Heat exchange and energy storage

Energy storage is essential to unlocking the full potential of renewable energy. Alfa Laval supports the transition to a decarbonized future with advanced heat ...

The fluid exits this heat exchanger at a low temperature and returns to the solar collector or receiver, where it is heated back to a high temperature. Storage ...

The process of storing/releasing thermal energy of LTES systems mainly relies on heat exchangers, one special device for exchanging heat between heat transfer fluids ...

The performance of thermal energy storage heat exchangers is determined by the exchanger structure and the heat transfer fluid (HTF) parameters. In this paper, the heat ...

The principle of TES in a double-tank heat exchange fluid is as follows: TES medium and cold storage medium are respectively stored in two tanks, and the hot and cold ...

A heat exchanger of thermal energy storage is used for separating two fluids, storage medium, and heat transfer fluid (HTF). There are two types of pipe in the heat ...

Thermal energy storage (TES) offers a cost-effective alternative to expensive battery-based systems which can be used to alleviate these issues [2], [3], [4]. The use of ...

Since thermal storage and heat exchanger (TSHE) technology plays an important role in advanced compressed air energy storage (CAES) systems, this chapter will introduce ...

In this paper, the unsteady effect of a heat exchanger for cold energy storage (Hex-CES 1) in a liquid air energy storage system is studied. The numerical model of the ...

This study presented a simplified, cost-effective, and efficient design of a plate heat exchanger thermal energy storage system and compared the performance and efficiency ...

A new concept of a staged moving bed particle heat exchanger comprising flow constrictions in multiple short stages is presented. This concept allows for a simpler design, ...

The overall heat transfer coefficient of the honeycomb heat exchanger has an average value of 147 W m-2 K -1. Though promising results have been obtained, ...

Abstract. Recently, there has been a renewed interest in solid-to-liquid phase-change materials (PCMs) for

thermal energy storage (TES) solutions in response to ambitious ...

In this work, the effects of heat transfer fluid (HTF) temperature and flow velocity on energy storage/release characteristic in shell and tube phase change heat exchanger were ...

This paper presents an optimization study of the thermal performance of a double U-tube borehole heat exchanger (BHE) with two independent circuits that can be used ...

Thermal energy storage using PCMs enables the lowering of the maximum heat dissipation required by storing thermal energy in the PCM, which allows size reduction of ...

In this paper, a new analytical approach for aiding design choices in solid thermal energy storage with tubular heat exchangers was proposed based on thermo-mechanical ...

Thermochemical Storage of solar heat exploits the heat effects of reversible chemical reactions for the storage of solar energy. Among the possible reversible gas-solid ...

The plate heat exchanger thermal energy storage system is recognized as a highly efficient form of latent heat thermal energy storage. However, existing studies show that ...

Heat exchangers are critical components in thermal energy storage (TES) and conservation systems, where efficient thermal management is essential for maximizing energy ...

This review aims to identify potential methods to design and optimise LTES heat exchangers for heat recovery and storage, bridging the knowledge gap between the present ...

Heat exchangers are among the principal components of cryogenic systems. To achieve good overall energy performance of the system, which is mostly determined by the ...

The thermal characteristics of the heat exchanger such as heat transfer coefficient, effectiveness, efficiency, water exit temperature, heat storage rate, total energy ...

This paper presents the development of a novel heat exchanger design incorporating optimized "I"-shaped copper (Cu) fins to enhance thermal performance and ...

The structure of the direct heat exchange type TESU consists of a heat exchange part and a thermal energy storage (TES) material. The heat exchanger is installed ...

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