

Experiments were carried out on natural convection heat transfer from longitudinal trapezoidal fins array heat sink subjected to the influence of orientation. A trapezoidal fins heat sink with various orientations tested under a controlled environment. Test results indicate that the sideward horizontal fin orientation yield the lowest heat transfer coefficient. However the sideward vertical fin orientation gave the best performance on the natural cooling. From the experiments  $Nu$  is determined as a function of  $Ra$  at  $Pr=0.7$  for each orientation with  $Ra$  ranging between (1400 and 3900). From the results; Heat transfer coefficient of the sideward vertical fins is higher by (12%) than the heat transfer coefficient of the upward while it is higher than the heat transfer coefficient of the downward by (26%) and by (120%) with the sideward horizontal fins. Orientation affected the temperature distribution along the fins, therefore the temperature along the sideward vertical fins have the best performance with uniform distribution, while in sideward and downward the temperature increased in the positions near the base plate surface because of the complication in moving the heated air.