

Contemplation of Thermal Characteristics by Filling Ratio of Aluminium Oxide Nano Fluid in Wire Mesh Heat Pipe

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Abstract : In this paper, the performance of heat pipe in terms of overall heat transfer coefficient and thermal resistance is quantified by varying the volume of working fluid and the performance parameters are contemplated. For this purpose Al₂O₃ nano particles with a density of 9.8 gm/cm³ and a volume concentration of 1% is used as the working fluid in experimental heat pipe. The performance of heat pipe was evaluated by conducting experiments with different thermal loads and different angle of inclinations. Thermocouples are used to record the temperature distribution across the experiment. The results provide evidence that the suspension of Al₂O₃ nano particles in the base fluid increases the thermal efficiency of heat pipe and can be used in practical heat exchange applications.

Keywords : heat pipe, angle of inclination, thermal resistance, thermal efficiency

Conference Title : ICAMAME 2015 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : March 23-24, 2015