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**Investigation on the thermal performance and flow characteristics of oscillating heat pipe under different cooling conditions.** HIBAL AHMAD, SEONG KUEN KIM, SUNG YONG JUNG<sup>1</sup>, Chosun University, South Korea — The performance of the oscillating heat pipe is reliable on the oscillatory and pulsatory motions of fluid inside the capillaries. Heat load, working fluid, filling ratio and convection sources are the essential factors which influence the internal flow dynamics and heat transfer performance of oscillating heat pipe. In this study, first a two-turn closed loop oscillating heat pipe was fabricated from a Pyrex glass and then its thermal performance and internal fluid flow characteristics was investigated under active and passive cooling conditions. A 50% fill ratio methanol was used as a working fluid and heat load was provided step-wise. Flow visualization technique was used to observe the flow dynamics inside the capillaries for both active and passive cooling. The experimental result shows that internal flow dynamics and thermal performance are strongly dependent upon the cooling conditions. The velocity, acceleration and displacement of bubbles inside the capillaries are also influenced by the cooling conditions. Slug/plug flow are dominant at low heat load for both active and passive cooling while the elongated plug, annular and semi annular oscillatory flow are dominant at higher heat load. This study also reveals about the start-up performance and dry-out conditions and can be helpful to design a oscillating heat pipe based on its thermal performance and flow characteristics when different cooling conditions are applied.

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