PERFORMANCE TEST OF HEXAGONAL SOLAR COOKERS WITH VARIATION OF ABSORBER MATERIALS (ALUMUNIUM, COPPER, BRASS)

Rizky Aditya
Renewable Energy Engineering of Study Program
Department of Engineering

ABSTRACT

The hexagon type solar cooker with a variety of absorber material has the same cooking space size of 18 cm x 23.5 cm with a total area of 3736.5 cm². Variations of the absorber material used are brass, aluminum and copper with a thickness of 0.02 mm, the selection of the absorber material is based on the conductivity of the material. The test was carried out on the rooftop of the building and the parking area, Jember State Polytechnic Engineering Building. Testing at each place uses 3 days of testing starting at 10.00-14.00 WIB. The highest water temperature was found in the second test under aluminum absorber material with the highest temperature at 13.30 at 93.75° C. For the highest efficiency of the solar cooker was found in the solar cooker with brass absorber material at first test test at 13.30 with an efficiency value of 70.90 %. The efficiency value is influenced by the difference in the initial temperature of the water and the end of the water, the solar irradiation received by the solar stove and the length of the cooking process. The highest total heat transfer was found in the solar cooker with copper absorber under third test with a total heat transfer value of 91,58 kW. The value of the heat transfer rate is influenced by the high thermal conductivity of the copper absorber material so that the heat transfer rate is also higher.

Keywords : Hexagonal solar cooker, absorber, efficiency, heat transfer