



**THE DEVELOPMENT ON HEAT AND EFFICIENCY
CHARACTERIZATION OF QUINTUPLET
EXPOSURE BOX-TYPE SOLAR COOKER**

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"I declared that this is the result of my work except 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

Solar cookers or solar ovens are devices which use sunlight as its energy source. They are primarily used to cook food and heating water. Solar cookers are a form of outdoor cooking, and are often used in situations where minimum fuel consumption or fire risk is considered highly important. The simplest type of solar cooker is a box-typed, where it is the easiest and most popular to build and use. So, a Quintuplet Box-Typed Solar Cooker is being researched with the objectives to determine its heat energy that can be stored, efficiency and suitability to be used in Malaysia's climate. The solar cooker is made from glass and supported by a trolley to improve testing transportability. Two major experiments were held which are single and double-layered solar cooker, where each of them consist, of three minor tests for empty, hydro and food testing. That brings a total of six experiments. This solar cooker is tested for one month using XR440 Pocket Logger that acted as sensors to measure the inside temperatures and humidity for every 15 minutes, and the data collected will be represented in temperature table and tabulated temperature graph. The data obtained were used to measure heat energy storage and efficiency of solar cooker in each testing. In comparison, double-layered solar cooker can store better heat energy and efficiency than single-layered since it operates as collector that collects more heat inside the solar cooker. Hotter climate also gives higher efficiency to solar cookers. Malaysia's sunlight is satisfactory for Quintuplet Exposure Box-Type Solar Cooker. Since Malaysia located in equatorial area, solar thermal applications should be applicable, so other types of solar cooker can be researched.

Keywords: Solar, quintuplet box-type, heat transfer, efficiency, Malaysia, XR440 Pocket Logger, temperature, equatorial.

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