

Sifat Mekanik Komposit Epoksi/Serat Daun Nanas Subang Anyam dengan Variasi Orientasi Arah Serat yang Dipabrikasi dengan Metode Hand Lay-Up Diikuti Dengan Vacuum Bagging = Mechanical Properties of Woven Subang Pineapple Leaf Fiber/Epoxy with Fiber Orientation Variations, Fabricated by Hand Lay-Up Followed by Vacuum Bagging Methods

Randito Ananta Pratama, author

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Abstrak

Serat daun nanas bisa menjadi pengganti penggunaan serat sintetis dikarenakan sifatnya yang ramah lingkungan dan tersedia di Indonesia. Tujuan penelitian ini untuk memperoleh sifat mekanik papan komposit epoksi/serat daun nanas Subang dianyam. Komposit difabrikasi dengan variasi orientasi arah serat. Fabrikasi diawali dengan perlakuan alkali pada serat daun nanas Subang dan penganyaman. Fabrikasi komposit dengan metode hand lay-up kemudian diikuti dengan vacuum bagging. Hasil perhitungan densitas menunjukkan bahwa komposit epoksi/serat daun nanas Subang dengan orientasi arah $0^{\circ}/0^{\circ}/0^{\circ}/0^{\circ}$ dan $0^{\circ}/90^{\circ}/0^{\circ}/90^{\circ}$ termasuk dalam golongan papan serat kerapatan tinggi. Sifat Mekanik terbaik dimiliki oleh komposit epoksi/serat daun nanas Subang dengan orientasi arah serat $0^{\circ}/0^{\circ}/0^{\circ}/0^{\circ}$ yang memiliki kuat tarik sebesar $(93,82 \pm 22,48)$ MPa dan kuat lengkung sebesar $(109,57 \pm 8,11)$ MPa. Pengamatan dengan mikroskop optik menunjukkan bahwa serat daun nanas Subang dan epoksi menyatu dengan baik pada komposit epoksi/serat daun nanas Subang.

.....Pineapple leaf fiber can be a substitute for synthetic fiber's usage due to its eco-friendly nature and its availability in Indonesia. The purpose of this research was to obtain mechanical properties of Subang pineapple leaf fiber/epoxy composite board. The composite was fabricated with two fiber orientations. Fabrication was started by alkalization treatment towards the Subang's pineapple leaf's fiber. Composite fabrication was conducted by hand lay-up, followed by vacuum bagging method. The density measurement results showed that the composite Subang Pineapple Leaf Fiber / Epoxy with fiber orientation of $0^{\circ}/0^{\circ}/0^{\circ}/0^{\circ}$ and $0^{\circ}/90^{\circ}/0^{\circ}/90^{\circ}$ were categorized as high density boards. The best mechanical properties owned by Subang pineapple leaf fiber/epoxy composite with $0^{\circ}/0^{\circ}/0^{\circ}/0^{\circ}$ fiber orientation had tensile strength of $(93,82 \pm 22,48)$ MPa and flexural strength of $(109,57 \pm 8,11)$ MPa. The observation using optical microscope showed that the Subang pineapple leaf fiber and Epoxy had a strong interface.