

MECHANICAL CHARACTERISTIC OF COCONUT
COIR COMPOSITE TO BE USED FOR FENDER

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**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled:

MECHANICAL CHARACTERISTIC OF COCONUT COIR COMPOSITE TO BE USED FOR FENDER By **Mohd Sufian Bin Ibrahim**, Matric No. **UK 17480** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this thesis entitled **MECHANICAL CHARACTERISTIC OF COCONUT COIR COMPOSITE TO BE USED FOR FENDER** is the result of my own research except as cites in the references.

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MECHANICAL CHARACTERISTIC OF COCONUT COIR COMPOSITE TO BE USED FOR FENDER

ABSTRACT

Nowadays, new technologies develop fender systems to ensure safety ships and pier during berthing. The basic characteristics of the fender should depend from elasticity of the materials. The fenders will more efficient if a huge energy can absorb. In this study, the structural characteristics and mechanical properties of coir composites was evaluated. The results obtained for flexural strength will allow comparisons of the composites with other conventional materials in terms of the technical performance. Coir is the natural material from the husk of coconut and an alternative material other than natural rubber to be use in fender because of its absorption of collision characteristics. The coconut coir is assessed as an environmental friendly material owing to its biodegradability and renewable characteristics. The aim of this study is to determine the effectiveness of using coir in fender other than natural rubber. The few specimens was tested by mechanical test such as tensile test, bending test and impact test. Tensile test was carried out to determine the strength of material, while bending test is to obtain the maximum stress on the tension side of flexural and Impact test; it's to obtain the impact energy that can be absorbed. The results indicate that composite coir is 119.8 MPa for tensile stress, 38.73866 N for maximum flexure and 1.184 J for energy absorption.

KAJIAN MENGENAI SIFAT- SIFAT KOMPOSIT SABUT KELAPA UNTUK DIGUNAKAN TERHADAP DERMAGA

ABSTRAK

Pada masa kini, teknologi baru telah membangunkan sistem dermaga untuk memastikan keselamatan kapal-kapal dan dermaga itu sendiri agar tidak pecah atau rosak semasa berlabuh. Ciri-ciri asas dermaga yang seharusnya dibuat daripada bahan-bahan yang anjal dan mampu menyerap hentakan. Keberkesanan dermaga yang terbaik adalah apabila dapat menyerap hentakan yang lebih besar. Dalam kajian ini, ciri-ciri bahan dan struktur mekanikal komposit sabut kelapa akan ditentukan. Keputusan yang diperolehi bagi kekuatan lenturan akan membenarkan perbandingan rencam dengan bahan-bahan lain yang konvensional dari segi prestasi teknikal. Sabut kelapa adalah bahan semula jadi dari sekam kelapa dan merupakan salah satu alternatif lain selain daripada getah asli untuk digunakan dalam dermaga(fender) di sisi kapal kerana mempunyai ciri-ciri penyerapan perlanggaran. Sabut kelapa adalah salah satu bahan yang mesra alam, biodegradabiliti dan mempunyai ciri-ciri yang boleh diperbaharui. Tujuan kajian ini adalah untuk menentukan keberkesanan menggunakan sabut dalam fender selain daripada getah asli. Beberapa spesimen yang diuji dengan ujian mekanikal seperti ujian tegangan, ujian lenturan dan ujian penyerapan. Ujian tegangan telah dijalankan untuk menentukan kekuatan bahan, manakala ujian lenturan adalah untuk mendapatkan tegasan maksimum pada bahagian tegang lenturan dan ujian penyerapan; ia adalah untuk mendapatkan tenaga impak yang boleh diserap. Hasilnya menunjukkan bahawa sabut komposit adalah 119,8 MPa untuk tegasan tegangan, 38,73866 N untuk lenturan maksimum dan 1,184 J untuk tenaga penyerapan.