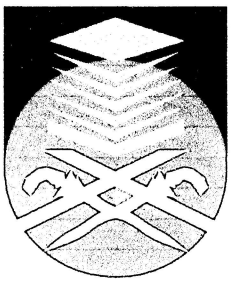

EXPERIMENTAL INVESTIGATION ON HEAT PIPES AS EFFICIENT HEAT TRANSFER DEVICE

MOHD. HARISUDDIN BIN KUSNI

(2006689611)

A thesis submitted in partial fulfillment of the requirements for the award of Bachelor Engineering (Hons) (Mechanical)

Faculty of Mechanical Engineering

Universiti Teknologi MARA (UiTM)

MAY 2010

"I declared that this thesis is the result of my own work except the ideas and summaries which I clarified their sources. The thesis has not been accepted for any and it is not concurrently submitted in candidature of any degree"

Signed :.....

Date :17/05/2010.....

Mohd. Harisuddin Bin Kusni

UiTM ID: 2006689611

ACKNOWLEDGEMENT

First of all, I would like to express my deepest grateful to Allah S.W.T. for giving me the strength and confidence to complete this project successfully.

During completing this project that entitled "Experimental Investigation on Heat Pipes as Efficient Heat Transfer Device", there are lots of people that contribute to the accomplishment of this project. I would like to express my gratitude and appreciation to my project supervisor, Mr Baljit Singh a/l Bhathal Singh for his undivided time, supervision, knowledgeable advices, and continuous guidance throughout the completing of this project. Without his support and encouragement, it would be impossible for us to succeed in the completion of this project.

I would also like to express a huge appreciation to En Mohd Fadhli and En Mohd Faizazairi from Thermofluid Laboratory for guiding and assist me during conducting the experiments at the laboratory.

My huge appreciation also directed to my friends for helping and sharing some knowledge in completing this project.

I would also like to express a huge appreciation to my loving family for their unconditional love, faith, devotion, time, and financial assistance. They have taught me the meaning of discipline and the important of never giving up.

Lastly, I would like to express my gratitude to those who have directly or indirectly helped me towards the achievement of this project.

Thank You.

ABSTRACT

An experimental study of heat transfer performance in varying angle heat pipe is carried out in this project. The heat pipe is designed to work in a closed evaporator-condenser system. The basic heat pipe differs from the thermosyphon in that a wick, constructed from a few layers of fine gauze. A vessel of heat pipe in its inner walls is lined with the wick structure. The heat pipe consists of a tube shell, wick structure and a working fluid. It has the ability to transport heat of working fluid through the hollow core by capillary action. The efficiency of heat pipe is related to the working fluid and its properties. Two copper heat pipes with the length of 0.35m have been fabricated in order to study the effect of performance by varying the orientation angles of heat pipe. One of the heat pipes functioned as thermosyphon and the other one have carbon fibre as wick material. Distilled water is used as the working fluid because of its cleanliness and free from microscopic contaminants. The thermal behavior of two vacuumed heat pipes which contain wick and without wick has been studied experimentally and analyzed. A comparison of temperature distribution at the outer wall of two heat pipes has been made for the angle of 0°, 10°, 20°, 30°, 60° and 90°. From the experiment, the data of the heat pipes such as heat supplied and heat dissipated are measured and collected. The efficiencies of two heat pipes are calculated.

TABLE OF CONTENTS