

# INVESTIGATION OF THE UNIT CELL CONCEPT FOR AIR-TO-LIQUID HEAT EXCHANGER RESEARCH AND DEVELOPMENT

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## ABSTRACT

This study investigated the validity of the Unit Cell concept to explore the performance of air-to-liquid heat exchangers. The Unit Cell concept will test only a 15.24 cm by 15.24 cm portion of a full sized prototype coil, to predict airside and heat transfer performance. This reduction in prototype size will allow for reduced costs and time for researching and development of heat exchangers. To validate a working model of the Unit Cell concept, a testing apparatus and procedure has been developed to test the small sized coils. Tests have shown that pressure drop across the Unit Cell coil can be matched within 6.27% and overall heat transfer can be matched within 6.37% of the full sized standard coil. By matching the available standard sized coil results, the Unit Cell concept has been confirmed and will provide a basis for improving heat exchanger testing.