



Natural heat transfer enhancement methods in phase change material based thermal energy storage

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Abstract : Thermal energy storage (TES) using latent heat storage (LHS) material has received a greater attention due to its large energy density and isothermal operation characteristics. The major drawback of Phase Change Materials (PCMs) is their unacceptable low thermal conductivity. The effects of naturally available heat transfer improvement methods for the melting and solidification behavior of PCM are discussed. The primary techniques are the eccentricity, inclination, multi-tubes, fins, nanoparticles, porous structures such as foam, graphite, mesh, etc. The heat transfer methods decide whether the heat transfer in PCM should be convective or conductive dominated heat transfer.

Keywords: phase change material, eccentricity, inclined storage, natural convection, thermal conductivity enhancement.

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