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Enhance the Thermal Performance of Heat pipe using Copper Oxide (CuO) as Nanofluid

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Abstract: Heat pipes are passive heat transfer devices, it transfers heat by evaporation and condensation of working fluid partially filled in it. Heat pipe are passive heat transfer devices, it transfers heat by evaporation and condensation of working fluid partially filled in it. Thermal performance of the heat pipe with mesh type wick and charged with copperoxide nanofluid is studied and compared with that of De Ionised (DI) water as base fluid. The heat pipe filled with CuO nanofluid and DI water is evaluated for the heat supply range of 40 –200 W. The effects of inclination angle, heat input and mesh type wick structure on the thermal performance of the heat pipe are investigated. Due to the mesh type wick, heat transfer coefficient improves up to 43% at the inclination angle of 45° for the heat supply of 40-200W. Also, thermal resistance of the heat pipe is reduced by 20%, 30% and 24% respectively for horizontal, inclined and vertical positions when compared to the water as base fluid in heat pipe. Thermal performance of heat pipe increases with CuO as nanofluid compared to based fluid (DI water).

Key words:Heat pipe, Mesh type wick, CuO nanofluid, De Ionised Water, Electronic Cooling.

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