

Design and Performance Test of Integrated Burner Gasification Furnace with Toplit Updraft Type with Variation of Air Flow Velocity

Tarbiyatul Umamul Am
Renewable Energy Engineering Study Program
Engineering Department

ABSTRACT

This study aims to design the integrated biomass burner gasification furnace type toplit updraft with variations in air flow. Selection of the toplit updraft type aims to maximize the combustion process on sengon wood fuel. The airflow used is 1 m/s, 2 m/s, and 3 m/s. Research parameters include fuel consumption, combustion rate, cooking time, and efficiency. The results obtained by using the WBT (Water Boiling Test) method, the highest cooking speed, fuel consumption and combustion rate were obtained at an air flow of 3 m/s, 2 liters of water boiled in the 3rd minute, but the resulting efficiency was only 5,44 %. At 1 m/s air flow the resulting efficiency is greater, namely 8,08%, but the time for boiling water is longer, namely in the 5th minute. Compared to a traditional stove, the highest efficiency is 6,64 % and the time to boil water is 12 minutes.

Keywords: Furnace design, Gasification, Air flow, Efficiency