

An Experimental Study on the Evaporative Heat Transfer Enhancement for R410A with Pulsating Effect in Horizontal Smooth and Micro-Fin Tubes

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There have been several studies for heat transfer enhancement using various methods such as micro-fin tubes. In this study, evaporative heat transfer enhancement for R410A in horizontal smooth and micro-fin tubes is investigated under pulsating flow conditions with various frequencies and amplitudes. Smooth and micro-fin tubes with outer diameters of 5 mm and length of 1.44 m were selected as test tubes. The tests were conducted at mass flow rates of 1.4, 4, and 6 g/s, saturation temperature of -5 and heat flux of 20 kW/m². The pulsating conditions were varied from 1 to 8 Hz in frequency, as well as 1 mm and 2 mm in amplitude. The pulsation definitely contributed to the heat transfer enhancement for most test conditions, and this method can be used to save energy.