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Mathematical Modelling and Parametric Study of Water Based Loop Heat Pipe for Ground Application

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Abstract : Loop Heat Pipe is a passive two-phase heat transfer device which can be used without any external power source to transfer heat from source to sink. The main aim of this paper is to have modelling of water-based LHP at varying heat loads. Through figures, how the fluid flow occurs within the loop has been explained. Energy Balance has been done in each section. IC (Iterative Convergence) scheme to find out the SSOT (Steady State Operating Temperature) has been developed. It is developed using Dev C++. To best of the author's knowledge, hardly any detail is available in the open literature about how temperature distribution along the loop is to be evaluated. Results for water-based loop heat pipe is obtained and compared with open literature and error is found within 4%. Parametric study has been done to see the effect of different parameters on pressure drop and SSOT at varying heat loads.

Keywords : loop heat pipe, modelling of loop heat pipe, parametric study of loop heat pipe, functioning of loop heat pipe
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