

## **ABSTRACT**

Research has been conducted on the analysis of the potential ash of residual combustion waste and lignocellulosic biomass waste (sugarcane stalks, corn stalks, rice stalks, and grass stalks) as a mixture of alternative biocomposite bricks. Biocomposite brick material used in the form of clay, ash from the combustion of waste, lignocellulose biomass with a ratio of 5:1:1 (m/m). Brick biocomposite was obtained after mixing the material, followed by two combustion processes, namely temperature of 35 °C, 110 °C for 24 hours, and finally sintering with a temperature of 600 °C for 30 minutes. The biocomposite brick analysis test is carried out based on the parameters of chemical property, physical property, and mechanical property. Chemical property data results show that biocomposite bricks do not contain dangerous salts, although hazardous compounds such as metals are found in the ash content of residual combustion waste. The physical property data in the form of density and porosity value indicate the biocomposite of a mixture of ash bricks from the residual combustion waste and sugar cane trunk (1.52 grams / cm<sup>3</sup> and 18%) has fulfilled SNI 15-2094-2000. These results are supported by SEM-EDX data which shows the biocomposite of a mixture of ash bricks from residual combustion waste and sugarcane stems has the smoothest surface structure. The shrinkage data states that all biocomposite bricks have a value < 8%. Then, the result of mechanical property data in the form of the highest compressive strength test value is shown by the mixture of biocomposite bricks from the residual combustion ash and sugarcane residue at 7.05 MPa. In general, based on these parameters, the ash from the burning of residential rubbish and lignocellulosic biomass waste has the potential to be an alternative mixture of biocomposite bricks that can be used for various types of buildings.

**Keywords - Ash, Biocomposite, Bricks, Lignocellulose Biomass**