

# A REVIEW ON ENHANCING THE THERMAL CONDUCTIVITY OF PHASE CHANGE MATERIALS FOR THERMAL ENERGY STORAGE

Alok kumar Ansu<sup>\*</sup>, Pooja Singh, Ravi kumar Sharma

Department of Mechanical Engineering, Manipal University Jaipur, Jaipur, Rajasthan 303007, India

\* Corresponding author

## ABSTRACT

In the recent years, the increasing population and their energy needs has leads to depletion of fossil fuels which creates the imbalance between the energy demand and supply. Phase change materials (PCMs) for thermal energy storage system has solve the issue of energy demand and supply and has aroused a lot of interest due to its high energy density and strong stability of energy output. PCMs has the capacity to store large amount of latent heat and it can store and release energy at almost constant temperature during the phase change process. Moreover, PCMs have gained in wide variety of applications such as solar water heating system, solar dryer, in buildings and power system. Despite having several advantages PCMs have low thermal conductivity which lead to the low heat transfer rate. The aim of this paper is to review the various methods which has been adopted to the enhance the thermal conductivity of the phase change materials. Thermal conductivity can be increased by adding additives of high thermal conductivity such as nano particles, carbon-based materials. Carbon based materials such as Carbon nano tubes (CNTs), carbon nano fibre (CNF) graphene and expanded graphite has increased the thermal conductivity of the PCMs to a very large extent. Besides summarizing the paper, application of PCMs in various engineering fields are also analysed.

**Keywords:** Phase change materials, thermal energy storage, thermal conductivity

