ANALISIS KEKUATAN TARIK DAN LENTUR VARIASI *CHOPPED STRAND MAT* DAN SERAT *ABACA* SEBAGAI MATERIAL ALTERNATIF LAMBUNG KAPAL

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ABSTRAK

Penelitian ini menganalisis pengaruh variasi serat abaca terhadap kekuatan tarik dan lentur komposit hibrida serat abaca chopped dan E-glass chopped dengan matriks resin epoksi. Variasi yang digunakan adalah 0 gram, 3 gram, 5 gram, 7 gram, dan 10 gram serat abaca. Spesimen dibuat dengan metode hand lay-up dan diuji tarik sesuai ASTM D638 serta uji bending sesuai ASTM D790. Hasil pengujian menunjukkan bahwa variasi 5 gram serat abaca menghasilkan kekuatan tarik tertinggi dengan nilai rata-rata 77,33 MPa dan maksimum 85 MPa, serta kekuatan bending rata-rata 120 MPa dan maksimum 195 MPa. Penambahan serat di atas 5 gram justru menurunkan kekuatan akibat aglomerasi serat. Simulasi elemen hingga menghasilkan pola deformasi yang sesuai dengan teori mekanika material. Berdasarkan standar Biro Klasifikasi Indonesia yang mensyaratkan kekuatan tarik minimum 90-98 MPa, komposit yang dikembangkan belum memenuhi persyaratan tersebut

Kata Kunci**:** *komposit hibrida, serat abaca, kekuatan tarik, uji bending, simulasi elemen hingga.*

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ANALYSIS OF TENSILE AND FLEXIBLE STRENGTH OF VARIATIONS OF CHOPPED STRAND MAT AND ABACA FIBER AS ALTERNATIVE MATERIALS FOR SHIP HULLS

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ABSTRACT

This study analyzes the effect of abaca fiber variations on the tensile and flexural strength of hybrid composites of chopped abaca fiber and E-glass fiber with epoxy resin matrix. The variations used were 0 grams, 3 grams, 5 grams, 7 grams, and 10 grams of abaca fiber. Specimens were fabricated using the hand lay-up method and tested for tensile strength according to ASTM D638 and flexural strength according to ASTM D790. The test results showed that the 5-gram abaca fiber variation produced the highest tensile strength with an average value of 77.33 MPa and a maximum of 85 MPa, as well as an average flexural strength of 120 MPa and a maximum of 195 MPa. The addition of fiber above 5 grams actually decreased the strength due to fiber agglomeration. Finite element simulation produced deformation patterns that were consistent with the theory of material mechanics. Based on the Indonesian Classification Bureau standards which require a minimum tensile strength of 90-98 MPa, the developed composite has not met these requirements.

Keywords: *hybrid composite, abaca fiber, tensile strength, flexural test, finite element simulation*