

Dynamical and Thermal Study of Twin Impinging Jets a Vertical Plate with Various Jet Velocities and Impinging Distance

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Abstract : This investigation proposes a numerical analysis of two turbulent parallel jets impinging a heated plate. The heat transfer enhancement is carried out according of the main parameters of the jet-wall interaction. The numerical solution of the stationary equations (RANS) is performed by the finite volume method using the k - ϵ model. A parametric study is performed to evaluate simultaneously the effect of nozzle-plate distance and velocity ratios in the range $0 \leq \lambda \leq 1$. It is found that good local cooling is obtained for $\lambda = 0.25$ when the impinging distance is between $4w$ and $8w$ than for velocity ratios $\lambda = 1$ and $\lambda = 0.75$. On the other hand, for impinging distances exceeding $8w$, the velocity ratio $\lambda = 0.75$ is more appropriate for good local cooling of the plate.

Keywords : two unequal jets, turbulence, mixing, heat transfer, CFD

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