



## **SOLAR COOLER**

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

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## **ABSTRACT**

One most common technology that contributes to high power consumption is the usage of air conditioner to achieve thermal comfort. The usage of high power consumption technologies increases the electricity power demands of a country. The main objective of this study is to design and fabricate an alternative cooling system using sustainable energy source taking advantage of plants as a cooling medium. This thermal comfort device is able to reduce the air temperature to the comfort level and reduce the electricity usage by using solar evaporative air cooler. The cooler body was designed using Solidworks software and was fabricated where it was put to experimental testing. Plants were used in the project to undergo transpiration, which is a natural process where moisture is carried from the roots to the underside of the leave to be evaporated to vapour to decrease the temperature of the plants surrounding. For this project, Heron's fountain technique is applied to reduce the overhead created by electricity pump and reduced the power consumption of the water pump by lifting up water using gravity. The results show that power consumption is reduced by only using around 23 watts per hour when applying the siphon system and Heron's fountain into the water circulation system. As for the cooling system, the used of plant as a cooling medium can reduce the air temperature around 2°C depending on the surrounding condition to achieve the range of thermal comfort of 25°C to 29°C for a 90 square feet single bedroom of a residential building. Therefore, we can conclude that solar cooler shows potential in replacing air conditioner as the main choice to achieve thermal comfort.

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