

## PENGARUH KOMPOSISI BAHAN DAN JUMLAH ASAM SITRAT TERHADAP KARAKTERISTIK PAPAN PARTIKEL CAMPURAN TONGKOL JAGUNG DAN KAYU SENGON

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### INTISARI

Limbah tongkol jagung dan partikel sengon merupakan bahan yang mengandung lignoselulosa dan berpotensi sebagai bahan baku untuk pembuatan papan partikel. Penggunaan asam sitrat diharapkan dapat menggantikan perekat sintetis untuk menjadi pengikat bagi papan partikel. Penelitian ini bertujuan untuk mengetahui pengaruh komposisi bahan dan jumlah pengikat asam sitrat terhadap sifat fisika dan mekanika papan partikel campuran tongkol jagung dan sengon. Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) yang disusun secara faktorial dengan dua faktor yaitu komposisi bahan tongkol jagung:sengon (100:0, 75:25, 50:50, 25:75, dan 0:100) dan jumlah pengikat asam sitrat (10% dan 15%). Dimensi papan partikel dibuat dengan ukuran 25 cm x 25 cm x 1 cm dengan target kerapatan 0,7 g/cm<sup>3</sup>. Standar yang digunakan untuk acuan adalah SNI 03-2105-2006. Data hasil pengujian papan partikel dianalisis dengan analisis varian (ANOVA) dengan pengujian lanjut *Honestly Significant Difference* (HSD). Hasil penelitian menunjukkan bahwa faktor komposisi bahan berbeda nyata terhadap kadar air, pengembangan tebal, penyerapan air, keteguhan rekat internal, dan modulus patah papan. Faktor jumlah pengikat berpengaruh nyata terhadap kadar air dan keteguhan rekat internal papan partikel tongkol jagung-sengon. Papan partikel campuran tongkol jagung dan sengon yang memiliki nilai terbaik diperoleh pada perlakuan komposisi bahan tongkol jagung:sengon (50:50) dan jumlah pengikat asam sitrat 15%. Nilai sifat fisika mekanika yang diperoleh diantaranya, nilai kerapatan 0,61 g/cm<sup>3</sup>, kadar air 4,92%, pengembangan tebal 8,64%, penyerapan air 73,24%, modulus elastisitas 0,99 GPa, modulus patah 4,31 MPa, dan keteguhan rekat internal 0,3 MPa.

**Kata Kunci:** papan partikel, tongkol jagung, sengon, asam sitrat, komposisi bahan

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**EFFECT OF MATERIAL COMPOSITION AND CITRIC ACID  
CONTENT ON THE CHARACTERISTICS OF HYBRID CORN COBS-  
SENGON WOOD PARTICLEBOARD**

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**ABSTRACT**

The waste of corn cob and sengon wood particle are lignocellulosic material that can be used for particleboard production. The use of citric acid is expected to substitute synthetic adhesives as a binder for particleboard. This study aimed to determine the effect of material composition and the amount of citric acid binder on the physical and mechanical properties of particleboard. A completely randomized design (CRD) was used as experimental design with two factors, namely the composition of corn cobs: sengon (100:0, 75:25, 50:50, 25:75, and 0:100) and the amount of citric acid binder (10% and 15 %). The particleboards were made with dimension of 25 cm x 25 cm x 1 cm and target density of 0.7 g/cm<sup>3</sup>. The performance of manufactured particleboard was tested according to SNI 03-2105-2006. The data were analyzed by analysis of variance (ANOVA) with further Honestly Significant Difference (HSD) test. The results of this study indicated that the material composition significantly affected moisture content, thickness swelling, water absorption, internal bonding, and modulus of rupture of the board. The amount of citric acid binder had significant effect on the moisture content and internal bonding of the particleboard. The best property of the hybrid particleboard was obtained from particleboard with composition of corncob-sengon 50:50 and 15% citrid acid binder, which resulted in density of 0.61 g/cm<sup>3</sup>, moisture content of 4.92%, thickness swelling of 8.64%, water absorption of 73.24%, modulus of elasticity of 0.99 GPa, modulus of rupture of 4.31 MPa, and internal bonding of 0.3 MPa.

**Keywords:** particleboard, corncob, sengon, citric acid, material composition

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