

**JH Solar**

# **Patented phase change energy storage heating**



## Overview

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Thermal energy storage offers the distinct benefit of managing temperatures inside buildings — a process that is more important every year as temperatures rise and heatwaves become more severe. These systems capture heat during the day and passively release it at night as temperatures drop.

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A thermal energy storage system utilizes a phase change material with an encapsulating material surrounding the phase change material. The encapsulating material fully contains the phase change material to prevent passage of the phase change material out of the encapsulating material and/or prevent.

Chinese patent 202010383587.4 disclosed an interlayer ventilation type phase change heat storage structure and a laying method thereof, and provided an interlayer structure consisting of a phase change heat storage bag based on macro packaging; the heat storage or release rate of phase change.

[0001] The present invention relates to a storage system of refrigeration or thermal energy through the use of phase change materials (PCM), in particular for air conditioning or heating of domestic, working, shopping, etc. environments. [0002] More particularly, the invention relates to a.

Systems for storing and retrieving thermal energy in encapsulated phase change material are disclosed. Thermal energy is substantially stored and/or retrieved in the form of latent heat. The capsules comprise an outer shell which is impervious to both the heat transfer fluid within which they are.

Thermal energy storage system comprising encapsulated phase change

material Methods of encapsulating a phase change material in a capsule including suspending a particle of the phase change material in an air stream, coating an entire surface of the suspended particle with at least one layer of a.

## Patented phase change energy storage heating

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### [US20240263806A1](#)

An opening in the front part of each phase change heat storage module faces an interior of the passive phase change energy storage sunlight room, and the phase change heat storage ...

### [WO2019179197A1](#)

A modular phase-change energy storage heat exchanger. Phase-change materials are filled around circulating-water conveying pipes (13) and antifreeze fluid conveying pipes (12) in a ...



### **U.S. Patent for Solar phase-change energy storage heating**

...

A solar phase-change energy storage heating ventilation partition wall and modular heating system thereof, the partition wall consists of a solid partition wall (1), a thermal ...



### **Thermal energy storage system comprising encapsulated phase ...**

Systems for storing and retrieving thermal energy in encapsulated phase change material

are disclosed. Thermal energy is substantially stored and/or retrieved in the form of latent heat.



### CN101871706A

The invention relates to a phase-change energy-storage heat pump water heater, which comprises a compressor, a condenser, a throttling device A and a heat exchanger which are ...



### Phase change material storage heater (Patent) , DOE Patents

A thermal energy transport and storage system is provided which includes an evaporator containing a mixture of a first phase change material and a silica powder, and a ...



### Phase change materials: classification, use, phase transitions, ...

Currently, there is great interest in producing thermal energy (heat) from renewable sources and storing this energy in a suitable system. The use of a latent heat ...



## CN113587200A

The invention discloses a solar phase-change energy-storage heat-supply ventilating partition wall and a modular heat supply system thereof, wherein the partition wall is composed of a solid ...



## Refrigeration, or thermal, energy storage system by phase change ...

More particularly, the invention relates to a system that allows to maximize the transfer of refrigeration or thermal energy between a material of the PCM type and a refrigeration or ...

## US12331974B2

A system includes a heat pump including a system for conveying a refrigerant fluid between two heat exchangers, the refrigerant fluid circulating through a closed circuit; at least two heat ...



## Phase change energy storage material

The invention discloses a phase change energy storage material, which comprises: Antarctica, a nucleating agent, a thickening agent and a heat conducting agent, wherein the nucleating ...

## Recent Patents on Phase Change Materials and Systems for Latent Heat

Among the existing technologies for storing thermal energy, latent heat storage appears to be of huge interest since it can lead to reduced size and cost. This paper reviews various recent ...

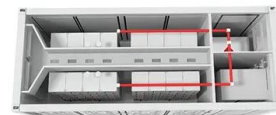


## Polymer engineering in phase change thermal storage materials

Abstract Thermal storage technology based on phase change material (PCM) holds significant potential for temperature regulation and energy storage application. However, ...

## Passive phase-change energy storage sunlight room and air source heat

An air source heat pump and phase change energy storage technology, which is applied in the field of heating systems coupled with sunlight, can solve the problems of inability to release ...

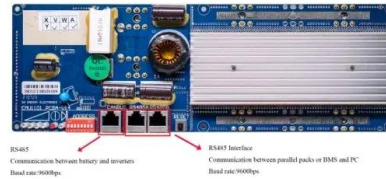


## Phase-change heat storage electric water heater

The phase-change heat storage electric water heater solves the technical problems of reducing the volume of the water heater, increasing the pressure bearing capacity, reducing the waiting ...

## Thermal energy storage makes the leap to commercial usage

How thermal energy storage works Thermal energy storage captures and stores energy in the form of heat using materials like molten salt, phase change materials (PCMs), or ...



## Photovoltaic-phase change energy storage system and method

A solar photovoltaic powered phase change material thermal energy storage system includes a refrigerator unit having a phase change material (PCM) tank and a photovoltaic (PV) panel to ...

## DOE Patents Patent: Phase change thermal energy storage

...

A thermal energy storage system includes a phase change composition including a phase change material. The phase change composition has a first melting temperature at a first hydration ...



## High-Temperature Phase Change Materials (PCM) ...

To store thermal energy, sensible and latent heat storage materials are widely used. Latent heat TES systems using phase change material (PCM) are useful because of their ability to charge ...



## Phase Change Energy Storage Thermos: The Patent That's ...

But hold onto your mittens, because phase change energy storage thermos patents are flipping the script. Imagine a bottle that keeps drinks ice-cold for 24 hours without sweat-inducing ...



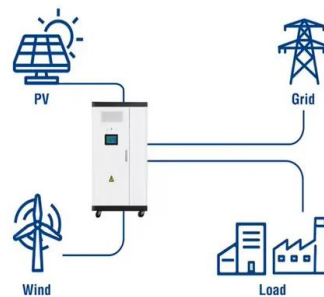
## [US20200408471A1](#)

The shaped phase-change energy-storage insulation board is composed of an inorganic composite phase-change material and a packaging sheet. The inorganic composite phase ...

## Recent developments in phase change materials for energy storage

In particular, the melting point, thermal energy storage density and thermal conductivity of the organic, inorganic and eutectic phase change materials are the major ...

### Utility-Scale ESS solutions





## REFRIGERATION OR THERMAL ENERGY STORAGE ...

Description [0001] The present invention relates to a storage system of refrigeration or thermal energy through the use of phase change materials (PCM), in particular for air conditioning or ...

## Solar water heaters with phase change material thermal energy storage

Latent heat thermal energy storage is one of the most efficient ways to store thermal energy for heating water by energy received from sun. This paper summarizes the ...

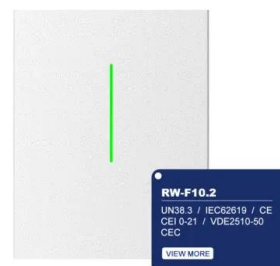


## How Do Heat Batteries Work

Sunamp heat batteries are energy-saving thermal stores with Plentigrade at their core. Plentigrade is our high-performance phase change technology platform that delivers heating or cooling reliably, safely and efficiently. Our ...

## Heat Storage Patents (Class 165/902)

Abstract: The present invention provides an energy-storing temperature control material, and belongs to the technical field of temperature control materials. In the energy ...



## CN115751719A

The invention relates to a phase-change energy storage type electric water heater, which comprises a water heater shell, a first phase-change heat storage module, a second phase ...



## Next generation thermal storage

PhaseStor Benefits PhaseStor systems use BioPCM, a patented plant-based phase change material, to store large quantities of thermal energy in the form of latent heat.



## Compact thermal energy storage for hot water, heating & cooling

Thermal energy storage solutions that make homes, buildings & vehicles more energy-efficient & sustainable while reducing carbon emissions.

## CN201503135U

The utility model relates to an electric water heater, in particular to a phase-change energy storage electric water heater, which comprises a shell and an inner liner arranged in the shell. ...





## Phase change thermal energy storage: Materials and heat ...

This paper systematically reviews the latest research progress in phase change thermal energy storage from three perspectives: the characteristics and thermal property ...

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