

## **PENGARUH LAMA WAKTU PENGERINGAN PENDAHULUAN DAN METODE PENGEMPAAN TERHADAP SIFAT PAPAN PARTIKEL BAMBU APUS**

Oleh:

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### **INTISARI**

Kadar air merupakan salah satu faktor penting yang menentukan kualitas papan partikel. Kadar air yang terlalu tinggi dapat menyebabkan delaminasi. Salah satu cara untuk menurunkan kadar air adalah menerapkan pengeringan pendahuluan sebelum dibuat mat/kasuran. Cara lain untuk menghindari delaminasi adalah penggunaan sistem buka tutup pada proses pengempaan. Semakin pendek waktu pengeringan menyebabkan kadar air pada mat masih tinggi, sehingga uap air yang terbentuk diduga perlu dikeluarkan selama proses pengempaan. Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh variasi lama pengeringan pendahuluan dan metode pengempaan terhadap sifat fisika mekanika papan partikel bambu apus.

Penelitian ini menggunakan rancangan acak lengkap (RAL) dengan dua faktor yaitu lama waktu pengeringan pendahuluan (0 jam, 2 jam, 4 jam) dan metode pengempaan (2,5:1:7,5 menit), (5:1:5 menit), (7,5:1:2,5 menit). Papan partikel dibuat menggunakan komposisi perekat sukrosa-asam sitrat (75:25) dan jumlah 10% dengan dimensi 25 cm x 25 cm x 1 cm dan target kerapatan 0,8 g/cm<sup>3</sup>. Pengempaan dilakukan pada suhu 200°C serta tekanan kempa 3 MPa selama 10 menit. Pengujian dilakukan dengan mengacu *Japanese Industrial Standard (JIS) A 5908 (2003)* dan *FAO (1996)*. Data hasil pengujian dianalisis menggunakan analisis varians (ANOVA) dan pengujian lanjut *Honestly Significant Difference (HSD)*.

Hasil penelitian menunjukkan interaksi lama waktu pengeringan pendahuluan dan metode pengempaan berpengaruh nyata terhadap keteguhan rekat internal. Faktor tunggal pengeringan pendahuluan berpengaruh nyata pada penyerapan air, keteguhan rekat internal, modulus patah, dan modulus elastisitas. Di sisi lain, faktor tunggal metode pengempaan hanya berpengaruh nyata pada keteguhan rekat internal. Sifat papan partikel terbaik diperoleh pada papan partikel bambu apus dengan perlakuan pengeringan pendahuluan 2 jam dengan metode pengempaan (7,5:1:2,5) menit. Papan tersebut memenuhi standar *JIS A 5908 (2003) Tipe 18* dengan nilai kerapatan 0,76 g/cm<sup>3</sup>, kadar air 6,78%, pengembangan tebal 7,3%, penyerapan air 28,8%, keteguhan rekat internal 1,2 MPa, modulus patah 25,7 MPa, dan modulus elastisitas 5,0 GPa.

**Kata Kunci:** papan partikel, bambu apus, kadar air, pengeringan pendahuluan, metode pengempaan.

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## THE EFFECTS OF PRE-DRYING TIME AND PRESSING METHOD ON THE PROPERTIES OF PARTICLE BOARDS MADE FROM APUS BAMBOO

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### ABSTRACT

Moisture content is one of the important factors that determine the quality of particle board. A moisture content that too high can cause delamination. One way to reduce the moisture content is to apply pre-drying before matting. Another way to avoid delamination is to apply three-steps method in the pressing process. The shorter pre-drying time causes the moisture content in the mat still in a high condition, so the water vapor that is formed was expected to be removed during the pressing process. Therefore, this study aims to determine the effect of variations of pre-drying time and pressing method on the physical and mechanical properties of apus bamboo particle board.

This study used a completely randomized design (CRD) with two factors, namely pre-drying times (0 hour, 2 hours, 4 hours) and the pressing methods (2.5:1:7.5 minutes), (5:1:5 minutes), (7.5:1:2.5 minutes). Particle board was made using an adhesive composition of sucrose-citric acid (75:25) and an amount of 10% with dimensions of 25 cm x 25 cm x 1 cm and the target of the density is 0.8 g/cm<sup>3</sup>. Pressing temperature was set at 200°C and a pressure of 3 MPa, while the total pressing time was 10 minutes. The properties of particle board were measured based on Japanese Industrial Standard (JIS) A 5908 (2003) and FAO (1996). The test results were analyzed using analysis of variance (ANOVA) and further testing Honestly Significant Difference (HSD).

The results showed that the interaction between the duration of the pre-drying time and the pressing method had a significant effect on the internal bonding. The single factor of pre-drying time has significant effects on water absorption, internal bonding, modulus of rupture, and modulus of elasticity. On the other hand, the single factor of the pressing method has a significant effect on the internal bonding. The best particle board properties were obtained from apus bamboo particle board with 2 hours pre-drying time with the pressing method (7.5:1:2.5) minutes. The properties of the particle board reach the standard of JIS A 5908 (2003) Type 18 i.e.: density is 0.76 g/cm<sup>3</sup>, moisture content is 6.78%, thickness swelling is 7.3%, water absorption is 28.8%, internal bonding is 1.2 MPa, modulus of rupture is 25.7 MPa, and the modulus of elasticity is 5.0 GPa.

**Keywords:** particleboard, apus bamboo, moisture content, pre-drying, pressing method.

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