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## Experimental study on the effect of perforations shapes on vertical heated fins performance under forced convection heat transfer



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### ABSTRACT

This paper investigates the effect of perforation shape or geometry on the heat transfer of perforated fins. The type of heat exchanger used is heat sink with the perforated fins under the forced convection heat transfer to determine the performance for each perforation shape between circular, rectangular, triangular and also with the non-perforated fins. The experimental result compared between the perforation shape and the heat transfer coefficient to clarify the best perforation shape for the plate heat sink. The fluid and heat transfer properties of plate fins or normally heat sink were studied experimentally and numerically using CFD. The difference between experimental and numerical results was reported to be about 8% and 9% for temperature distributions when the power supplied are 150 W and 100 W respectively. The highest temperature different of the fin are with the circular perforation shape which is 51.29% when compared the temperature at the tip of the fins with the temperature at the heat collector followed by the rectangular perforation shape with 45.57% then followed by the triangular perforation shape by 42.28% then lastly the non-perforated fins by 35.82%. The perforations of the fins show a significant effect on the performance of forced convection heat transfer.

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