**ABSTRACT**

**DESIGN, MANUFACTURING, AND TESTING**

***INTEGRATED GAS CLEANING SYSTEM* (IGCS)**

**AS THE PRODUCER GAS PURIFICATION**

**By**

**CANDRA ADITIA AGUSTIAN**

Gasification gas product is a gas combustible gas such as CO, H2, methane, Inorganic impurities like NH3 HCN, H2S, fly ash and organic impurities which called tar. Producer gas from biomass gasification consists of tar from pyrolysis process which is not degradation thermal well before out from the reactor. Tar is a stick hydrocarbon, corrosive and the black is stick on it. The obstacle in processing of tar is complexity. If the gas used as a fuel of IC engine so, the producer gas particle contain should be less than 50 mg/Nm3 and themaximumtarcontentis100 mg*/*Nm3. Therefore, the producer gas should be processed to get the purpose.

The research purpose which is to design a purify device for the producer gas which is integrated and also to know the influence of gas speed and water debit towards tar getting as measurement research of IGCS. The research does by using reactor with diameter dimension 0,8 m and 1,5 m high.

The result of this research getting the gas speed for the cyclone about 2,4 m/s and flow of water in venturi scrubber 3,3 l/min, collected tar is 12 gram with 66,67 % cyclone efficiency and 10 gram with 44,44 % venturi scrubber efficiency. Meanwhile, rotary separator gas speed about 2,6 m/s, it is able to reduce 10 gram tar with 55,56 % efficiency. The result from combine testing show that the tar left in producer gas is only 210 mg/m3 with 94,4 % efficiency. The results of this experiment still not meet the requirement internal combustion engine standard.

Keywords: Biomass gasification, Gascleaning, IGCS, Tar.