Phase change energy storage heat pipe

Phase change materials (PCMs) used for the storage of thermal energy as sensible and latent heat are an important class of modern materials which substantially ...

The thermal energy storage system in this study consists of a square container, finned heat pipes, and potassium nitrate (KNO3) as the phase change material. The charging ...

A novel GAHP-TSU (gravity-assisted heat-pipe thermal storage unit) is presented, in which the composite granular solid-liquid PCM (phase-change material) is piled up as the ...

Abstract This study presents a comprehensive investigation into thermal energy storage (TES) utilizing phase change material (PCM), involving modifications in inner tube ...

However, during the utilization of heat pipes in electronics for effective cooling, a quantifiable amount of heat is lost through the heat pipe"s adiabatic section. This heat lost ...

The different ways of coupling heat pipes to phase change materials and the research progress in different applications are summarized, and the advantages and potentials of the different ways ...

The electric vehicle industry is becoming an increasingly important part of the automotive industry, and the high operating temperature requirements of the batteries at the ...

This work aims to improve the efficacy of phase change material (PCM)-based shell-and-tube-type latent heat thermal energy storage (LHTES) systems utilizing differently ...

Abstract Heat transfer enhancement and optimization are found to be essential for the PCM (phase change material) thermal energy storage design. In this work, the ...

In this paper, a heat pipe-assisted phase change material (PCM) based battery thermal management (BTM) system is designed to fulfill the comprehensive energy utilization ...

Heat pipe coupled Latent Heat Thermal Energy Storage (LHTES) is a commonly used technique for improving heat storage, due to its advantages such as heat conduction, isothermal, and ...

For the sake of store the ship"s waste heat efficiently, a new type of oscillating heat-pipe phase-change energy storage device was designed, which couples the oscillating ...

This issue affects the rate of energy storage (charging/discharging) in PCMs. Many researchers have proposed

different methods to cope with this problem in thermal ...

The low thermal conductivity of phase change materials (PCMs) limits their large-scale application in the field of thermal storage. The coupling of heat pipes (HPs) with PCMs is ...

As a key component of heat transfer, heat exchangers are essential for ensuring the efficiency and stability of energy storage systems [[15], [16], [17]]. In the field of phase change energy ...

With increase in global temperature, worsening of environmental conditions and a shortage of energy resources, countries around the world are actively developing the use of ...

In conclusion, the composite energy storage pipeline with PCM was used for oil transportation process, and the heat transfer model required for its thermal insulation ...

This paper proposes a novel phase-change thermal storage device that utilizes microchannel parallel-flow flat pipes with a paraffin/expanded graphite composite as the phase change ...

Highlights o Comparison of different latent heat thermal energy storage systems with heat pipes. o Assessment of replacing a heat transfer fluid piping system by heat pipes. o ...

The growing global economic expansion has intensified energy supply-demand imbalances, positioning energy conservation as a pivotal strategy for reconciling economic development ...

Assessing sustainable latent heat energy storage of RT 35 phase change material in double pipe heat exchangers: A study on concentric and hairpin designs

Confronted with above issues, this article proposes a thermal-energy management method based on heat pipe-assisted hybrid foam/paraffin phase change material ...

In the present study, the thermal characteristics of a finned heat pipe-assisted latent heat thermal energy storage system are investigated numerically. A transient two ...

Malan DJ, Dobson R, Dinter F. Solar thermal energy storage in power generation using phase change material with heat pipes and fins to enhance heat transfer. Energy ...

Thermal storage technology has received increasing attention under the policy of encouraging the development of renewable energy and ...

In this paper, influence of void ratio on phase change of thermal storage unit for heat pipe receiver under microgravity is numerically simulated. Accordingly, mathematical ...

Phase change energy storage heat pipe

A combination of high energy density in a constant temperature process [1], [2] describes the Latent heat storage (LHS) technology as opposed to Sensible heat storage ...

Phase change thermal storage is a crucial component of the energy storage sector, as it can address the mismatch between heat supply and demand in time and space, as well as ...

In the domains of low/zero carbon energy, the ship energy storage system, coupled with phase-change storage and release technology, holds significant importance. The ...

In the context of dual-carbon strategy, the insulation performance of the gathering and transportation pipeline affects the safety gathering and energy saving ...

A novel energy storage system for latent heat recovery in solar still using phase change material and pulsating heat pipe Pooria Khalilmoghadam a, Abbas Rajabi-Ghahnavieh ...

Abstract Heat pipes and thermosyphons--devices of high effective thermal conductivity--have been studied for many years for enhancing the performance of solid, liquid ...

Thermal storage systems play an increasingly important role in ensuring the efficient and stable operation of energy systems and present a key approach of utilizing energy ...

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