversion and

Organic phase-change materials can absorb or release a large amount of latent heat during the solid-liquid phase transition, whereas a functional carrier material can enhance the ...



### Wood products with advanced solar-to-thermal conversion and phase

This smart wood product provides a cost-effective, highly stable, and easy-to-implement solution for energy conversion and thermal management technologies.



### Form-Stable Phase Change Material with Wood-Based Materials as ...

Building shape-stable phase change materials (PCMs) are crucial for their practical applications. Particularly, it is vital to utilize renewable/recyclable biomass media as the support ...



### Wood products with advanced solar-to-thermal conversion and ...

The weight and density of Fe<sup>3+</sup>@DP-wood were unchanged compared with DP-wood. PEG and HDI, were impregnated into the pores of the Fe<sup>3+</sup>@DP-wood under vacuum, leading to in ...





### **Carbonized-wood based composite phase change materials loaded ...**

The combined microscopic and macroscopic test results showed that the modified carbonized-wood provided a good support structure for the paraffin wax (PW) to prepared ...



### **Wood-based phase change energy storage composite material with**

With the continuous increase in global energy demand and environmental challenges, the efficient utilization and storage of energy have become critical areas of scientific research. This ...

### **Preparation of phase change Heat storage wood with in-situ ...**

Wood has been developed with phase change heat storage function using balsa as a natural packaging material, and PEG was employed as a material for phase change heat storage ...



### **A novel approach for constructing plantation wood-based phase change**

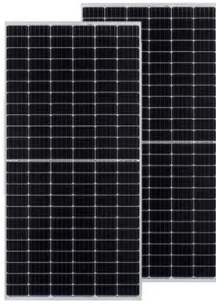
This novel approach, designed to simultaneously achieve robust phase-change energy storage, superior mechanical performance and dimensional stability without relying on ...



## Flame-retardant wood-based composite phase change materials

...

The current research has very broad application potential in the practical application of WPCMs as buildings. Graphical Abstract Wood-based composite phase change materials based on ...



## Experimental investigation of solar chimney with phase change ...

The effect of latent heat storage (LHS) on a solar chimney pilot was studied experimentally. Two kinds of experiments including with and without phase change material (PCM) ...

## Scalable Fabrication of Light-Responsive Superhydrophobic ...

Abstract The growing demand for sustainable energy storage solutions has underscored the importance of phase change materials (PCMs) for thermal energy management. However, traditional PCMs are ...



## Bioinspired wood-based composite phase change materials for ...

Here, a coupling solution based on microencapsulated phase change materials (MPCMs) that integrates photothermal effect and phase change thermal storage is proposed.



## An ultrastrong wood-based phase change material for efficient

Phase change material is an energy storage substance that can store and release thermal energy via reversible crystalline transformation [8,9]. The application of PCM provides a ...

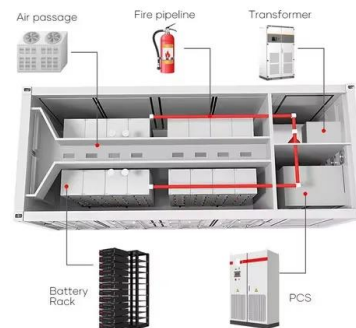


## Flame-retardant wood-based composite phase change materials

Wood-based composite phase change materials based on polydopamine functionalized carbon dots for efficient solar-to-thermal energy storage and flame-retardant applications. Discover ...

## Processing wood into a phase change material with high ...

In this work, a composite phase change material is prepared by introducing stable polyethylene glycol-based energy storage polymer (PGMA) into the porous structure of delignified ...



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