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Analysis of Heat Pipe

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Abstract: *Heat pipes are one of the most effective procedures to transport thermal energy from one point to another, mostly used for cooling. It is based on a combination of conduction and convectiveheat transfer, what makes it to a complex heat transfer problem. This project work is to perform theoretical analyses and review literature for the sake of Heat Pipe Heat transfer enhancement using different nano fluids. For enhancement of heat transfer in heat pipe, Nano fluid foundvital role and a new frontier in various engineering applications. This paper reviews and summarizes the work on heat pipes using nano fluids as a working medium. Various types ofnano particle with different base fluids as proved its potential to improve thermal properties of working medium in heat pipe. The effect of filling ratio, volume fraction of nano practices on thermal performance in various kinds of heat pipe with different base fluids under various operating conditions has been discussed. Mechanism of enhancement of heat transfer after utilization of nano fluids in heat pipe has been explained. Also, influence of dimensionless on thermal resistance in terms of correlation has been studied.*

Keywords: Analysis heat in pipe, transfer heat form one object to other end

REFERENCES

[1]. Asirvatham et al. (2013) experimentally investigated the effects of using silverwaternanofluid on the heat transfer performance of a heat pipe and showed a substantialreduction in thermal resistance of 76.2% and an enhancement in the evaporation heattransfer coefficient of 52.7% for 0.009% silver nanofluid. Their results demonestrated that the use of nanoparticles enhances the operating range of heat pipe by 21%compared with that of DI (De-Ionized) water.

[2]. Hung et al. (2013) experimentally demonstrated the enhancement of the thermalperformance of a heat pipe charged with Al2O3/water nanofluid. The heat pipe in thisstudy was a straight copper tube with an outer diameter of 9.52 mm and different lengthsof 0.3 m, 0.45 m, and 0.6 m. Their results showed that at a heating power of 40 W, theoptimal thermal performance of heat pipes measuring 0.3 m, 0.45 m, and 0.6 m withAl2O3/water nanofluid was 22.7%, 56.3%, and 35.1%, respectively, better than thatwith heat pipes using distilled water as the working fluid. They also stated that thethermal performance of the heat pipe decreases with nanoparticle volume concentrationat the concentrations higher than the optimum. It is due to the fact that the highconcentrations of nanoparticles lead to high water absorption, which in turn facilitatesforming a coating layer through the sedimentation of nanoparticles on the surface of theevaporation section.

[3]. Kole and Dey (2013) prepared surfactant-free and fairly stable Cu-distilled waternanofluids and observed an enhancement of ~ 15% in the thermal conductivity for 0.5%copper nanofluid at room temperature. In their experiment, the thermal resistance of thevertically mounted heat pipe with the addition of 0.5% copper nanoparticles in distilledwater was reduced by ~ 27% and also the average wall temperature of the evaporator was reduced to 14°C at an input power level of 100 W

[4]. Shafahi et al., (2010) Studied the DI water filled Heat Pipe for various angles ofinclination. For the value of heat input 80 W and inclination angle 750 deep study wasdone and DI water, CuO nanofluids were used for experimentation. By using CuO NanoFluid the temperature gradient was obtained for different lengths of pipes