

SIFAT PAPAN PARTIKEL NIR-PEREKAT DENGAN  
PROSES KEMPA PANAS DARI LIMBAH SERUTAN BAMBUPETUNG  
(*Dendrocalamus asper* Backer)

Oleh :

Fithry Ardhan<sup>1</sup>, TA. Prayitno<sup>2</sup> dan Ragil Widyorini<sup>2</sup>

INTISARI

Kepedulian terhadap lingkungan semakin meningkat dari waktu ke waktu. Sebagai usaha untuk mengatasi masalah lingkungan, produk panel berbasis kayu tanpa menggunakan perekat telah banyak diteliti. Pemanfaatan limbah bambu secara optimal dapat dilakukan dengan pembuatan produk papan partikel nir-perekat. Teknologi papan partikel nir-perekat merupakan alternatif yang dapat dilakukan untuk meminimalkan efek negatif perekat sintetis terhadap lingkungan. Tujuan dari penelitian ini adalah menganalisis pengaruh perlakuan pendahuluan (perebusan), suhu pengempaan dan lama pengempaan terhadap sifat papan partikel nir-perekat bambu petung (*Dendrocalamus asper* Backer) serta untuk mengetahui perubahan sifat sel dan komposisi kimia karena proses pengempaan.

Papan partikel nir-perekat dibuat dari limbah bambu petung dengan menggunakan proses kempa panas. Penelitian ini menggunakan rancangan acak lengkap dengan tiga faktor perlakuan, yaitu perlakuan pendahuluan (perebusan), suhu pengempaan (180°C, 200°C, 220°C) dan lama pengempaan (10 menit dan 15 menit). Sifat fisika dan mekanika papan partikel nir-perekat diuji sesuai Standar JIS A 5908-1994 (tipe-8) meliputi: kerapatan, kadar air, penyerapan air, pengembangan tebal, keteguhan rekat internal, modulus patah, dan modulus elastisitas. Pengujian kimia kayu meliputi: kadar ekstraktif, kadar holoselulosa, kadar  $\alpha$ -selulosa, kadar hemiselulosa dan kadar lignin.

Hasil penelitian menunjukkan bahwa faktor tunggal suhu pengempaan memberikan pengaruh yang nyata terhadap semua sifat fisika papan partikel nir-perekat. Perubahan komposisi kimia terjadi akibat proses pengempaan panas yang berdampak pada perubahan sifat sel dan sifat mekanika papan partikel nir-perekat. Sifat fisika terbaik diperoleh pada papan partikel nir-perekat tanpa perlakuan pendahuluan perebusan dengan suhu pengempaan 220°C selama 15 menit yaitu kerapatan 0,59 g/cm<sup>3</sup>, kadar air 5,96%, penyerapan air 34,32%, pengembangan tebal 2,06%.

**Kata kunci :** Papan partikel nir-perekat, perlakuan pendahuluan, suhu pengempaan, lama pengempaan, limbah bambu petung

<sup>1</sup> Mahasiswa S2-PSIK Pascasarjana, Universitas Gadjah Mada

<sup>2</sup> Dosen PSIK Pascasarjana, Universitas Gadjah Mada

**PROPERTIES OF BINDERLESS PARTICLEBOARD USING HOT PRESSING PROCESS FROM PETUNG BAMBOO WASTE**  
(*Dendrocalamus asper* Backer)

By :

**Fithry Ardhan<sup>1</sup>, T.A. Prayitno<sup>2</sup> and Ragil Widyorini<sup>2</sup>**

**ABSTRACT**

Recently, it has become more and more important to minimize environmental pollution. As an attempt to alleviate the environmental problems in materials, new wood based materials without any adhesives and binders have been investigated. Optimizing of petung bamboo waste can be achieved by manufacturing binderless particleboard. Binderless particleboard has been considerable interest in issues regarding the negative side effect of synthetic glues on the environment. This research was designed to analyze their physical and mechanical properties and evaluate the various manufacturing conditions: pre-treatment (boiling), pressing temperature and pressing time. The other objectives are to know the alteration of cell properties and the degradation of chemical composition.

Binderless particleboards were manufactured from petung bamboo waste (*Dendrocalamus asper* Backer) by hot pressing process. This study was conducted using Completely Randomized Design into factorial by three conditions: pre-treatment (boiling), pressing temperature (180°C, 200°C and 220°C) and pressing time (10 minutes and 15 minutes). The board properties were evaluated by JIS A 5908-1994 (type-8) as follows: density, moisture content, water absorption, thickness swelling, internal bonding, modulus of rupture, and modulus of elasticity. Chemical analyzes were extractive content, holocelluloses content,  $\alpha$ -celluloses content, hemicelluloses content and lignin content.

The result showed that single factor pressing time was affected on all of physical properties of binderless particleboard. Degradation of chemical composition occurs during the hot pressing process which affected on cell properties changing. The best properties of binderless particleboard was obtained at 15 minutes highest pressing temperature (220°C) on particles without boiling, which have density 0,59 g/cm<sup>3</sup>, moisture content 5,96%, water absorption 34,32%, thickness swelling 2,06%.

**Key words:** binderless particleboard, pre-treatment condition, pressing temperature, pressing time, petung bamboo waste

---

<sup>1</sup> Student of Forest Science Graduate School, Gadjah Mada University

<sup>2</sup> Lecturer of Forest Science Graduate School, Gadjah Mada University