Hollow concrete ball energy storage patent

An energy storage system converts variable renewable electricity (VRE) to continuous heat at over 1000° C. Intermittent electrical energy heats a solid medium. Heat from the solid medium is delivered continuously on demand. An array of bricks incorporating internal radiation cavities is directly heated by thermal radiation. The cavities facilitate rapid, uniform heating via reradiation.

An energy storage device can include a first electrode, a second electrode and a separator between the first electrode and the second electrode wherein the first electrode or the second electrode includes elemental lithium metal and carbon particles. A method for fabricating an energy storage device can include forming a first electrode and a second electrode, and ...

Development of Hollow Steel Ball Macro-Encapsulated PCM for Thermal Energy Storage Concrete Zhijun Dong 1, Hongzhi Cui 1,*, Waiching Tang 2, Dazhu Chen 1 and Haibo Wen 1 Received: 7 December 2015; Accepted: 13 January 2016; Published: 19 January 2016 Academic Editor: Luisa F. Cabeza

Development of structural-functional integrated energy storage concrete with innovative macro-encapsulated PCM by hollow steel ball[J] Appl. Energy, 185 (2017), pp. 107-118. View PDF View article View in Scopus Google Scholar [18]

This paper presents novel hollow concrete blocks that were manufactured on-site using four variants of materials of the blocks (perlite, vermiculite, scoria, and polystyrene) for commercial viability. ... "A systematic review of thermal insulation performance of hollow bricks as a function of hollow geometry," Int. J. Ambient Energy. Taylor ...

@article{Bu2021LowHE, title={Low hydration exothermic well cement system: The application of energy storage microspheres prepared by high-strength hollow microspheres carrying phase change materials}, author={Yuhuan Bu and Rui Ma and Huajie Liu and Chuanhua Ma and Xuezhan Zhao}, journal={Cement & Concrete Composites}, year={2021}, volume={117 ...

The latest generation of this energy storage system consists of a box-shaped structure. The mode of operation is always the same. ... the ocean has everything needed for it: ample space and water and enough of a pressure gradient. If hollow concrete balls 30 meters (about 100 feet) in diameter are lowered to the ocean floor and a valve opens up ...

Energy Vault says the towers will have a storage capacity up to 80 megawatt hours, and are best suited for long-duration storage with fast response times. . News and Insights from Singularity Group. search ... A Startup That"s Storing Energy in Concrete Blocks Just Raised $100 Million. By Vanessa Bates Ramirez.

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September 1, 2021.

the article discloses a pumpkin-shaped, underwater, compressed-air-storage devices being trialed at the University of Nottingham. It is described that the compressed-air-storage devices, constructed from steel and polymer, are designed to be pumped full of high-pressure air during times of high winds and low demand, with the stored energy used to turn turbines to create ...

An energy storage microsphere, prepared by encapsulating phase change materials in high-strength hollow microsphere, was proposed in this paper.The research objective was designed to utilise energy storage microspheres (ESM) in the cement mixture to achieve low hydration exothermic, without negatively affecting other properties. In this study, ESM were ...

The specific heat of concrete plays a crucial role in thermal energy storage systems, facilitating the efficient storage and release of thermal energy to optimise energy management and utilisation. The specific heat of concrete is a key factor considered by engineers and researchers in the design and optimisation of TES systems.

Graphene is the most hyped material of the 21st century - but 20 years after its discovery, the promised transformation of everything from space technology to energy storage has yet to happen, held back by the challenges of large-scale production and quality control.

A 1978 Patent for Solar Heat Storage Using Concrete Blocks. On December 5, 1978, U.S. patent #4127973 was issued for a "Solar-Heated Concrete Slab Building Structure." ... The basic idea presented in this patent is the use of a layer of hollow concrete blocks below a concrete slab floor, with the hollow concrete blocks lined up so that air ...

The hollow steel ball (HSB) was selected as a carrier to encapsulate PEG-600 for the preparation of PCM-HSB (shown in Fig. 2). The parameters of HSB are shown in Table 2. HSB was drilled by a 2.5 mm diameter bit in a non-weld position. ... This study obtained a new phase-change energy storage concrete using steel balls encapsulated with PEG-600 ...

Concrete with macro-encapsulated octadecane-HSB was capable of reducing the peak indoor air temperature and the fluctuation of indoor temperature and can be very effective in transferring the heating and cooling loads away from the peak demand times. The application of thermal energy storage with phase change materials (PCMs) for energy efficiency of buildings grew rapidly in ...

Applied Energy, 2017, vol. 185, issue P1, 107-118 Abstract: Phase change materials (PCMs) have great potential for applications in energy efficient buildings. In this study, an innovative method of macro-encapsulation of PCM using hollow steel balls (HSB) was developed and the thermal and mechanical performance of PCM-HSB concrete was examined.

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Seaworthy concrete sphere anchors renewable energy storage test ACI 323 publishes Low-Carbon Concrete Code Requirements ... The U.S. Patents are designated 9,878,951, "Hollow-Core Articles and composite materials, methods of production and uses thereof;" 9,938,189, "Pervious composite materials, methods of production and uses thereof ...

The present study aims to perform structural, sustainability and economic analysis of reinforced concrete (RC) slabs bubbled/voided using hollow plastic balls made from waste PET (Polyethylene Terephthalate) water bottles. The experimental program consists of five slab specimens having dimensions 1850 × 460 × 110 (mm). One reference slab was cast as ...

Flexible cooling system with thermal energy storage CN111981873A (en) * 2020-05-09: 2020-11-24: : Hot melt type gas-liquid double-phase heat exchanger WO2022026292A1 (en) * 2020-07-28: 2022-02-03: Rocky Research: Thermal energy storage system with nucleation cooling US11435145B2 (en) 2020-07-28

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