

# Single-phase protocol for mobile energy storage containers used in steel plants





## Overview

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Can phase change material modules be used for mobile thermal energy storage?

Modular design of phase change material modules for mobile thermal energy storage. CFD modelling-based design and validation of a 400 MJ-scale novel M–TES device. Closed-loop hot air flow of up to 400 °C utilized achieving a full charge in 10 h. 97 % discharging efficiency with a mean rate and temperature of 10 kW and 195 °C.

Can phase change material improve thermal performance of compact thermal energy storage systems?

The work aims to improve the heat transfer of phase change material and analyze the thermal performance of compact thermal energy storage systems for domestic hot water applications with affordable and readily available materials. Water and granulated paraffin wax are employed, respectively, as the HTF and PCM.

What is the capacity of a mobile thermal energy storage device?

Conclusions This paper presents a model-based design study on a modular mobile thermal energy storage device with a capacity of approximately 400 MJ, utilizing composite phase change material modules.

Can a mobile thermal energy storage device address off-site industrial waste heat recovery?

Closed-loop hot air flow of up to 400 °C utilized achieving a full charge in 10 h. 97 % discharging efficiency with a mean rate and temperature of 10 kW and 195 °C. This study concerns with a modelling led-design of a novel mobile thermal energy storage (M–TES) device aimed to address off-site industrial waste heat recovery and reuse in the UK.



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