Low Heat Loss Latent Heat Battery (LHB)

Tech ID: 33580 / UC Case 2022-612-0

ABSTRACT

Researchers at the University of California, Davis have developed a green technology designed for the efficient storage and discharge of heat energy sourced from intermittent green energy supplies.

FULL DESCRIPTION

The AlSi Latent Heat Battery (LHB) is a green technology that enables the storage of heat energy from intermittent sources such as photovoltaics, direct solar insulation, and wind turbines. This stored energy can be utilized for various heat applications ranging between 50°C and 550°C, or for generating electricity. Notably serving as a low-cost, efficient alternative to conventional energy storage systems, the LHB is especially beneficial when integrated with solar power systems for facilitating completely off-grid electricity and heat solutions. It uses aluminium-silicon alloy (AlSi) to store energy in the form of heat, which can be converted into electricity or used directly as thermal power when needed. This is possible due to a vacuum-insulated container that limits the loss of stored thermal energy. Built from corrosion-resistant metal or possibly high-temperature ceramic material, the container's design aims to prolong the efficiency of the energy stored. This latent heat battery can be charged using various renewable sources like solar, wind power or non-renewable sources when available.

APPLICATIONS

- Solar cell systems requiring energy storage solutions.
- Wind turbine systems seeking LHB energy storage options.
- Residential heating applications, including those by the National Association of Home Builders.
- Camping and outdoor activities that require portable heat, cooking, and electricity solutions.
- RVs, motor homes, and home trailers requiring independent heat and electricity.
- Off-grid and remote area heating and electricity provisions.
- Military applications for mobile heating and electricity.

FEATURES/BENEFITS

- Enables storage and efficient utilization of intermittent green energy sources.
- Operates across a wide temperature range (50°C to 550°C) for versatile applications.
- Provides a low-cost alternative to existing energy storage solutions.
- Facilitates complete off-grid systems for electricity and heating needs.
- Supports 24/7 heat energy applications and electricity generation.
- Addresses intermittency and storage issues related to green energy sources.
- Lowers high costs and limitations of current energy storage technologies.
- Relieves dependency on grid power, especially in remote and off-grid locations.
- Solves lack of sustainable solutions for heating and electricity in varied temperature ranges.

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Silicon Solar Cells that Absorb Solar Photons Above 2.2 eV and are Transparent to Solar Photons Below 2.2 eV
- Efficient Solar Energy Conversion to Electricity

CONTACT

Andrew M. Van Court
amvancourt@ucdavis.edu
tel: .

INVENTORS

- Najm, Majdi A
- Woodall, Jerry M.

OTHER INFORMATION

KEYWORDS

battery, latent heat, low heat loss, thermal energy storage, thermal load, thermal insulation

CATEGORIZED AS

- **Energy**
  - Solar
  - Storage/Battery
  - Wind
- **Environment**
  - Other
- **Engineering**
  - Engineering
  - Other
- **Security and Defense**
  - Other

RELATED CASES

2022-612-0

University of California, Davis
Technology Transfer Office
1850 Research Park Drive, Suite 100, ,
Davis,CA 95618

Tel: 530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax: 530.754.7620