

PEMANFAATAN SAMPAH DAUN SEBAGAI BAHAN CAMPURAN PEMBUATAN PAPAN PANEL SEMEN DENGAN BAHAN IKAT SEMEN INSTAN MU 200

R. Intan Permata Lestari¹, Sudarmoko², Djoko Sulisty²

INTISARI

Pencemaran lingkungan yang terjadi di kota – kota besar Indonesia menuntut adanya pembangunan yang berkelanjutan. Pemanfaatan sampah daun sebagai bahan bangunan dapat dijadikan alternatif untuk menyelesaikan masalah dan memenuhi kebutuhan akan material hijau dengan konsep *reduce, reuse* dan *recycle* (3R) yang mendukung proses pembangunan berkelanjutan. Sampah daun dapat dimanfaatkan sebagai papan panel menggunakan semen instan sebagai bahan pengikat. Tujuan penelitian ini adalah untuk mengetahui sifat fisik dan mekanik papan panel sampah daun seperti rembesan air, daya serap air, kadar air, pengembangan tebal, densitas, berat jenis, kemampuan dipaku, kuat lentur, kuat tekan dan kuat tarik.

Papan panel semen sampah daun dibuat dari daun Glodogan, dengan ketebalan 0,168 mm, yang dipotong – potong dengan ukuran panjang 5 – 20 mm, lebar 3 – 10 mm, direndam dalam air dingin selama 24 jam kemudian dikeringkan pada suhu ruang selama 1 hari. Bahan ikat menggunakan Semen Instan Acian MU 200. Perbandingan volume campuran Semen Instan MU 200 : Pasir : Sampah Daun adalah 1:1,2:0; 1:1,2:0,4; 1:1,2:0,8; 1:1,2:1,2; 1:1,2:1,6 dan 1:1,2:2 dengan f.a.s. 0,43. Pembuatan benda uji dilakukan dengan penggetaran menggunakan *vibrating table* selama 30 – 60 detik kemudian dilakukan pengempaan hidraulis dengan beban pengempaan 3 kg/cm².

Hasil penelitian menunjukkan penambahan sampah daun meningkatkan daya serap air, kadar air dan pengembangan tebal serta menurunkan densitas, berat jenis, kuat lentur, kuat tekan dan kuat tarik. Campuran dengan komposisi 1 Semen Instan MU 200 : 1,2 Pasir : 0,4 Sampah Daun merupakan campuran dengan sampah daun yang memungkinkan untuk dikembangkan. Campuran ini memiliki kadar air, pengembangan tebal, daya serap air terendah yaitu 4,05%, 1,05%, 10,23% sehingga memenuhi standar maksimum kadar air 13% (SNI 01-4449-2006), pengembangan tebal 10% (SNI 01-4449-2006) dan daya serap air 35% (SNI 15-0233-1989) serta densitas, berat jenis, kuat lentur, kuat tekan dan kuat tarik tertinggi yaitu 1,82, 1841,57 kg/m³, 2,59 MPa, 5,42 MPa dan 1,42 MPa. Berat jenis campuran ini memenuhi persyaratan densitas minimum 1,2 dan standar rembesan air sesuai SNI 15-0233-1989. Kuat lentur papan panel sampah daun belum memenuhi persyaratan minimum SNI 15-0233-1989 10 MPa.

Kata kunci : papan panel semen, sampah daun, kuat lentur, daya serap air

¹ Departemen PU, Pusbin KPK

² Staf Pengajar Magister Teknologi Bahan Bangunan Prodi S2 Jurusan Teknik Sipil dan Lingkungan FT UGM

CEMENT BOARD PANELS MADE OF LEAF LITTER WITH CEMENT INSTANT MU 200 AS BONDING AGENT

ABSTRACT

Environmental pollution that occurred in the big cities in Indonesia require for sustainable development. Utilization of leaf waste as building materials can be used as an alternative to eliminate the problem and supply the demand for a green material with the concept of reduce, reuse and recycle (3R), which supports the sustainable development process. Waste leaves can be used as panel boards using instant cement as bonding agent. The purpose of this research was to determine the physical and mechanical properties of leaf waste panel board such as seepage water, water absorption, moisture content, the development of thick, density, specific gravity, the capability to absorb impact due to nail, flexural strength, compressive strength and tensile strength.

Leaves waste cement board panel was made from the leaves of Glodogan, with a thickness of 0.168 mm, which has been cut to length 5 – 20 mm, width of 3 – 10 mm, soaked in cold water for 24 hours then dried in room temperature for a day. Instant Cement for Finishing Coat MU 200 was used in this research as bonding agent. Volume ratio of Instant Semen MU 200 : Sand : Waste Leaves were 1:1.2:0; 1:1.2:0.4; 1:1.2:0.8; 1:1.2:1.2; 1:1.2:1.6 and 1:1.2: 2 with water cement ratio of 0.43. The specimen was made by giving a vibration using vibration table of 30 – 60 seconds and hydraulic pressing of 3 kg/cm².

The results showed the addition of leaves waste increase water absorption, moisture content and the development of thick and decrease the density, specific gravity, flexural strength, compressive strength and tensile strength. The mixture with composition 1 Instant Cement MU 200: 1.2 Sand: 0.4 Leaves Waste is mixed with leaves waste that possible for further development. This mixture has lowest water content, the development of thick, water absorption of 4.05%, 1.05%, 10.23% respectively which qualify the maximum standard of 13% water content (SNI 01-4449-2006), the development of thick 10% (SNI 01-4449-2006) and water absorption 35% (SNI 15-0233-1989) and highest density, specific gravity, flexural strength, compressive strength and ultimate tensile strength of 1.82, 184.57 kg/m³, 2.59 MPa, 5.42 MPa and 1.42 MPa respectively. The density of this mixture qualify the minimum requirements of 1.2 standard density and water seepage in accordance with SNI 15-0233-1989. Leaves waste cement boards panel has not qualify the requirements of the capability to absorb impact due to nail and minimum requirement for flexural strength of 10 MPa according to SNI 15-0233-1989.

Key words: cement board panel, leaves waste, flexural strength, water absorption