

STUDY OF POSSIBLE FIRE DOOR MATERIALS MADE FROM ALTERNATIVE WASTE  
ITEMS

by

MOHD AMIRUL FIKRI BIN ABDUL RANI

DISSERTATION

Submitted in partial fulfillment of  
the requirements for the  
Bachelor of Engineering (Hons)  
(Mechanical Engineering)

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**CERTIFICATION OF APPROVAL**

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Approved by,

.....  
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May 2013

## **CERTIFICATION OF ORIGINALITY**

This is to certify that I am responsible for the work submitted in this particular project, whereas the project is on my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

.....  
MOHD AMIRUL FIKRI BIN ABDUL RANI

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## **ABSTRACT**

The objective of this project is to study any possible material from waste item to be used as one of fire door element. Under this research, five composite plates were fabricated using waste sawdust as filler and Portland cement as inorganic binder. The composite plates were fabricated without using any specialized equipment, heat or pressure, which is producing an environmentally conscious composite material. Several of the plates were added with additive to create a high fire resistance composite of material. The influence of binder content and type of additive on the thermal insulating behavior is investigated using fire resistance test where the plates are exposed to constant temperature of 950 °C for 60 minutes duration. The results from the research shows that the composite plates produced are not suitable to replace the uses of wood in fire door making due to its fire resistance lower compared to wood.

Keywords: composite, sawdust, Portland cement, fire resistance