

Thesis Title	Experimental Study of the Performance of Wavy Fin-and-Tube Heat Exchangers
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Abstract

The effect of fin pitch, number of tube rows and fin thickness on the air-side performance of fin-and-tube heat exchangers are presented in the present study. The fin-and-tube heat exchangers used in this study are cross-flow type having wavy fin geometry. Air flows outside and hot water flows inside copper tube with 9.53 mm outside diameter and 0.3 mm thick. The fins of heat exchanger are made of aluminium. A total of 6 samples of wavy fin-and-tube, including 0.115 and 0.250 mm of fins thickness, 2-6 of number of tube rows and 1.41-1.81 mm of fin pitch are tested. The heat exchangers are tested in the open circuit wind tunnel. The experimental procedures are conducted by setting the hot water flowing inside the heat exchanger tube at a specific value and varying the air velocity. The results of heat transfer performance are presented as Colburn factor and the results of air-flow performance are presented as friction factor. The experimental data illustrate, that the effect of fin pitch on the air-side heat transfer performance are insignificant, the heat transfer performance decreases with increasing the number of tube rows and slightly increases with increasing fin thickness. The friction factor decreases with decreasing fin pitch and increasing fin thickness and the number of tube rows. Correlations of Colburn factor and friction factor are developed for practical use. The proposed Colburn factor correlation and friction factor correlation deviate from measured data in the range of ± 10 percent and ± 20 percent, respectively.