

Investigation of conducting pins in sphere filled with phase change material for enhancing heat transfer in thermal energy storage (Conference Paper)

Abstract

The utilisation of phase change material (PCM) for thermal energy storage (TES) can significantly enhance the energy savings achievable with renewable thermal systems. Sphere based packed bed systems have been used as TES for many years. However, due to the thermal resistance within these systems, the heat transfer is limited and not all the PCM can be used effectively. This study focuses on heat transfer enhancement options for single PCM sphere in a TES system. An experimental investigation has been conducted using water as the PCM. The thermal performance of plain plastic sphere containing PCM has been compared to plastic sphere encapsulated with conducting pins. The heat transfer rate of the sphere with conducting pins was more than 34% that of the sphere without pins.