

## SUMMARY

GALIH WICAKSONO, Department of Mechanical Engineering, Faculty of Engineering, Brawijaya University, January 2015, Effect of Mechanical Stirring and Preheating of a Mixture of  $\text{CH}_4$  -  $\text{CO}_2$  to the Diffusion Flames, Supervising Lecturer : Dr.Eng. Denny Widhiyanuriyawan, ST., MT. and Dr.Eng. Mega Nur Saso, ST., MT.

The use of fossil fuels which are constantly being led to a source of energy reserves the fossil depleting. Therefore we need an alternative energy. An example that is currently being developed biogas derived from waste and decay of organic waste .

In this research it can be determined what the high flame yellow and blue that is produced on a burner of the process of combustion in diffusion of a mixture of fuels with the percentage of  $\text{CH}_4$ , much as 55 % , 60 % , 65 % , 70 % , 75 % of and  $\text{CO}_2$  : 25%, 30%, 35%, 40%, 45% as well as variations of temperature heating the beginning of a mixture of fuel before being burned 27°C, 50°C, 75°C, 100°C. The visual data fire on a burner done with and without the addition of a mixer as mechanical stirrer gas a mixture of both gas before heated.

The result showed that the higher the percentage  $\text{CH}_4$ , and the small percentage of the  $\text{CO}_2$  on a mixture of fuel , then fire would come more produce a yellow color. With the additional mechanical early stirrer and preheating make high fire increased. A highest yellow flame can be seen in the use of a mixer with gas preheating temperature 100°C. Then, a highest blue flame can be seen in the use of a mixer with gas preheating temperature 50°C.

**Keywords:** Biogas,  $\text{CH}_4$ ,  $\text{CO}_2$ , gas mixer, heater, diffusion, flame