

## ABSTRACT

**Setyawan, A. et al**, 2010, Engineering of Unit Coal Wastes Processing And Their Utilization as Cement Replacemet on Manufacturing of Building Materials To Control Environmental Pollution, Competitive Grant 2<sup>nd</sup> Year.

Coal waste in solid waste from PT.Sritex causing a negative impact, because of SO<sub>x</sub> and NO<sub>x</sub> compounds in the form of gas into the air and react with water vapor to form H<sub>2</sub>SO<sub>4</sub> and HNO<sub>3</sub>, resulting acid rain harmful to the environment and health problems. The purpose of this study is to utilize waste coal becomes fly ash and bottom ash where the fly ash is used as an alternative material in the manufacture of cementitious paving block and cementitious brick to have the better physical and mechanical properties and the higher value.

Experimental method is applied to produce samples at the factory. Independent variables used in this study were: the composition of fly ash (20% and 40%); composition of sand: cement (8:0.75 and 10:1), time of mixture (4 minutes and 8 minutes). The dependent variable used is the compressive strength and porosity of the paving blocks and bricks. Data from testing the compressive strength and porosity were analyzed by Taguchi method to obtain the most optimal composition.

The result showed that the composition of fly ash, the composition of sand: cement; and stirring contribution to contribute to the compressive strength of paving blocks, each for 38,969%, 20,336% and 7361%. While the percent contribution of the compressive strength of concrete blocks, each for 49 976%, 7861%, and 15 169%. Percent contribution of each variable on the porosity of paving blocok is 33,379%, 14.76% and 23,275%. While the brick porosity of 35 567%, 9447% and 9:04%. Output in this study is the composition of material for paving blocks and bricks the optimum coal waste (fly ash). It is found that in order to obtain paving block and concrete brick quality in terms of compressive strength and porosity of the optimum, it can be done by varying the composition of 20% fly ash, sand composition: cement 8:0.75 and stirring 4 minutes.

Key words: fly ash, compressive strength, porosity, paving blocks, bricks, Taguchi