

Abstract Submitted
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Experimental study on condensation heat transfer inside a single vertical tube¹ JORGE KURITA, AMITABH NARAIN, MICHAEL KIVISALU, Michigan Technological University — In this paper, results from a new computational model for condensation inside vertical cylindrical tubes have been compared to test data for FC-72 obtained in an actively controlled flow loop. This correlation was developed taking in account thermo physical properties of the 9 most common refrigerants. The present paper reports heat transfer coefficient, length of full condensation, vapor quality and direct measurement of the saturation and wall temperatures during condensation within a single cylindrical tube of 6.6 mm diameter and 700 mm length. The new model has been tested over the following range of experimental conditions: mass flux from 2.9 to 87.7 kg/(m²s), vapor qualities from 0.33 to 0.64 and full condensation. The saturation minus wall temperature difference was varied from 5 to 45 C. This model predicts heat transfer coefficients to within 15 percent accuracy over 70 percent of data points and predicts within 30 percent accuracy over 87 percent of data points in full and partial condensation cases respectively.

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