

ABSTRACT

Alternative energy sources from forestry and agricultural processing waste has abundant potential, this can be reduce people's dependence on fossil fuels such as kerosene and natural gas (LPG). Society dependency on fossil fuels is still macro, causing limited availability and tends to decrease. Therefore, it requires handles in the use of alternative energy sources such as energy sources derived from biomass. One of the technologies is applied to the stove using the Top-Lit Updraft gasification technique. This research aims to determine the performance of gasification stoves from variations in biomass type and velocity of air flow in the reactor. The testing of biomass gasification stoves was carried out according to the SNI Furnace Biomass 7.926 procedure in 2013. Each test carried out using three variations of biomassa types, namely: rice husk *wood pellets*, teak *wood pellets* and sengon *wood pellets*. The test method uses six variations of the primary air flow velocity, namely: 1.1 m / s; 2.5 m / s; 3.5 m / s; 4.5 m / s; 5 m / s and 5.4 m / s. Result the testing of biomass gasification stoves with rice husk pellet wood has the fastest operating time of the stove with an air flow rate of 5.4 m / s, a fuel mass of 0.3 kg with a stove operating time of 10.46 minutes. Pellet rice husk wood fuel used to boil one liter of water takes 5.56 minutes, with the reactor temperature (flame temperature) of 295.4 ° C. The highest thermal efficiency value in rice husk pellet wood fuel is 47.65%.

Keywords: biomass stove; T-LUD; *wood pellets*.