

Uji karakteristik gas burner dari sistem gasifikasi biomassa menggunakan fixed bed downdraft gasifier = Study of gas burner characteristic of biomass gasification system using fixed bed downdraft gasifier

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Abstrak

Biomass gasification is a process to convert biomass to be a combustible gas. That combustible gas named syngas later will be mixed with air or oxidator inside the gas burner to get appropriate mixing or air and fuel then could be produce optimum flame after being ignited. Gas burner that could mix the fuel and the air appropriately needed to get the optimum flame. Swirl vane is a part of gas burner that has a function to make a perfect mixing of air and fuel. The problem is the optimum number of swirl vane on gas burner still unknown. Experiment of three kinds of gas burner with different number of swirl vane; six, eight, and ten swirl vanes done in this thesis with an objective to find out the most optimum number of swirl vane on gas burner.

The results of experiment on variation of swirl vane number on gas burner is gas burner with 8 swirl vanes has the highest average flame temperature (795°C), also the highest heat release rate (11,15 kJ/s). Higher the flame temperature result in higher heat release rate. Combustion efficiency on gas burner with 8 swirl vanes is the best with 85,5%, then gas burner with 10 swirl vanes with 85,1%, and the last gas burner with 6 swirl vanes with 83,1%. Those result indicate that gas burner with 8 swirl vanes could make the best internal recirculation zone (IRZ) so that the mixing of air and fuel in the gas burner with 8 swirl vanes becomes more perfect than the other gas burner result in the most perfect combustion process.