

PROPERTIES OF FIBERGLASS: STUDY ON STRENGTH
AND DURABILITY FOR HYDROLYSIS

AHMAD NAJMI BIN ABDUL ROHIM

FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

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Perpustakaan Sultanah Nur Zahirah
Universiti Malaysia Terengganu (UMT)

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PERPUSTAKAAN SULTANAH NUR ZAHIRAH
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21000 KUALA TERENGGANU

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**PROPERTIES OF FIBERGLASS: STUDY ON STRENGTH AND
DURABILITY FOR HYDROLYSIS**

**By
AHMAD NAJMI BIN ABDUL ROHIM**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
THE REQUIREMENTS FOR AWARD OF THE DEGREE OF
BACHELOR OF APPLIED SCIENCE (MARITIME TECHNOLOGY)**

**DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU
2012**



**DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU**

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

It is hereby declared and verified that this research report entitled:
**PROPERTIES OF FIBERGLASS: STUDY ON STRENGTH AND DURABILITY FOR
HYDROLYSIS** by **AHMAD NAJMI BIN ABDUL ROHIM**, Matric No. **UK 18020** has 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 OF APPLIED SCIENCE (MARITIME TECHNOLOGY)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

Verified by:

Ferry Manuhutu
.....

Principal Supervisor

Name: **IR. FERRY MANUHUTU**

FERRY MANUHUTU
JABATAN TEKNOLOGI MARITIM
FAKULTI PENGAJIAN MARITIM DAN SAINS MARIN
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

Official stamp:

Date: *21/06/2012*
.....

Mohammad Fadhl bin Ahmad
.....

Head of Department of Maritime Technology

Name: **PROF. MADYA DR. MOHAMMAD FADHLI BIN AHMAD**

Official stamp:

Date: *21/6/12*
.....

ASSOC.PROF. DR. MOHAMMAD FADHLI AHMAD
HEAD
DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

DECLARATION

I hereby declare that this thesis entitled PROPERTIES OF FIBERGLASS: STUDY ON STRENGTH AND DURABILITY FOR HYDROLYSIS is the result of my own research except as cited in the references.

Signature : 

Name : AHMAD NAJMI BIN ABDUL ROHIM

Matrix No. : UK 18020

Date : 20 June 2012

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Properties of Fiberglass: Study on Strength and Durability for Hydrolysis.

ABSTRACT

This study is to carry out the answer of question on the effect of hydrolysis to fibreglass. This study provides the information of strength, flexural and weight changing after fibreglass has been immersed in seawater. From previous study, the weight of fibreglass is increase othewise the strength and the flexural are decreasing due to exposure to seawater (Grami, 2009). This study has two main objectives. The first one is to understand the effect of seawater to the specimen strength. The second objective is to define the effectiveness of gel coat applied on the fiberglass to protect it from hydrolysis. For this study, 93 pieces of FRP specimen had been prepared. They had been grouping in five groups. Each group will have two groups, one group had been prepared for tensile test and another group will be preparing for 3-point bending test. Each test had been used three pieces. All the specimens are immersed in seawater in room condition. This experiment has taken 56 days to complete. The specimens had been tested by using two method of test. The first test is tensile test. This test will be showing the differences in strength. The second test is three point bending test. This test will be showing the effect of hydrolysis to the flexural of the specimen. Immersion into the seawater could affect the tensile strength and flexural strength of fibre reinforce polymer (FRP). The penetrated seawater could also increase the weight of FRP after being immersed for a long period into the seawater. Using the gel coat as a defence element from seawater is necessary. The gel coat could protect the FRP but it's not 100% effective, because the seawater still penetrates into this type of material. Increasing of gel coat thickness could decrease the effect of hydrolysis.

Ciri-Ciri Kaca Gentian: Kajian Mengenai Kekuatan Dan Ketahanan Untuk Hidrolisis.

ABSTRAK

Kajian ini adalah bertujuan untuk menjawab persoalan mengenai kesan hidrolisis keatas gentian kaca. Kajian ini akan menyediakan maklumat mengenai kekuatan, daya lenturan dan perubahan berat selepas gentian di rendam di dalam air laut. Melalui kajian yang telah dijalankan, berat gentian kaca akan bertambah manakala kekuatan dan daya lenturan akan berkurangan akibat dedahan terhadap air laut (Grami, 2009). Kajian ini mempunyai dua objektif. Objektif pertama adalah untuk memahami kesan air laut terhadap kekuatan bahan kajian. Manakala objektif yang kedua adalah untuk memahami keberkesanan aplikasi gel coat terhadap gentian kaca bagi melindunginya daripada hidrolisis. Untuk kajian ini, 93 keping specimen telah disediakan. Specimen-specimen tersebut telah dibahagikan kepada lima kumpulan. Setiap kumpulan akan mengandungi dua kumpulan. Satu daripanya adalah untuk ujian tegangan, manakala satu lagi adalah untuk ujian tiga titik lenturan. Setiap ujian akan mengandungi tiga keping specimen. Kesemua specimen tersebut akan direndam didalam air laut didalam suhu bilik. Kajian ini akan dijalan selama 56 hari. Speimen-specimen tersebut diuji dengan ujian tegangan adalah untuk menentukan perbezaan kekuatan sepanjang kajian dijalankan. Ujian tiga titik lenturan dijalankan untuk menentukan perbezaan daya lenturan speimen-specimen sepanjang kajian dijalankan. Speanjang ujian dijalankan, air laut yang telah diserap akan meningkatkan berat FRP apabila direndam di dalam air laut untuk jangka masa yang lama. Manakala penggunaan gel coat sebagai perlindungan daripada air laut adalah diperlukan. Penggunaan gel coat tidak dapat melindungi FRP secara total atas kerana air laut tetap berkebolehan untuk menyerap kedalam bahan tersebut. Peningkatan ketebalan gel coat akan menurunkan kesan hidrolisis.