Heat pipe energy storage heat exchanger

How does a heat exchanger work?
The heat exchanger incorporated 95 heat pipes to enhance the heat transfer rate from the hot to the cold side by minimizing the total thermal resistancewith the aid of the high effective thermal conductivity of the heat pipes.

Why are heat pipes used in energy storage systems?
Heat pipes have been used extensively in a variety of energy storage systems. They are suited to thermal storage systems,in particular,in the role of heat delivery and removal,because of their high effective thermal conductivityand their passive operation.

What is a heat pipe heat exchanger?
In comparison with traditional heat exchangers, heat pipe heat exchangers indicate high compactness, a flexible arrangement, complete separation of hot and cold fluids, good isothermal operations, etc. As a result, heat pipe heat exchangers have attracted wide attention and application in various fields in recent years.

Can a heat exchanger be used in a residential heat recovery system?
Diao et al. designed a small flat-plate heat pipe heat recovery device as the core heat transfer component of a residential heat recovery system. Jing et al. applied an air-water heat exchanger based on a micro-heat pipe array in data centers and investigated the performance of the heat exchanger under different operating conditions.

What is a PCM-heat pipe heat exchanger?
The PCM-heat pipe heat exchanger (PCM-HPHX) Another relatively common heat exchanger configuration is the PCM-HPHX which utilizes a phase change material(PCM) to store (release) thermal energy from (to) one or more heating (cooling) fluids.

Can heat pipe heat exchanger reduce energy consumption in hospital room HVAC system?
Utilizing heat pipe heat exchanger to reduce the energy consump-tion of airborne infection isolation hospital room HVAC system. J Build Eng. 2021;35:102116. 3. Ibnu Hakim I, Sukarno R, Putra N. Utilization of U-shaped finned heat pipe heat exchanger in energy-efficient HVAC systems.

The results demonstrate that the compact fins significantly enhanced the heat transfer capacity of the ice storage unit. Additionally, the heat transfer performance was optimized with a fin spacing of d = 4 mm. ... Heat pipe based cold energy storage systems for datacenter energy conservation. Energy, 36 (5) (2011), pp. 2802-2811, 10.1016/j ...

Today"s heat storage technologies mainly include sensible heat energy storage, latent heat energy storage (phase change energy storage), and thermochemical energy storage. ... The farther the hole is from the heat

transfer fluid (HTF) pipe, the stronger the heat conduction and the weaker the convection. There is an optimal balance between heat ...

Once the pipes/exchangers are hot, I remove the reactor and turn on the power switch. That way I charge accumulators only with the energy stored as heat and so I can measure the amount of energy. Here are the results: a heat exchanger warmed up to 999C stores 538MJ, equivalent to 107 accumulators. a heat exchanger warmed up to 998C and a pipe ...

Researchers have proved the effect of foam metal in improving the thermal conductivity and temperature uniformity of PCM through heat transfer experiments [21, 22], visualization experiments [23], theoretical calculations [24] and numerical simulations [25, 26].Sathyamurthy et al. [27] used paraffin as an energy storage medium in recycled soda cans ...

A regenerative heat exchanger, or more commonly a regenerator, is a type of heat exchanger where heat from the hot fluid is intermittently stored in a thermal storage medium before it is transferred to the cold fluid. To accomplish this the hot fluid is brought into contact with the heat storage medium, then the fluid is displaced with the cold fluid, which absorbs the heat.

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Energy saving via heat pipe heat exchanger in air conditioning applications experimental study and economic analysis. J. Build. Eng., 35 (2021), Article 102053. View PDF View article View in Scopus Google Scholar [15] B. Zare, M. Kahani, M. Zamen, F. Salek.