Manufacturing and Testing of Parabolic Solar Cooker Type With The Addition of A Fresnel Lens Concentrator

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ABSTRACT

Parabolic type solar cooker with a diameter of 166 cm and a height of 40 cm and aluminum foil as the absorber material. Testing the parabolic type solar cooker using the addition of a fresnel lens concentrator with variations in the angle of the fresnel lens. The size of the fresnel used in this study was 30 x 30 cm with a lens thickness of 5 mm. The variation of the angle of the lens using an angle of 30^0,$45^0$and 60^0.The test was carried out for 9 days, starting at 09.00 - 14.00 WIB or for 300 minutes of data collection including water temperature, absorber temperature, pan temperature, ambient temperature, wind speed and intensity of solar radiation. The water temperature was highest on the third day 71.6 ^{0}C occurred at 12:50 pm with the variation of the angle of the lens 30^0.The cooking power produced is 12.59 W with an average cooking power of 10.52 W on that day, so that the efficiency of the stove is 5.83%. The value of efficiency is influenced by the intensity of solar radiation received by the stove, the difference in the initial and final temperatures of the water, and the length of the cooking process.

Keywords: Parabolic Solar Cooker, Fresnel Lens, Variation of Lens Tilt Angle