ABSTRACT

An attempt is made in this study to analyze complex configurations of cross flow heat exchangers. There are 3 objectives to be achieved in this study. Firstly, in order to obtain effectiveness value for complex configurations of cross flow heat exchangers, general methods for solving simultaneous equations by using MATLAB software will be developed. Secondly, this study aims to perform analysis for chosen heat exchanger configurations. Lastly, the result will be validated by using comparison analysis with well–established EVAP COND software. For co-flow, counter flow and simple cross flow arrangement, the value of effectiveness is given in the literature. Meanwhile, for more complex cross-flow heat exchanger, it is difficult to solve for the value of effectiveness since it involve simultaneous equations. The equations must be solved for each individual layout and cannot be generalized for all configurations. Therefore effectiveness for various complex configurations is yet to be published in any literature. A finned tube evaporator model is used by using EVAPCOND software. The modelling scheme is "tube-by-tube" and allows for specification of complex refrigerant circuits. It capability was to simulate refrigerant distribution in the refrigerant circuit. Simulation models that account for refrigerant circuit architecture are better equipped for accurately predicting heat exchanger performance. This is because the refrigerant path (co flow, cross flow, cross counter flow and cross co flow) through the heat exchanger can have a significant effect on heat exchanger performance. Several complex air finned coil heat exchangers has been analysed by using Chain Rule method in finding the value of effectiveness.