

ABSTRACT

In general, people use energy from various sector, such as household, transportation, and large and small industries. Currently, the largest energy use in Indonesia still using non-renewable energy sources, that is oil fuel with a percentage of 41,4%. This leads to shortages in non-renewable energy sources. The alternative solution that offered to utilize other energy sources in the household sector is the use of biomass as a fuel. The use of coconut shells was chosen because of its abundant availability and can increase the use value of coconut shells that can not be fully utilized by the community as a fuel. The right way is to convert biomass fuel using biomass gasification stove. The gasification stove that used in this study is the downdraft gasifier with variations in the number of holes in the gasifier, it is 20, 25, 30, 35, and 40 holes. The testing of the downdraft-type gasification stove by varying the number of holes in the gasifier is expected to improve the performance of the gasification stove with the data collecting method using the Standar Nasional Indonesia (SNI) procedure for Biomass Furnace 7926:2013. From the test that conducted, it was found that the best thermal efficiency and fuel consumption rates were found at the 20-holes type at 14,21% and 0,74 kg/hour.

Keywords: biomass, gasification stove, *downdraft*, Standar Nasional Indonesia (SNI), coconut shells