

0-212.5 วัตต์ในช่วงอุณหภูมิประมาณ 60-90 องศาเซลเซียส และมีค่าเพิ่มมากขึ้นเป็น 2156.8-3232.0 วัตต์ ในช่วงอุณหภูมิประมาณ 97-103 องศาเซลเซียส
และผลของตัวเลขเวเบอร์ที่มีต่ออัตราการถ่ายเทความร้อนของท่อความร้อนแบบสั้นที่มุมการทำงาน 90 องศา มีความสัมพันธ์ดังสมการ

$$Q_{90} = 64.56We^{0.58} \quad 14.87 < We < 1027.27$$

โดยมีค่าสัมประสิทธิ์การตัดสินใจ (R^2) เท่ากับ 0.99

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Thesis Title	Performance Analysis of Pulsating Heat Pipe Modified from Automobile Air-conditioning Condenser
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ABSTRACT

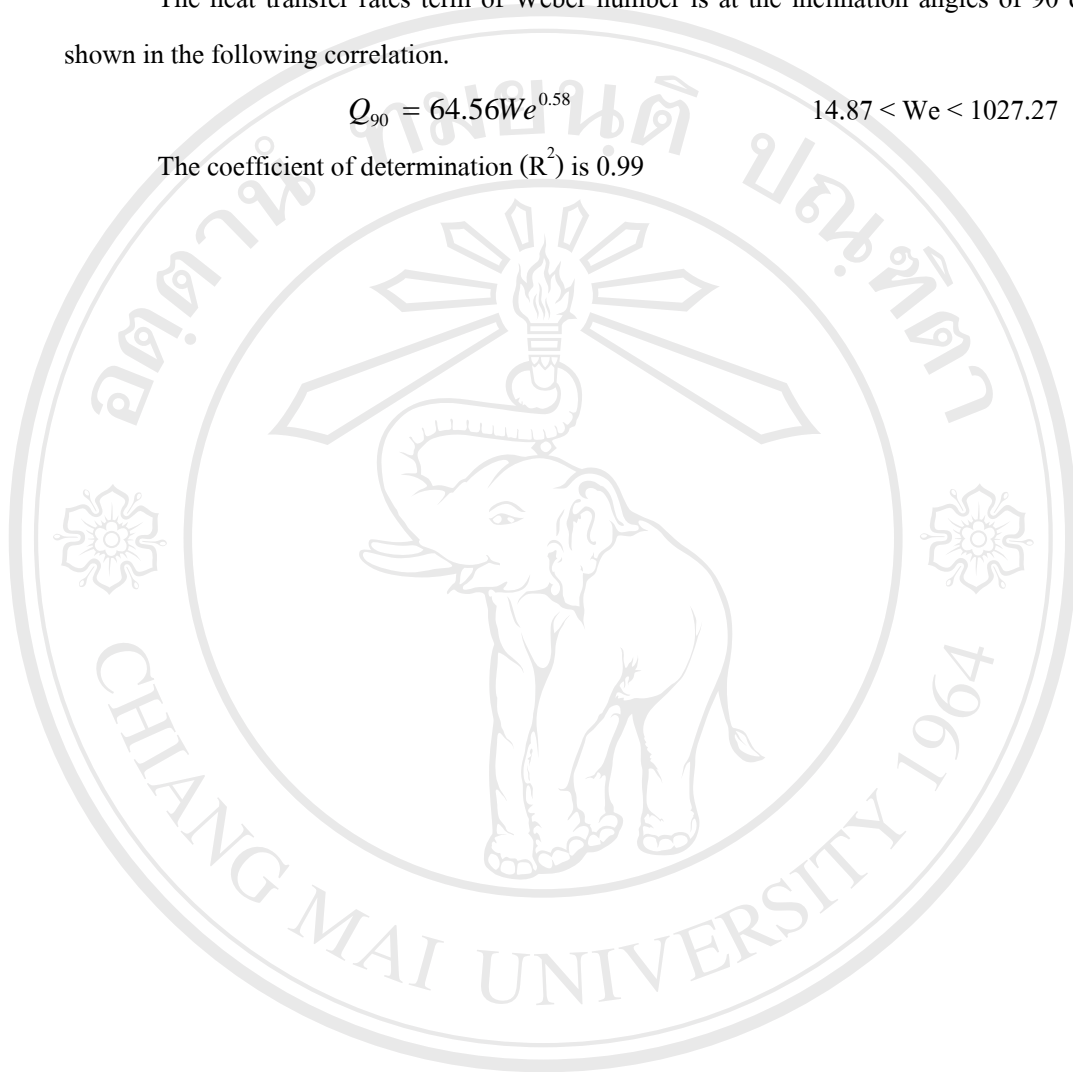
This research work is to study thermal performance of a pulsating heat pipe modified from automobile air-conditioning condenser. Water and acetone are working fluids used in the experiments. The condenser has dimensions of 0.022 m width, 0.635 m length and 0.005 m thickness. The fin has 0.016 m height. The evaporating, the adiabatic and the condensing sections are 0.225, 0.125 and 0.225 m, respectively. Hot air is used to generate heat at the evaporating section. The experiments are carried out at the unit inclination of 90 and -90 degree from horizontal level. The data of air velocities, inlet and outlet air temperatures at the evaporating and the condensing sections are recorded for calculating the heat rates. The inlet air temperature at the evaporating section is controlled at 60, 70, 80, 90 and 100 °C and the air velocity is set at 0.8, 1.0, 1.4 and 1.7 m/s.

From the experiments, it is found that the thermal performance of the heat exchanger varies with the source temperature and the inclination angle. For water the evaporating is the lower part, the heat rate obtain is 44.3-602.1 W, and when the evaporating is the upper part, the heat rate is 60.7-279.6 W. For acetone, the heat rates are 333.3-3279.4 W and 0-212.5 W, respectively. In the case of acetone, when the evaporating section is the upper part, at the heat source temperature 97-103 °C, the heat rate could be up to 2158.6-3232.0 W compared with 0-212.5 W for 60-90 °C.

The heat transfer rates term of Weber number is at the inclination angles of 90 degree are shown in the following correlation.

$$Q_{90} = 64.56We^{0.58} \quad 14.87 < We < 1027.27$$

The coefficient of determination (R^2) is 0.99



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