



Research on energy storage dehumidification performance

Download Citation | On Jul 1, 2023, Weishuang Guo and others published Experimental study on cooling and dehumidification performance of an ice storage air conditioner used in underground refuge ...

With advent of new super high capacity desiccant materials, PNNL has conceived a next generation dehumidification product that: 1) provides independent or separate control of sensible and latent cooling (SSLC) loads to reduce energy consumption in high-performance buildings and humid environments, 2) allows more direct control of indoor ...

A comparative analysis of the effects of glass-fiber desiccant wheels (GF DWs), aluminum desiccant wheels (Al DWs), and commercial desiccant wheels (CM DWs) on ...

The effect of the match relationship between the desiccant materials and PCM thermal energy storage on the performance of the novel system is then studied using a dynamic mathematical model.

Dehumidification is one of the key challenges facing the air conditioning (AC) industry in the treatment of moist air. Over many decades, the dual role of heat exchangers of AC chillers for the ...

Photovoltaic thermal (PVT) systems are attracting a significant amount of attention in research because they can generate electricity outside of daytime hours, unlike photovoltaic (PV) systems, and can increase efficiency and collect additional energy by reducing the temperature of PVT panels. However, a somewhat lower amount of collected energy is ...

To overcome the intermittency and variability of solar energy due to climatic factors, dehumidifiers and heat storage system may be used. Dehumidifiers are capable of recovering waste heat from drying chambers and reducing electricity consumption by using low-grade energy sources such as air. Therefore, the combination of solar energy ...

dehumidification is possible that limits overcooling and energy use. Recent testing of a new variable capacity system measured indoor humidity reduction of up to 15% RH points during

By employing a carbon dioxide heat pump, their results indicated significant improvements, with power consumption and dehumidification performance reduced and ...

The heat and mass transfer of liquid desiccant for dehumidification and cooling has been investigated in recent years as a promising energy-efficient technology to improve indoor thermal comfort.

A hybrid system is proposed for small-scale electricity and fresh water supplies. o The combined heat - isobaric compressed air energy storage manages renewable power.. Waste heat of energy storage is used to



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drive humidification dehumidification unit.. The thermo-economic analysis is implemented to evaluate the system performance.

In this paper, the solid desiccant adsorption packed bed with a three-stage internal cooling (ICSPB) has been proposed to improve the dehumidification efficiency and make a comparison with that of non-internal cooling. To ...

The evolution of an in-depth understanding and accurate prediction of the dehumidification performance of a solid desiccant coated heat exchanger dehumidifier (SDHED) is severely limited by the ...

Download Citation | Research on Falling Film Dehumidification Performance of Microencapsulated Phase Change Materials Slurry | In the process of liquid desiccant dehumidification, the temperature ...

Due to the wide application of floor heating systems, the radiant floor cooling systems has developed rapidly in recent years. In this paper, TRNSYS numerical simulation methods are used to study the influence of chilled water supply temperature and flow rate on the cold storage characteristics of a standard floor structure for office buildings in northern China. ...

The enhanced energy performance of desiccant dehumidifiers through new material synthesis and optimized design have extended their potential to several state-of-the ...

This study examines the structural dimensions, dehumidification performance, energy performance, economic aspects, and environmental impact of various dehumidification ...

Request PDF | Performance assessment of PCM-based solar energy assisted desiccant air conditioning system combined with a humidification-dehumidification desalination unit | In this study, the ...

The developments on liquid desiccant air-conditioning systems were illustrated and summarized in this paper. In order to obtain a better dehumidification (or humidification) performance, liquid desiccant should be cooled (or heated) rather than air. Two fundamental modules were proposed, including basic spray module with extra heat exchanger and total ...

The liquid desiccant cooling system (LDCS) is a viable alternative to conventional air conditioning systems in hot and humid climates because it uses low-grade energy and is environmentally friendly. The critical components of the LDCS are the dehumidifier and regenerator. The focus of the study is to build a compact system by combining a dehumidifier ...

Humidification-dehumidification desalination system with inbuilt heat storage unit. o The solar air heater of 4.687 m² effectively supplies thermal energy for an addition 3 h.. Experimental comparison of H-DH system with and without inbuilt heat storage unit.



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In the humidification and dehumidification solar desalination system, the recovery of vapor condensation latent heat is the key problem. Using a cascaded phase change heat storage method to recover vapor condensation latent heat can improve the phase change heat storage rate and the water production performance of dehumidifier. The exergy analysis ...

References [1] H. W. Ai, The research of advanced energy storage system for air-conditioning and heating system based on exergy analysis, Master Thesis, College of Power Engineering. ... Ding, J. Ding, X. X. Yang, Dehumidification performance and exergy efficiency analysis of desiccant rotary wheel, Journal of Guangzhou University (Natura ...

Research Paper Experimental evaluation of desiccant dehumidification and air-conditioning system for energy-efficient storage of dried fruits Muhammad H Mahmood¹, Muhammad Sultan¹ and Takahiko ...

DOI: 10.1016/j.applthermaleng.2023.122262 Corpus ID: 266514296; Simulation optimization and energy consumption evaluation on the wood solar drying kiln with heat storage and dehumidification system

Using a cascaded phase change heat storage method to recover vapor condensation latent heat can improve the phase change heat storage rate and the water production performance of dehumidifier.

In this study, the numerical investigation has been conducted to evaluate the energy and exergy performance of multiple cascading deep dehumidification systems assisted ...

Mechanical energy storage method has geographical constraints such as in the case of Compressed Air Energy Storage systems, whereas electrical and chemical are prone to high losses in large scale ...

The respective dehumidification performance of two tube-fin and annular-fin DCHE configurations was observed to record 7% and 40% improvement in moisture removal ...

In a liquid desiccant dehumidifier, the air-to-solution flow direction plays an important role in the dehumidification performance and the physical size of the dehumidifier tower. In this research ...

This paper investigates the dehumidification performance of desiccant wheel (DW) with different fiber paper (FP) substrates such as wood pulp, glass fiber, ceramic fiber, Nomex fiber, and brown ...

These dehumidification improvements were attributed to the better waveguide and chamber design, demonstrating the sensitivity of water molecules desorption ...

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