

Thesis Title	Performance of Plate Finned Tube Cooling Coil Under Dehumidifying Conditions
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Abstract

Refrigerant is typically used as a heat transfer media in cooling coil applications which its outside surface temperature is below the dew point of refrigerant. As the result, the air moisture is condensed and forms a thin film on the outside surface of cooling coil which is caused from exchange in heat between the refrigerant in the system and air in the surrounding, and drop in pressure of the refrigerant. In this study, Plate finned tube cooling coil is studied. It is made of copper tube which has 9.53 mm long in outside diameter , 0.762 mm thick and two-row tubes configuration. The fins of cooling coil are made of aluminium which have 0.115 mm thick and 14 fins per inch. In the experiment, it can be seen that the degree of heat transfer is influenced by the plate finned tube of cooling coil under the dehumidifying condition. In addition, a type of fin, the wet type and the dry one which play a significant effect to the degree of heat transfer are observed. The study has been further carried out by varying the inlet of air moisture temperature, the inlet of cold water temperature, the flow rate of cold water, the inlet relative humidity by using Colburn factor (j) to present heat transfer capability and using friction factor (f) to present flow capability of air moisture.

The experimental result and value in correlation of McQuiston and Wang are compared. The result shows that Colburn factor found in the experiment is lower than McQuiston and Wang's, whereas the friction remains constant. In terms of the correlation of

heat transfer coefficient, it deviated from experimental result in the range of ± 25 percent from the McQuiston and Wang's and the correlation of the pressure drop is deviated from experimental result in the range of ± 10 percent.

Keywords : Cooling Coil / Heat Transfer Coefficient / Pressure Drop / Dry Fin / Wet Fin