

ABSTRACT

The Effect of Adding Coconut Fiber On The Compressive Strength and Split Tensile Strength of Geopolymer Concrete

. This research aims to evaluate the impact of adding coconut fiber on the compressive and tensile strengths of geopolymer concrete. The study utilized geopolymer concrete composed of a mixture of fly ash and coconut coir fiber. The research variables included the percentage of coconut coir fiber in the geopolymer concrete mix, namely 0%, 0.25%, 0.50%, and 1%. Data collection involved the fabrication of geopolymer concrete, testing of coarse and fine aggregates, and aggregate sieve analysis. The results of this study are expected to provide insights into the potential of coconut fiber in enhancing the quality of geopolymer concrete. The analysis revealed that the addition of coconut fiber can increase the tensile strength of geopolymer concrete, with a peak enhancement of 32.52% observed at the optimal proportion of 0.5%. Conversely, at 1%, a decrease of 4.64% in tensile strength was noted. Furthermore, the compressive strength of geopolymer concrete experienced improvement up to a proportion of 0.5%, showing an increase of 48.79%. However, at 1%, the tensile strength decreased by 12.43%. Therefore, the 0.5% proportion of coconut fiber is considered optimal for enhancing both tensile and compressive strengths of geopolymer concrete. This research contributes to expanding the understanding of coconut fiber usage in geopolymer concrete and provides recommendations regarding the optimal proportion of coconut fiber in the geopolymer concrete mix.

Keywords: geopolymer concrete, coconut fiber, compressive strength, tensile strength, fly ash