

The objective of this paper is to perform an experimental study of free convection heat transfer from staggered pin fin-arrays on heated base plate. The experiments represented by studying three orientations of the fins (upward, downward and sideward). The results showed that the sideward orientation gives better results as compared with other orientations. Nusselt number determined as a function of Rayleigh number at Prandtl number approximately equal to (0.7) for all tests, Rayleigh number in this study ranges between $(1.877 \times 10^3 \leq Ra \leq 8.086 \times 10^3)$. From the results the heat transfer coefficients of the heated plate in sideward orientation are about (8%) greater than those for the upward orientation and exceeds that of downward facing by (24%). Also the orientation effected in the distribution of temperature along the fins. The results shows that the temperatures along the fins in sideward state have an uniform distribution, while in upward orientation the temperature along the fins increased in location nears the base plate, this behavior becomes very clear in downward orientation because of the impeding in moving hot air.