

PENGARUH SUHU KEMPA DAN KETEBALAN PAPAN TERHADAP SIFAT PAPAN SERAT KERTAS KORAN BEKAS

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INTISARI

Penelitian ini menggunakan kertas koran bekas sebagai bahan baku pembuatan papan serat. Tujuan penelitian ini adalah untuk mengetahui pengaruh interaksi suhu kempa dan ketebalan papan terhadap sifat papan serat kertas koran bekas.

Rancangan penelitian yang digunakan dalam penelitian ini adalah rancangan acak lengkap yang disusun secara faktorial dengan dua faktor yaitu suhu kempa (140°C, 160°C, dan 180°C) dan ketebalan papan serat (0,5 cm, 0,9 cm, dan 1,2 cm). Parameter yang diuji berdasarkan standar ASTM D 1037-78 meliputi sifat fisika papan serat yaitu kadar air, kerapatan, penyerapan air, dan pengembangan tebal serta sifat mekanika papan serat meliputi keteguhan tekan sejajar permukaan dan keteguhan tarik tegak lurus permukaan.

Hasil penelitian menunjukkan bahwa interaksi faktor suhu kempa dan ketebalan papan berpengaruh terhadap kadar air papan serat (7,8% - 9,55%). Faktor suhu kempa berpengaruh terhadap nilai pengembangan tebal (18,54% - 32,81%), penyerapan air (75,95% - 102,4%), keteguhan tarik tegak lurus (2,332 kg/cm² - 7,311 kg/cm²), dan keteguhan tekan sejajar permukaan (38,42 kg/cm² - 53,67 kg/cm²). Semakin tinggi suhu kempa, nilai pengembangan tebal papan dan penyerapan air semakin rendah sementara nilai keteguhan tekan sejajar permukaan dan keteguhan tarik tegak lurus semakin tinggi. Faktor ketebalan papan berpengaruh terhadap nilai keteguhan tarik tegak lurus papan serat. Semakin tebal papan serat maka nilai keteguhan tarik tegak lurus papan serat semakin rendah. Sifat papan serat kertas koran bekas yang paling optimum dari faktor suhu kempa dan ketebalan papan adalah papan serat dengan suhu kempa 180°C dan ketebalan papan 0,9 cm, dengan rata-rata nilai kadar air sebesar 7,8%; kerapatan 0,749 g/cm³; pengembangan tebal 24 jam 22,495%; penyerapan air 24 jam 87,42%; keteguhan tarik tegak lurus 5,711 kg/cm²; dan keteguhan tekan sejajar permukaan 59,09 kg/cm². Nilai kadar air, kerapatan, dan keteguhan tarik tegak lurus permukaan sudah memenuhi standar FAO, tetapi secara keseluruhan hasil penelitian ini menunjukkan kualitas papan serat kertas koran bekas hasil penelitian masih perlu ditingkatkan.

Kata kunci : papan serat, kertas koran bekas, suhu kempa, ketebalan papan

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THE EFFECT OF PRESSING TEMPERATURE AND BOARD THICKNESS ON THE PROPERTIES OF RECYCLED-NEWSPRINT FIBERBOARD

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ABSTRACT

This research used recycled-newsprint as a raw material for fiberboard. This research aims to find out the interaction of pressing temperature and thickness of board in relation to the characteristics of recycled-newsprint fiberboard.

The research was conducted using Completely Randomized Design and arranged into factorial by two factors. The factors were pressing temperature (140°C, 160°C, and 180°C) and board thickness (0,5 cm, 0,9 cm, and 1,2 cm). The parameters tested based on ASTM D standard 1037-78 included physical and mechanical properties of fiberboard, which were moisture content, density, water absorption, thickness swelling, compression strength parallel to surface, and internal bonding.

The result of this research showed that interaction between pressing temperature and board thickness was significantly different on moisture content (7,8% - 9,55%). Pressing temperature factor was significant on thickness swelling (18,54% - 32,81%), water absorption (75,95% - 102,4%), internal bonding (2,332 kg/cm² - 7,311 kg/cm²), and compression strength parallel to surface (38,42 kg/cm² - 53,67 kg/cm²). The value of water absorption and thickness swelling decrease along with the increased of pressing temperature but the value of compression strength parallel to surface and internal bonding increase along with the increased of pressing temperature. Board thickness factor was significant on internal bonding. The value of internal bonding decrease along with the increased of board thickness. The result of this research also showed that the best properties of recycled-newsprint fiberboard was the board that had interaction between 180°C of pressing temperature and 0,9 cm of board thickness. This board had 7,8% of moisture content; 0,749 g/cm³ of density; 22,495% of 24 hours thickness swelling; 87,42% of 24 hours water absorption; 5,711 kg/cm² of compression strength parallel to surface; and 59,09 kg/cm² internal bonding. The value of density, moisture content, and internal bonding has met the FAO standards, but overall the result of this research shows the quality of recycled-newsprint fiberboard still needs to be improved.

Keywords : fiberboard, recycled-newsprint, pressing temperature, board thickness

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