THE DESIGN OF SOLAR HOT WATER SYSTEM USING RECYCLE ITEM

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"I declare that the content present in this thesis are my own work which was done at Universiti Teknologi MARA (UiTM) unless stated otherwise. The thesis has not been previously submitted for any other degree."

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Bismillahirrahmanirrahim,

In the name of Allah, the Beneficient, the Merciful.

ABSTRACT

This study introduce a design of low cost solar hot water system using (SHWS) recycle item and subsequently to investigate its thermal performance. The SHWS works by utilizing the thermosyphon principle, where with the effect of small density difference of the air that will driving the force and create a circulation to the system. In other words, hot air always floats on cold air and flows to the heat exchanger tank from the vacuum tubes. The main attraction of using SHWS is to reduce the monthly energy bills and it is environmental friendly technology. The drawback of SHWS is the price and maintenance cost is not affordable for the middle class and lower income community. Hence, an inexpensive of SHWS made from recycle item is proposed. To fulfill the main objective of this research there are some stage that need to be done. It's including by collecting the information and some related formula and theory about the principle that involve about Solar Hot Water System based on the pervious journal and books. The numerical simulation and designing phase were carried out to predict the outlet water temperature using Solidwork 2015 and analyze the performance and efficiency of solar hot water system theoretically. The research shows the effect of different operating parameters, outlet and inlet water temperature, ambient temperature, mass flow rate on the inlet water temperature and thermal efficiency in the closed loop system. It is observed that the thermal efficiency of the solar water heating system increases with ambient temperature, and with decreases of mass flow rate of water. However, thermal efficiency decreases as inlet water temperature increases. The performance of the proposed SHWS has been tested and able to provide hot water between 38 – 42 ºC.

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