ABSTRACT

THE EFFECT OF ADDING CORN COB ASH TO PHYSICAL AND MECHANICAL PROPERTIES OF MORTAR

BY

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The research was carried out about the effect of adding corn cob ash to physical and mechanical properties of mortar. Mortar was moulded with three compositions i.e. portland cement, corn cob ash and corn husk fiber. Corn cob ash was burned at temperature of 700 ^{o}C for 2 hours. Corn husk fiber was mechanically sliced up to 0.8 mm in size. Then, mortar molding and maintenance was processed for 28 days. The mortars that had reached the age of 28 days were tested according to the Indonesian National Standard (SNI) including physical properties (density), and mechanical properties (compressive strength, modulus of elasticity, modulus of rupture). Characterization of microstructure, morphology and composition of all elements on the surface of mortar were processed by using Scanning Electron Microscopy - Energy Dispersive X-ray Spectroscopy (SEM-EDS). The results of research shows the influence of adding corn cob ash to physical and mechanical properties of mortar. Mortar with the most optimum physical and mechanical properties is mortar with a composition of 82: 6: 12. The results of the characterization using SEM-EDS shows that the surface of this composition sample is better then other sample. The most dominant elements in the mortar are element of Ca and Si which functioned as mortar binder and hardener.

***Keywords**: Mechanical properties, mortar, physical properties, SEM-EDS.*

ABSTRAK

PENGARUH PENAMBAHAN ABU TONGKOL JAGUNG TERHADAP SIFAT FISIS DAN MEKANIS PADA MORTAR

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Penelitian yang dilakukan tentang pengaruh penambahan abu tongkol jagung terhadap sifat fisis dan mekanis mortar. Mortar dicetak dengan tiga perbandingan komposisi antara semen ordinary portland, abu tongkol jagung, dan serat kulit jagung. Abu tongkol jagung dibakar pada suhu 700 □ selama 2 jam, serat kulit jagung dirajang secara mekanis hingga berukuran 0,8 mm, kemudian dilakukan pencetakan mortar dan perawatan selama 28 hari. Mortar yang telah mencapai usia 28 hari di uji sesuai dengan Standar Nasional Indonesia (SNI), yang meliputi sifat fisis (kerapatan), dan sifat mekanis (kuat tekan, kuat tarik belah, kuat lentur). Karakterisasi struktur mikro, morfologi, dan komposisi semua unsur yang ada pada permukaan mortar dilakukan menggunakan Scanning Electron Microscopy – Energy Dispersive X-ray Spectroscopy (SEM-EDS). Hasil penelitian menunjukkan adanya pengaruh penambahan abu tongkol jagung terhadap sifat fisis dan mekanis mortar. Mortar dengan sifat fisis dan mekanis yang paling optimum adalah mortar dengan komposisi 82:6:12. Hasil karakterisasi menggunakan SEM-EDS memperlihatkan permukaan mortar tersebut adalah yang lebih baik. Unsur yang paling dominan pada mortar adalah unsur Ca dan Si yang berfungsi sebagai pengikat dan pengeras mortar.

Kata Kunci: Mortar, sifat fisis, sifat mekanis, SEM-EDS.