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Artificial Neural Modeling of the Heat Transfer in an Air Cooled Heat Exchanger Equipped with Butterfly Inserts

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Abstract

The present study is conducted in order to demonstrate the capability of the artificial neural network (ANN) in predicting the heat transfer in an air-cooled heat exchanger equipped with butterfly inserts. The effects of the inclined angle of the inserts (q) and Reynolds number (Re) variation on average heat transfer in the air cooler are considered via this prediction. The training data for optimizing the ANN structure is based on available experimental data. The Levenberg-Marquardt back propagation algorithm is used for ANN training. The proposed ANN is developed using MATLAB functions. For the best ANN structure obtained in this investigation, the mean relative errors of 0.109% and 0.509%were reached for the training and test data respectively. The results show that predicted values are very close to experimental ones.