

PENGARUH MACAM KATALIS DAN UKURAN PARTIKEL TERHADAP SIFAT PAPAN SEMEN LIMBAH BAMBUPETUNG

(*Dendrocalamus asper* Backer)

Oleh:

Asih Ardianisa¹ dan T.A Prayitno²

INTISARI

Meningkatnya kebutuhan manusia terutama produk konstruksi mengakibatkan berkurangnya ketersediaan kayu bulat. Bahan yang dapat digunakan sebagai alternatif pengganti kayu bulat yaitu bambu. Limbah serutan bambu petung diolah menjadi produk komposit berupa papan semen. Penelitian ini bertujuan untuk mengetahui pengaruh interaksi macam katalis dan ukuran partikel terhadap sifat papan semen bambu petung.

Penelitian ini menggunakan rancangan acak lengkap dengan percobaan faktorial 2 faktor yaitu faktor macam katalis (K1 : $MgCl_2$ dan K2 : $CaCl_2$) dan faktor ukuran partikel (U1 : lolos 1 cm x 1 cm tertahan 0,5 cm x 0,5 cm, U2 : lolos 0,5 cm x 0,5 cm tertahan 0,2 cm x 0,2 cm dan U3 : lolos 0,2 cm x 0,2 cm tertahan 0,1 cm x 0,1 cm). Hasil analisis varians yang berbeda nyata kemudian diuji dengan uji HSD (*Honestly Significant Difference*) Tukey pada taraf uji 1% dan 5%. Parameter yang diuji pada penelitian ini berdasarkan Standar DIN 1101, Bison (1975) dan FAO (1996) yaitu kerapatan, kadar air, penyerapan air, pengembangan tebal, pengurangan tebal akibat tekanan 3 kg/cm², modulus patah dan modulus elastisitas.

Hasil penelitian menunjukkan bahwa interaksi antara macam katalis dan ukuran partikel berpengaruh nyata terhadap pengurangan tebal akibat tekanan 3 kg/cm². $CaCl_2$ dan partikel lolos 0,2 cm x 0,2 cm tertahan 0,1 cm x 0,1 cm memberikan nilai pengurangan tebal terendah yaitu 3,01%. Faktor macam katalis memberikan pengaruh terhadap modulus elastisitas. $CaCl_2$ menghasilkan modulus elastisitas lebih tinggi dibanding $MgCl_2$. Faktor ukuran partikel memberikan pengaruh terhadap sifat fisika dan mekanika papan semen bambu petung. Semakin kecil ukuran partikel akan meningkatkan nilai kerapatan, modulus patah dan modulus elastisitas dan menurunkan nilai kadar air, penyerapan air, pengembangan tebal serta pengurangan tebal akibat tekanan 3 kg/cm². Bila dibandingkan dengan standar, nilai rata-rata kadar air memenuhi standar Bison (1975), kerapatan memenuhi standar DIN 1101, penyerapan air memenuhi standar FAO (1996), pengembangan tebal 33% memenuhi standar Bison (1975), pengurangan tebal akibat tekanan 3 kg/cm² memenuhi standar DIN 1101, modulus patah 33% memenuhi standar DIN 1101 dan 83% memenuhi standar Bison (1975) serta modulus elastisitas 67% memenuhi standar FAO (1996).

Kata kunci: Papan semen, macam katalis, ukuran partikel, bambu petung

¹ Mahasiswa Bagian Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

² Dosen Bagian Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

EFFECT OF CATALYST TYPES AND PARTICLE SIZE ON PROPERTIES OF PETUNG BAMBOO CEMENT BOARD

(*Dendrocalamus asper* Backer)

by :

Asih Ardianisa¹ and T.A Prayitno²

ABSTRACT

The increasing demand in construction products has been reducing the log availability. Material that can be used as a substitute of logs is bamboo. Petung bamboo shavings were processed into composite products such as cement board. This study aimed to determine the effect of interaction between the type of catalyst and particle size on cement board properties of petung bamboo.

This study used a completely randomized experimental design with two factors, there were catalyst type factors (K1 : $MgCl_2$ and K2 : $CaCl_2$) and particle size factors (U1 : passed 1 cm x 1 cm restrained 0.5 cm x 0.5 cm, U2 : passed 0.5 cm x 0.5 cm restrained 0.2 cm x 0.2 cm and U3 : passed 0.2 cm x 0.2 cm restrained 0.1 cm x 0.1 cm). The result of variance analysis that showed a significant different was tested with Tukey Honestly Significant Difference at level 1 % and 5 %. The parameters tested of this study based on DIN 1101 standards, Bison (1975) and FAO (1996) standards, there were density, water content, water absorption, thickness swelling, the reduction of thickness due to pressure of 3 kg /cm², modulus of rupture and modulus of elasticity.

The results showed that the interaction between the type of catalyst and the particle size significantly affected the reduction of thickness due to pressure of 3 kg/cm². $CaCl_2$ and particle passed 0.2 cm x 0.2 cm restrained 0.1 cm x 0.1 cm gave the lowest value of the thickness reduction is 3.01%. Type of catalyst factor affected the modulus of elasticity. The value of modulus of elasticity in cement board with $CaCl_2$ higher than cement board with $MgCl_2$. Particle size factor affected in physical and mechanical properties of petung bamboo cement board. Particle size factor, bigger to smaller, the value of density, modulus of rupture and modulus of elasticity increased, in the other side the value of water content, water absorption, thickness swelling and the reduction of thickness due to pressure of 3 kg/cm² decreased. Compared to the standard, the average of water content has met Bison (1975) standards, density has met DIN 1101 standards, water absorption has met FAO (1996) standards, thickness swelling has met 33% of Bison (1975) standards, the reduction of thickness due to pressure of 3 kg /cm² has met DIN 1101 standards, modulus of rupture has met 33 % of DIN 1101 standards and has met 83% of Bison (1975) standards, modulus of elasticity has met 67% of FAO (1996) standards.

Keywords: Cement board, type of catalyst, particle size, petung bamboo

¹ Student of Forest Products Technology Department, Faculty of Forestry, Universitas Gadjah Mada

² Lecturer of Forest Products Technology Department, Faculty of Forestry, Universitas Gadjah Mada