

**PEMBUATAN PAPAN ISOLASI DARI CAMPURAN PULP LIMBAH
PEMBALAKAN HUTAN DAN ARANG AKTIF DENGAN BAHAN
PEREKAT KHITOSAN CANGKANG UDANG**
*(Manufacture of Insulation Board from the Mixture of Forest-Logging
Waste Pulp and Activated Charcoal Using Chitosan from
Shrimp Exoskeleton as Glu)*

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ABSTRACT

This study examined characteristics of insulation board manufactured from the mixture of wood wastes from Eucalyptus hybrid plantation forest (PF) logging and activated charcoal, and the adhesive as used was chitosan derived from the shrimp exoskeleton.

PF-logging's wood wastes were reduced in size to chips, then made into pulp using open hot soda chemical process at the condition being alkali (NaOH) concentration at 8%, wood to liquor ratio 1:8 (w/v), and maximum cooking temperature 100 C held for 3 hours. Insulation-board mat was formed using the wet process from the mixture of PF logging's wood wastes and activated charcoal at the proportions (w/w) consecutively 100% + 0%, 97,5% + 2,5%, 95% + 5%, 92,5% + 7,5%, dan 90%+10%. Prior to mat forming, to the mixture were added 2 kinds of adhesives separately (i.e. chitosan and tapioca as the comparison) 5%each.

Physical and mechanical properties of the resulting insulation board with tapioca were better than those with chitosan. The greater the portion of activated charcoal mixed to the PF-logging's wood wastes, the lower the density and the strength (MOR), the more increased the moisture content, but the more improved the dimensional stability. The insulation board which revealed the most promising prospects and could favorably meet the JIS specification was the one from the mixture proportion of PF-logging's wood wastes and activated charcoal at 97.5% + 2.5%, using tapioca adhesive, and the one from solely 100% PF-logging wastes (without activated charcoal) using chitosan.

Keywords: Wood wastes, Eucalyptus hybrid, insulation board, chitosan glue (adhesive) from shrimp exoskeleton, activated charcoal

ABSTRAK

Telah dilakukan percobaan pembuatan papan isolasi menggunakan bahan baku campuran limbah pembalakan kayu HTI (Hutan Tanaman Industri) jenis *Eucalyptus hybrid* dan arang aktif, dengan penggunaan perekat khitosan dari limbah cangkang udang.

Limbah pembalakan dibuat menjadi serpih, lalu diolah menjadi pulp menggunakan proses semikimia soda panas terbuka pada kondisi: konsentrasi NaOH 8%, nilai banding bahan baku serpih dengan larutan pemasak 1 : 8 (b/v), dan suhu pemasakan maksimum 100 C yang dipertahankan selama 3 jam. Pembentukan papan isolasi menggunakan cara basah dari campuran pulp limbah pembalakan HTI dan arang aktif dengan komposisi (b/b) 100% + 0%, 97,5% + 2,5%, 95% + 5%, 92,5% + 7,5%, dan 90% + 10%. Sebelum dibentuk lembaran, pada campuran tersebut ditambahkan dua macam perekat (khitosan dan tapioka) secara terpisah masing-masing sebanyak 5%.

Sifat fisis dan mekanis papan isolasi dengan perekat pati lebih baik dibandingkan dengan perekat khitosan. Semakin tinggi porsi campuran arang aktif pada pulp limbah pembalakan, cenderung menurunkan kerapatan dan sifat kekuatan (MOR), meningkatkan kadar air, tetapi memperbaiki kestabilan dimensi. Papan isolasi yang memenuhi persyaratan JIS adalah dengan perekat pati pada porsi campuran pulp limbah pembalakan-arang aktif 97,5% + 2,5%, dan papan isolasi dengan perekat khitosan tetapi dari pulp limbah pembalakan 100%.

Kata kunci: Limbah pembalakan kayu HTI, *Eucalyptus hybrid*, papan isolasi, perekat tapioka dan khitosan cangkang udang, arang aktif, sifat fisis dan kekuatan.