Scopus

Documents

Menni, Y., Chamkha, A.J., Zidani, C., Benyoucef, B.

Heat Transfer in Air Flow Past a Bottom Channel Wall- Attached Diamond-Shaped Baffle - Using a CFD Technique
(2019) *Periodica Polytechnica Mechanical Engineering*, 63 (2), pp. 100-112. Cited 1 time.

Abstract
A computational analysis has been conducted to investigate turbulent flow and convective thermal transfer characteristics in a twodimensional horizontal rectangular section channel with a hot lower wall-mounted diamond-shaped baffle. The calculations are based on the finite volume method, by means of Commercial Computational Fluid Dynamics software FLUENT, standard k-epsilon turbulence model with QUICK numerical scheme, and the SIMPLE discretization algorithm has been applied. The fluid flow and heat transfer characteristics, i.e., dynamic pressure coefficient, stream function, mean, axial, and transverse velocities, turbulent viscosity, temperature field, skin friction coefficients, local and average Nusselt numbers, and thermal enhancement factor are presented for flow Reynolds numbers based on the aeraulic diameter of the computational domain ranging from 12,000 to 32,000 at constant surface temperature condition along the upper and lower walls. Effect of the diamond configuration of the insulated baffle is studied numerically and the data obtained from this same baffle model are also compared with that of the simple flat rectangular baffle under similar operating conditions. Over the range under investigation, the improvements are found to be around 3.962 and 29.820 times higher than the smooth air channel with no baffle for heat thermal transfer and skin friction factor, respectively. The maximum TEF is around 1.292 at the highest Reynolds number value, Re = 32,000.

2-s2.0-85065313846
Document Type: Article
Publication Stage: Final
Source: Scopus
Access Type: Open Access