

ABSTRACT

People's dependence on fossil-based fuels such as kerosene and natural gas (LPG) is still high. Therefore, the utilization of rice husk biomass as an alternative energy can be applied to the stove with biomass gasification techniques. Rice husks are chosen because of the abundant availability and low water content compared to other biomass. The biomass stove used in this research uses the concept of Top Lit Up Draft (T-LUD) Gasifier. Biomass stoves were tested by comparing two gasifiers having a height of 20 cm and 30 cm. Each gasifier is given three variations of the number of air holes and eight variations of the primary air velocity (0.5 m/s; 1 m/s; 1.5 m/s, 2 m/s; 2.5 m/s; 3 m/s; 3.5 m/s; 4 m/s). Biomass stove testing is done according to Water Boiling Test (WBT) and SNI Biomass Furnace 7926: 2013. From the test of biomass stove that has been done, the longest operation time is 11.52 minutes happened at gasifier 20 cm at speed 1.5 m/s with side airside treatment closed partially. The highest thermal efficiency value is 93.59 % for gasifier 20 cm and 91.68 % for 30 cm gasifier.

Keywords: *rice husk; biomass stove; T-LUD; WBT; SNI Gasifier.*