

PENGARUH KOMPOSISI BAHAN DAN SUHU KEMPA TERHADAP SIFAT PAPAN KOMPOSIT PLASTIK DAUN NANAS (*Ananas comosus* (L) Merr)

Oleh :
Margareta Irene Widhasari¹ dan T.A. Prayitno²

INTISARI

Kebutuhan kayu makin bertambah seiring dengan pertambahan jumlah penduduk. Hal tersebut menuntut penggunaan kayu secara efisien dan pencarian bahan alternatif pengganti kayu. Teknologi komposit dengan memanfaatkan daun nanas (*A. comosus* (L) Merr.) dan plastik LDPE merupakan salah satu cara untuk mengatasi masalah tersebut. Penelitian ini bertujuan untuk mengetahui pengaruh interaksi komposisi bahan dan suhu kempa terhadap sifat-sifat papan komposit plastik daun nanas.

Bahan yang digunakan dalam penelitian ini adalah partikel daun nanas dan plastik *low density polyethilen*. Rancangan penelitian yang digunakan adalah rancangan acak lengkap yang disusun secara faktorial dengan dua faktor yaitu komposisi partikel daun nanas dan plastik (1:2, 1:1, dan 2:1), dan suhu kempa (130⁰C, 150⁰C, dan 170⁰C). Parameter yang diuji adalah kerapatan, kadar air, penyerapan air, pengembangan tebal, modulus patah, modulus elastisitas, dan internal bonding dengan menggunakan standar uji JIS A 5908.

Hasil penelitian menunjukkan bahwa interaksi faktor komposisi bahan dan suhu kempa memberi pengaruh terhadap sifat kerapatan, kadar air, pengembangan tebal, modulus patah, dan keteguhan ikat internal (*internal bonding*). Faktor komposisi bahan memberi pengaruh terhadap penyerapan air dan modulus elastisitas papan komposit plastik daun nanas. Makin banyak plastik dalam komposisi, makin rendah penyerapan air dan nilai modulus elastisitas papan komposit plastik daun nanas. Penggunaan kombinasi perbandingan partikel daun nanas dan plastik 1:1 dengan suhu kempa 170⁰C menghasilkan papan komposit dengan sifat terbaik, yaitu kerapatan 0,685 gr/cm³, kadar air 5,921%, penyerapan air 36,111%, pengembangan tebal 1,499%, *internal bonding* 2,069, MoR 53,714 kg/cm², dan MoE 1685,463 kg/cm². Berdasarkan perbandingan dengan standar industri, sifat fisik papan komposit sudah memenuhi standar, namun sifat mekanik masih belum memenuhi standar.

Kata kunci : papan komposit, daun nanas, plastik LDPE, komposisi bahan, suhu kempa

1 Mahasiswa Jurusan Teknologi Hasil hutan, Fakultas Kehutanan, Universitas Gadjah Mada

2 Staf Pengajar Jurusan Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada

EFFECT OF MATERIAL COMPOSITION AND PRESSING TEMPERATURE ON THE PROPERTIES OF PINEAPPLE LEAF (*Ananas comosus* (L) Merr) - PLASTIC COMPOSITE BOARD

By :
Margareta Irene Widhasari¹ and T.A. Prayitno²

ABSTRACT

As wood demand increases along with population, efficient wood technology and alternatives timber substitute materials must be developed. Composite technology using pineapple leaf (*A. comosus* (L) Merr) and LDPE plastic can be used to solve this problem. The aim of this research was to investigate the effect of material composition and pressing temperature on the properties of pineapple leaf-plastic composite board.

In this research, pineapple leaf particle and low density polyethilen plastic were used as material. The research was conducted using Completely Randomized Design and arranged into factorial by 2 factors. The factors were material composition between pineapple leaf particle and plastic (1:2, 1:1, and 2:1), and pressing temperature (130⁰C, 150⁰C, and 170⁰C). JIS A 5908 was used for evaluating the properties of composite board that included density, moisture content, water absorption, thickness swelling, modulus of rupture, modulus of elasticity, and internal bonding.

The result showed that interaction between material composition and pressing temperature was significantly different on density, moisture content, thickness swelling, modulus of rupture, and internal bonding. Material composition factor was significant on water absorption and modulus of elasticity. The water absorption decreases along with higher plastic content, and modulus of elasticity increases along with higher particle content. Pineapple leaf and plastic composition 1:1 with 170⁰C pressing temperature provided the optimum composite board. The value of density, moisture content, water absorption, thickness swelling, internal bonding, modulus of rupture, modulus of elasticity, and internal bonding were 0,685 g/cm³, 5,921%, 36,111%, 1,499%, 2,069 kg/cm², 53,714 kg/cm², 1685,463 kg/cm², respectively. Almost physical properties of pineapple leaf-plastic composite board met the industrial standard, however the mechanical properties did not meet the particleboard industry standard.

Keywords : composite board, pineapple leaf, LDPE plastic, material composition, pressing temperature

¹ Student of Forest Product Technology Department, Faculty of Forestry, UGM

² Lecturer of Forest Product Technology Department, Faculty of Forestry, UGM