

CORROSION BEHAVIOUR OF ZINC COATED STEEL IN  
SEAWATER

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**CORROSION BEHAVIOUR OF ZINC COATED STEEL IN SEAWATER.**

**BY**

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**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF  
THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF  
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**DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDY AND MARINE SCIENCE  
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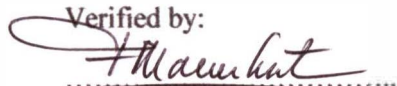


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**DECLARATION AND VERIFICATION REPORT  
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: **CORROSION BEHAVIOUR OF ZINC COATED STEEL IN SEAWATER** by **NURUL ASYIKIN BINTI ISHAK**, Matric No. **UK 17615** 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 Degree of **BACHELOR 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 **CORROSION BEHAVIOUR OF ZINC COATED STEEL IN SEAWATER** is the result of my own research except as cited in the references.

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### **This project report should be cited as :**

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## **CORROSION BEHAVIOUR OF ZINC COATED STEEL IN SEAWATER**

### **ABSTRACT**

This study investigated the performance of zinc coating as corrosion prevention for mild steel. Mild steel is the most versatile, least expensive and widely used but it is easily corrode when expose to aggressive environment like seawater. The objectives of this study are to know the effect of zinc coating towards rate of corrosion of mild steel in seawater and the effect of zinc coating toward corrosion of steel. In this review, reports the results of weight loss analysis, impedance analysis, morphology and surface analysis and lastly, the rate of corrosion of sample. The samples used in this study were fully zinc coated steel, zinc coated steel with scratch and mild steel as a control. The metals were immersed in seawater at room temperature for 40 days with 10 days time intervals of characterization test. The results show that the corrosion rate of fully zinc coated steel decrease with time exposure from 0.03 mm/y to 0.01 mm/y and for zinc coated steel with scratch, from 0.034 mm/y to 0.012 mm/y. Furthermore, the result obtained from the impedance analysis, the resistance of samples increase with the time exposure. The findings reveal that the minimal rise in weight for fully zinc coated steel and zinc coated steel with scratch. Lastly, the results obtained lead to the conclusion that zinc coating is effective as corrosion protection for steel even with a presence of cut edge or scratch.

## **CORROSION BEHAVIOUR OF ZINC COATED STEEL IN SEAWATER**

### **ABSTRAK**

Kajian ini menyiasat tentang keupayaan salutan zinc sebagai pencegahan kakisan keluli lembut. Keluli lembut adalah yang paling versatile, kurang mahal dan digunakan secara meluas tetapi ia mudah menghakis apabila terdedah kepada persekitaran yang agresif seperti air laut. Objectik kajian ini adalah untuk mengetahui kesan salutan zinc terhadap kadar kakisan keluli lembut dalam air laut dan kesan daripada salutan zinc terhadap pengurangan berat keluli lembut. Dalam kajian ini melaporkan keputusan penurunan berat, analisis impedans, morfologi dan analisis permukaan dan akhir sekali, kadar kakisan sampel. Sample yang digunakan dalam kajian ini adalah keluli bersalut sepenuhnya dengan zinc, keluli bersalut zinc dengan gores dipermukaannya, dan keluli lembut sebagai kawalan. Logam direndam didalam air laut pada suhu bilik selama 40 hari dan dengan 10 hari selang masa ujian pencirian. Keputusan menunjukkan bahawa kadar kakisan keluli bersalut zinc sepenuhnya berkurang daripada 0.03 mm/y kepada 0.01 mm.y dan keluli bersalut zinc dengan gores dari 0.034 mm/y kepada 0.012 mm/y. tambahan pula, keputusan yang diperolehi daripada analisis impedans, rintangan sampel meningkat dengan masa rendaman sampel. Kajian ini menunjukkan kenaikan minimum berat untuk keluli bersalut zinc sepenuhnya dan keluli bersalut zinc dengan gores. Akhir sekali, keputusan yang diperolehi membawa kepada kesimpulan bahawa salutan zinc adalah berkesan sebagai perlindungan kepada kakisan keluli walaupun dengan kehadiran gores atau calar.