

Enhancement of Thermal Performance of Latent Heat Solar Storage System

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Abstract : Solar energy is available abundantly in the world, but it is not continuous and its intensity also varies with time. Due to above reason the acceptability and reliability of solar based thermal system is lower than conventional systems. A properly designed heat storage system increases the reliability of solar thermal systems by bridging the gap between the energy demand and availability. In the present work, two dimensional numerical simulation of the melting of heat storage material is presented in the horizontal annulus of double pipe latent heat storage system. Longitudinal fins were used as a thermal conductivity enhancement. Paraffin wax was used as a heat-storage or phase change material (PCM). Constant wall temperature is applied to heat transfer tube. Presented two-dimensional numerical analysis shows the movement of melting front in the finned cylindrical annulus for analyzing the thermal behavior of the system during melting.

Keywords : latent heat, numerical study, phase change material, solar energy

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