

عنوان مقاله:

Thermoeconomic Optimization and Improvement in Effectiveness of Plate Fin Heat Exchanger with Similar (SF) Compared with Different (DF) Fin for Various Cold and Hot Mass Flow Rate

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خلاصه مقاله:

Thermoeconomic optimization of plate fin heat exchanger with similar (SF) and different (DF) or non-similar fin in each side are presented in this work. For this purpose, both heat exchanger effectiveness and total annual cost (TAC) are optimized simultaneously using multi-objective particle swarm optimization algorithm. The above procedure are performed for various mass flow rate in each side. The optimum results reveal that no thermoeconomic improvement is observed in the case of same mass flow rate in each side while both effectiveness and TAC are improved in the case of different mass flow rate. For example, effectiveness and TAC are improved 0.95% and 10.17% respectively, for the DF compared with SF. In fact, the fin configuration should be selected more compact in a side with lower mass flow rate compared with the other side in the thermoeconomic viewpoint. Furthermore, for the thermodynamic optimization viewpoint both SF and DF have the same optimum result while for the economic (or thermoeconomic) optimization viewpoint, the significant decrease in TAC is accessible in the case of DF compared with SF

کلمات کلیدی:

Plate fin heat exchanger; Effectiveness; Total annual cost; Thermoeconomic optimization; Similar fin; Different fin

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