

PENGARUH UKURAN PARTIKEL DAN KADAR ASAM SITRAT
TERHADAP SIFAT – SIFAT PAPAN PARTIKEL CAMPURAN TONGKOL
JAGUNG DAN BAMBU PETUNG

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INTISARI

Tongkol jagung dan bambu petung adalah bahan baku berlignoselulosa yang dapat dimanfaatkan sebagai bahan baku papan partikel. Penggunaan asam sitrat sebagai agen pengikat diharapkan dapat meningkatkan sifat fisika dan mekanika papan partikel. Penelitian ini bertujuan untuk mengetahui pengaruh interaksi ukuran partikel dan kadar asam sitrat terhadap sifat fisika dan mekanika papan partikel campuran tongkol jagung dan bambu petung.

Penelitian papan partikel campuran tongkol jagung dan bambu petung ini menggunakan rancangan acak lengkap (RAL) dengan faktor ukuran partikel menggunakan dua aras, yaitu kasar (lolos 4 mesh tertahan 10 mesh) dan halus (lolos 10 mesh), sedangkan kadar asam sitrat dengan tiga aras, yaitu 10%, 20%, dan 30%. Papan partikel dibuat menggunakan komposisi 50% tongkol jagung dan 50% bambu petung dalam ukuran 25 x 25 x 1 cm³ dengan target kerapatan 0,7 g/cm³ dan dikempa panas dengan suhu 180°C tekanan 3,5 MPa selama 10 menit. Standar pengujian mengacu SNI 03-2105 (2006). Data pengujian dianalisis menggunakan *Analysis of Varians* (ANOVA) dan pengujian lanjut *Honestly Significant Difference* (HSD).

Hasil penelitian menunjukkan interaksi ukuran partikel dan kadar asam sitrat berpengaruh nyata terhadap pengembangan tebal dan keteguhan rekat internal papan partikel. Ukuran partikel berpengaruh terhadap penyerapan air, modulus patah, dan modulus elastisitas, sedangkan kadar asam sitrat berpengaruh terhadap kerapatan, penyerapan air, dan modulus elastisitas. Hasil terbaik diperoleh pada perlakuan ukuran partikel kasar dan kadar asam sitrat 20% dengan kerapatan 0,63 g/cm³, kadar air 5,62%, pengembangan tebal 4,64%, penyerapan air 39,74%, keteguhan rekat internal 0,28 MPa, modulus patah 7,12 MPa, dan modulus elastisitas 2,13 GPa. Semua sifat fisika dan mekanika papan partikel telah memenuhi SNI 03-2105 (2006) kecuali modulus patah.

Kata Kunci: papan partikel, tongkol jagung, bambu petung, ukuran partikel, kadar asam sitrat

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EFFECT OF PARTICLE SIZE AND CITRIC ACID CONTENT ON PROPERTIES OF HYBRID PARTICLEBOARD FROM CORN COB AND PETUNG BAMBOO

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ABSTRACT

Corn cob and petung bamboo are lignocellulosic raw materials that can be used as raw materials for particleboard. The use of citric acid as a binding agent is expected to enhance the physical and mechanical properties of particleboard. This study aimed to determine the effect of particle size and citric acid content interaction on the physical and mechanical properties of hybrid particleboard made from corn cob and petung bamboo.

This study of hybrid particleboard made from corn cob and petung bamboo used completely randomized design (CRD) with particle size factor using two levels, coarse (passed 4 mesh, retained 10 mesh) and fine (passed 10 mesh), while citric acid with three levels i.e. 10%, 20%, and 30%. Particleboards were made using a composition of 50% corn cob and 50% petung bamboo in a size of 25 x 25 x 1 cm³ with target density of 0.7 g/cm³ and hot pressed with temperature of 180°C, pressure of 3,5 MPa for 10 minutes. Properties of manufactured particleboards were examined according to SNI 03-2105 (2006). Data were analyzed using Analysis of Variance (ANOVA) and further tested using Honestly Significant Difference (HSD).

Result showed that the interaction of particle size and citric acid content significantly affected thickness swelling and internal bond strength of particleboard. Particle size affected water absorption, modulus of rupture, and modulus of elasticity, while citric acid content affected density, water absorption, and modulus of elasticity. Best result was obtained from particleboard made with coarse particle and citric acid content of 20% with density of 0.63 g/cm³, moisture content of 5.62%, thickness swelling of 4.64%, water absorption of 39.74%, internal bond strength of 0.28 MPa, modulus of rupture of 7.12 MPa, and modulus of elasticity of 2.13 GPa. All physical and mechanical properties of the particleboard met the requirements of SNI 03-2105 (2006) except the modulus of rupture.

Keywords: particleboard, corn cob, petung bamboo, particle size, citric acid content

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