

UNIVERSITI TEKNOLOGI MARA

**THE PHYSICAL AND MECHANICAL
PROPERTIES OF RICE HUSK/ RECYCLED
PLASTICISED POLYVINYL CHLORIDE
COMPRESSION MOULDED COMPOSITE AT
VARIOUS FILLER LOADINGS AND PARTICLE
SIZES**

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Thesis submitted in fulfilment
of the requirements for the degree of
Master of Science

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Wood plastic composite is a combination of natural filler and plastic, thus it presents the properties of these two materials. The waste of natural filler and plastic were creating lots of problem to the environment and human health. Thus the research was performed to re-use the waste and value the added materials. In this study, recycled plasticised polyvinyl chloride and rice husk flour which is different in loading and particle size was fabricated using compression moulding method. The different in particle sizes and loadings was to confirm the best particle size and amount of natural filler that suit the composite using this method. The composite was tested to evaluate the physical and mechanical properties. The testing was such as water absorption test, density test, tensile test, three points bending test, drop weight impact test, and scanning electron microscopy to determine fracture behaviour of the composite. It was found that the composite with the lowest rice husk loading which is 20 % w/w with larger rice husk's particle size which is more than 100 μm gives the optimised properties compare to other composite with highest rice husk loading and smaller rice husk's particle size. The sample shows the lowest water absorption properties with the density at 1.26 g/cm^3 . While the tensile properties such as tensile strength, elongation at break, and Young's modulus was at 21.84 MPa, 2.38 %, and 1.01 GPa respectively. The flexural properties was presented by flexural strength, flexural modulus, and flexural strain, which was at 40.92 MPa, 2.15 GPa, and 2.76 % respectively. While the impact strength and impact energy was at 5.97 MPa, and 2.11 J/m^2 respectively. This suggest that rice husk/ recycled plasticised polyvinyl chloride composite is more valuable at the low rice husk loading with larger rice husk's particle size. However, the properties seem to be lower than pure recycle Plasticised Polyvinyl Chloride.

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