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## ABSTRACT

Technological developments in the construction sector continue to increase. This is inseparable from the demands and needs of construction materials for increasingly advanced infrastructure, such as bridges with long and wide spans, other high-rise infrastructure buildings. Many countries use Ultra High Strength Concrete (UHSC), because this type of concrete has the advantage of high compressive strength. In the manufacturing process, Ultra High Strength Concrete requires cement that is quite high, so it will increase cement production, where cement production itself has a bad impact on the environment, because it can cause global warming. Because the process of making cement releases CO<sub>2</sub> gas from high temperature combustion. In order to reducing the adverse effects, Fly Ash is usually used as cement substitution to reduce the use of cement.

The purpose of this study was to determine the effect of Fly Ash on the mechanical properties of Ultra High Strength Concrete, namely to determine the effect of Fly Ash on workability, heat hydration, density, water absorption and compressive strength.

The compressive strength test results obtained a compressive strength value in the variation of the use of fly ash with a percentage of 0%, 5%, 10%, 15%, 20% at the age of 28 days with a value of 106.0 MPa, 111.5 MPa, 106.9 MPa, 102.8 MPa, 97.8 MPa. For the results of the heat hydration test results obtained 54.20oC, 53.53oC, 54.87oC, 48.75oC, 46.56oC. while the results obtained for gusto will increase by 10% using fly ash. As for the results of more density, the percentage of use of fly ash will be the lower the value of its density.

**Keyword :** *Ultra High Strength Concrete, Fly Ash, compressive strength, M sand.*