

Studi Pemanfaatan Glasspowder Pada Karakteristik Mekanis dan Fisis Paving Blok Geopolimer

Muhammad Sofyan^{*1}; Amry Dasar²; Ade Okvianti Irlan³; Irma Wirantina K⁴; Rr Mekar
Ageng Kinasti⁵; Velizar Sujanes⁶; Aswar Amiruddin⁷

^{1,4,5,6}Prodi Teknik Sipil, FTIK, Institut Teknologi PLN, Energi

³Prodi Teknik Sipil, FTSP, Universitas Trisakti, Energi

⁷Prodi Teknik Sipil, FT, Universitas Borneo, Tarakan

Email Coresponding Author:

^{*1}liorente1688@gmail.com

Abstract

Fly 57ti t57 one of the pozzolanic materials derived from coal combustion. However, unlike Portland cement, fly ash does not have the capacity to bond. An activator solution, such as Portland cement, is required so that fly ash can have binding capability. Glass trash from industry and homes, in addition to fly ash, may be processed to be utilized as a material that can increase the performance of geopolymer materials since it contains considerable silica (SiO₂) and lime (CaO) components. Glass powder was utilized as a fly ash alternative in geopolymer paving blocks in percentages of 0%, 15%, 30%, 45%, and 60%. The compressive strength and water absorption of paving blocks were examined. When the material was 7 days old, the test was performed. The findings revealed that the best compressive strength was found in paving block geopolymer with 45% glass powder variation and 55% fly ash variation, namely 30.67 Mpa, which comprised paving block quality B. The lowest water absorption was reported in paving block geopolymer with 45% variation in glass powder. The paving blocks manufactured in this study were of B quality, according to SNI 03-0691-1996.

Keywords: Paving Block, Geopolymer, Glass Powder, Fly Ash.

Abstrak

Fly ash merupakan salah satu bahan pozzolan yang diperoleh dari limbah hasil pembakaran batu bara. Fly ash pada dasarnya tidak memiliki kemampuan mengikat seperti semen portland. Dibutuhkan larutan 57ti t57yme agar fly ash dapat memiliki daya ikat seperti semen portland. Selain fly ash, limbah kaca dari industri maupun rumah tangga dapat diolah untuk dapat dimanfaatkan sebagai material yang dapat memperbaiki kinerja bahan geopolimer karena mengandung senyawa silica (SiO₂) dan zat kapur (CaO) yang cukup signifikan. Penelitian berfokus pada glass powder yang digunakan sebagai substitusi fly ash pada paving blok 57ti t57ymer dengan persentase 0%, 15%, 30%, 45% dan 60%. Kinerja paving blok diuji berdasarkan kuat tekan dan penyerapan air. Pengujian dilakukan pada saat sampel berumur 7 hari. Hasil penelitian energi bahwa nilai kuat tekan optimum terdapat pada paving block geopolymer dengan variasi glass powder 45% dan fly ash 55% yaitu 30,67 Mpa yang termasuk paving block mutu B. Penyerapan air terendah terdapat pada paving block geopolymer variasi glass powder 45%, paving block yang dihasilkan pada penelitian ini adalah paving block dengan mutu B.

Kata kunci: Paving Block, Geopolimer, Glass Powder, Fly Ash.