

THE STUDY OF BIOFUEL FOR MARINE APPLICATION AND THE  
IMPACT TOWARDS EMISSION FOR BETTER  
ENVIRONMENT

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**THE STUDY OF BIOFUEL FOR MARINE APPLICATION AND THE IMPACT  
TOWARDS EMISSION FOR BETTER ENVIRONMENT**

**By**

**AHMAD FUAD BIN MOHD HAMDIN**

**A thesis submitted in partial fulfilment of  
the requirement for the award of degree of  
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**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCES  
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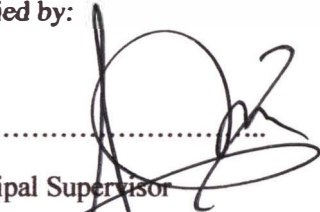


**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE**

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

It is hereby declared and verified that this research report entitled:  
**THE STUDY OF BIOFUEL FOR MARINE APPLICATION AND THE IMPACT TOWARDS EMISSION FOR BETTER ENVIRONMENT** by **AHMAD FUAD BIN MOHD HAMDIN**, Matric No. **UK 19003** 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 OF APPLIED SCIENCE (MARITIME TECHNOLOGY)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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## DECLARATION

I hereby declaration that this thesis entitled the study of biofuel for marine application and the impact towards emission for better environment is the result of my own research except as cited in the references.

Signature :  .....

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## **THE STUDY OF BIOFUEL FOR MARINE APPLICATION AND THE IMPACT TOWARDS EMISSION FOR BETTER ENVIRONMENT.**

### **ABSTRACT**

The increase of air pollution levels forcing the scientists to analyze the appropriate alternative fuel in dealing with pollution problems. Among the suitable alternative fuels is bio-fuel to replace petroleum fuels to reduce air pollution and the popular bio-fuel is biodiesel. Many studies were conducted on biodiesel, and all of these studies show similar results which is reduce air pollution compared to petroleum use. However, biodiesel available in the market today still produce pollutants, the cost of bio-fuel production is expensive and the process is complicated. This study was looked at the emission behavior produced by diesel, marketable biodiesel, and a new generation of biodiesel that made by palm carcass, which are focusing on the production of smoke thickness, hydrocarbon (HC), carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), carbon monoxide (CO), and nitrogen oxide (NO<sub>x</sub>). The result shows that palm carcass biodiesel (BD20) performed better emission compared with diesel. However, the production of nitrogen oxide (NO<sub>x</sub>) from biodiesel increased compared with diesel emission.

# **KAJIAN BAHAN API BIO UNTUK PENGGUNAAN MARIN DAN KESANNYA TERHADAP PELEPASAN GAS UNTUK ALAM SEKITAR YANG LEBIH BAIK.**

## **ABSTRAK**

Kadar pencemaran udara yang semakin meningkat memaksa para pengkaji untuk menganalisis bahan api bio yang sesuai dalam menangani masalah pencemaran. Antara bahan api alternatif yang sesuai untuk menggantikan bahan api petroleum untuk mengurangkan pencemaran udara adalah biodiesel. Banyak kajian mengenai biodiesel telah dijalankan, dan kesemua kajian tersebut menunjukkan hasil yang sama, iaitu mampu mengurangkan pencemaran udara berbanding penggunaan bahan api petroleum. Walaubagaimanapun, biodiesel yang terdapat dalam pasaran sekarang masih menghasilkan bahan pencemar, kos bahan api bio yang mahal dan cara penghasilan yang rumit. Kajian ini, telah melihat corak pembebasan gas hasil pembakaran diesel, biodiesel dan biodiesel baru yang diperbuat daripada pelepah sawit, di mana kajian akan bertumpu kepada pembebasan gas seperti hidrokarbon (HC), karbon dioksida (CO<sub>2</sub>), oksigen (O<sub>2</sub>), karbon monoksida (CO), dan nitrogen dioksida (NO<sub>x</sub>). Keputusan menunjukkan biodiesel daripada pelepah sawit (BD20) menghasilkan kurang pencemaran berbanding diesel. Walaubagaimanapun, nitrogen oksida (NO<sub>x</sub>) daripada biodiesel meningkat berbanding diesel.