DESIGN OF SOLAR ENERGY WATER HEATER, 
SINUSOIDA TYPE WAVE ABSORBER

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Abstract

Utilization of solar energy by using solar collectors have been much studied in the context of alternative energy sources due to the availability of fossil energy dwindling. One way of optimization of solar collector is the absorber plate with the replacement of conventional forms of flat-plate absorber to absorber plate waves. The purpose of modification is expected to have the effect of heat transfer due to greater heat transfer surface area is greater.

Working fluid flows through the bottom of the zinc wave, so that the flat plates required to cover the bottom of the zinc wave. Solar water heating collector is composed of several components including the cover glass, the wave absorber plate, insulation. Experiments using a variation of the flow 300 cc / marry up to 700 cc / min with an increase in 100 cc / min per change in flow variation. It aims to determine the effect of fluid flow variations to the intensity of the sun, the solar collector efficiency and outlet temperature. Data acquisition began at 07.00 - 16.00. Every one hour of data acquisition is the fluid temperature inside, the fluid out, absorber plate, cover glass, and high intensity of the sun. Wave plate is used having a wave angle and angle of 129 ° 20 ° collector. Research conducted at the Heat Transfer Laboratory
Department of Mechanical Engineering Faculty of Industrial Technology Institute of Surabaya indicate a better match.

From this research and analysis of the results obtained the efficiency of the collector changes, overall heat transfer, temperature distribution of absorber plate, useful heat energy (Qu) and working fluid outlet temperature. The highest efficiency value obtained in the flow jam12.00 with the registration 700cc/menit for 59.4%.

Keywords: solar collector, a wave absorber, the total heat transfer coefficient, a useful energy, the efficiency of the collector.