

SIFAT PEREKATAN KAYU JATI *PLUS* UMUR 20 TAHUN PADA BERBAGAI SUHU DAN WAKTU MODIFIKASI PANAS

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INTISARI

Program pemuliaan kayu jati (*Tectona grandis L.f plus*) sudah dijalankan sejak tahun 2004 oleh Fakultas Kehutanan Universitas Gadjah Mada (UGM) berlokasi di Kawasan Hutan dengan Tujuan Khusus (KHDTK) Wanagama I, Gunungkidul, Yogyakarta. Jati *plus* memiliki kadar air dan nilai kecerahan lebih tinggi, serta stabilitas lebih rendah dibandingkan jati konvensional. Modifikasi seperti perlakuan panas mampu meningkatkan stabilitas dimensi dan menurunkan kadar air serta menghasilkan permukaan kayu lebih gelap dan seragam, akan tetapi kombinasi suhu dan waktu terlalu tinggi berpotensi mengurangi efektifitas perekatan. Oleh sebab itu penelitian ini bertujuan untuk mengetahui sifat fisika dan perekatan kayu jati *plus* dengan variasi suhu dan waktu modifikasi panas.

Rancangan penelitian yang digunakan adalah Rancangan Acak Lengkap (RAL) yang terdiri dari dua faktor, suhu (125°C dan 150°C) dan waktu (2 jam, 3 jam, dan 4 jam). Bahan baku yang digunakan pada penelitian ini, yaitu kayu jati *plus* dan perekat poliuretan dengan berat labur 160 g/m² serta rasio berat komposisi isosianat : polioliol (20:3). Pengujian kualitas laminasi kayu jati *plus* meliputi, sifat fisika (kadar air, kerapatan, sudut kontak, dan perubahan warna) dan sifat perekatan (delaminasi, keteguhan rekat geser, dan persentase kerusakan kayu).

Hasil penelitian menunjukkan bahwa interaksi suhu dan waktu modifikasi panas memberikan pengaruh sangat nyata terhadap delaminasi. Semakin tinggi faktor suhu modifikasi panas memberikan pengaruh nyata terhadap kenaikan sudut kontak dan penurunan nilai kerapatan, keteguhan geser dan persentase kerusakan kayu. Waktu perlakuan panas memberikan pengaruh nyata terhadap nilai keteguhan rekat geser, dan persentase kerusakan kayu. Hasil sifat fisika dan perekatan terbaik laminasi jati diperoleh dari perlakuan suhu 125°C dengan waktu 2 jam modifikasi panas, yaitu penurunan kadar air 35,65%, penurunan kerapatan 2,55%, sudut kontak 67,06°, perubahan warna 4,18 ΔE^* , delaminasi 0%, keteguhan geser 4,41 MPa, kerusakan kayu 71,27%.

Kata Kunci: kayu jati *plus*, modifikasi panas, suhu modifikasi, sifat fisika, sifat perekatan

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**BONDING PROPERTIES OF 20-YEAR-OLD SUPERIOR TEAK WOOD
UNDER VARIOUS TEMPERATURES AND DURATIONS OF HEAT
MODIFICATION**

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ABSTRACT

The teak (*Tectona grandis* L.f) plus breeding program has been running since 2004 by the Faculty of Forestry, Gadjah Mada University (UGM), located in Gunung Kidul, Yogyakarta. Teak plus has a higher moisture content and brightness value, as well as lower stability compared to conventional teak. Modifications such as heat treatment can increase dimensional stability and reduce moisture content, as well as produce a darker and more uniform wood surface. However, excessive combinations of temperature and time can potentially reduce the effectiveness of bonding. Therefore, this study aims to determine the physical and bonding properties of teak plus wood with variations in temperature and time of heat modification.

The research design used was a completely randomized design (CRD) consisting of two factors, temperature (125°C and 150°C) and time (2 hours, 3 hours, and 4 hours). The raw materials used in this study were teak plus wood and polyurethane adhesive with a coating weight of 160 g/m² and composition ratio of isocyanate : polyol (20:3). The testing of the quality of plus teak wood laminates included physical properties (moisture content, density, contact angle, and color change) and adhesive properties (delamination, shear bond strength, and percentage of wood failure).

The results of the study indicate that the interaction between temperature and heat modification time has a significant effect on delamination. Higher heat modification temperatures have a significant effect on increasing the contact angle and decreasing the density, shear strength, and percentage of wood failure. Heat treatment time has a significant effect on shear bond strength and the percentage of wood failure. The best physical and bonding properties of teak laminate were obtained from a treatment temperature of 125°C with a heat modification time of 2 hours, namely a 35.65% decrease in moisture content, a 2.55% decrease in density, contact angle of 67.06°, color change of 4.18 ΔE^* , delamination of 0%, shear strength of 4.41 MPa, and 71.27% wood failure.

Keywords: superior teak wood, temperature treatment, duration of treatment, physical properties, bonding properties

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