

Optimization of the UB-03 Biomass Stove Using the Response Surface Methodology (RSM) with the Addition of a Reflector

Dr. Bayu Rudiyanto, ST., M.Si (Minithesis Counselor)

Riska Triya Imam Yulanda

Study Program of Renewable Energy Engineering
Department of Engineering

ABSTRACT

Biomass stove is a stove whose fuel system uses biomass fuel to produce heat through combustion for use in domestic cooking processes or other design purposes tailored to user needs. Increasing the efficiency of the biomass stove can be done by adding a reflector to the UB-03 biomass stove in this study. The reflector also functions as a fire concentrator and captures heat lost to the environment. The method used for testing in this study is the Water Boiling Test (WBT) method and the analytical method used is the response surface method. This study aims to determine the optimization response of a biomass stove with the addition of a reflector with the response surface method. The experimental design used in the response surface method is BBD (Box Behnken Design) with 3 factors, namely angles (64° , 65° , and 66°), number of holes (9, 10, and 11), and hole diameter (0.8 cm, 1 cm, and 1.2 cm). The optimization results obtained in the efficiency response analysis are maximum optimization at an angle of 66° with a number of holes 10 and a diameter of 0.8 cm resulting in an optimum response of 18.67%.

Keywords: Biomass Stove, reflector, response surface methodology, BBD, optimization