UNIVERSITI TEKNOLOGI MARA

MECHANICAL PROPERTIES OF HYBRID PLYWOOD FROM COCONUT TRUNK AND RUBBERWOOD

MOHD KHAIRUL NIZAM BIN TAPAK

Thesis submitted in fulfillment of the requirements
for the degree of
Bachelor of Sciences (Hons.) in Furniture Technology

Faculty of Applied Sciences

May 2011

MECHANICAL PROPERTIES OF HYBRID PLYWOOD FROM COCONUT VENEER WITH RUBBERWOOD

ABSTRACT

Plywood is a panel product composed of three or more thin layers of wood that are glued together one or more veneers to perpendicular for both side of a veneer and united under high temperature and pressure. The shortage of wood as a raw material has recently become a great concern. Therefore, wood-based industries must find alternative sources of local raw materials, and coconut tree currently appears to be an alternative source for substitute. The coconut, *Cocos nucifera* L., has been proven to be a good substitute for many conventional woods. Like conventional wood, the coconut stem is durable, sturdy and versatile and can often be used at a considerably lower cost. The cost of coconut wood is only about half or a little more than half the price of conventional wood traditionally used for structural purposes This study investigated the effects of plywood (coconut, hybrid and rubberwood) and spread level on the mechanical and water resistant properties of different types of plywood. The measured mechanical properties include tensile strength (TS), modulus of rupture (MOR) and modulus of elasticity (MOE). Water absorption and thickness swelling were tested to evaluate the water resistance properties. The plywood made from rubberwood give higher quality compare to the plywood made from hybrid coconut with plywood and plywood made from coconut. The plywood made from spread level 360 g/m^2 PF resin had lower qualities than the plywood made from spread level 180 g/m^2 PF resin The quality of plywood was decrease as the spread level of PF increase. The results indicated that the bond between spread level 360 g/m^2 of PF and veneer is over to tight and becomes less bond because too much resin content. The water absorption and thickness swelling presence resulted in higher water resistance related to the mechanical properties. The plywood made from hybrid had potential as an appropriate material for plywood manufacturing.

ACKNOWLEDGEMENTS

All praises and thanks be to Allah (S.W.T), who has guided us to this, never could we have found guidance, were it not that Allah had guided us!(Q7:43).

I wish to acknowledgement that I am indebted to many people for the countless hours of hard work, dedication and support, without which this study could not have been completed. Special recognition and appreciate are expressed to the person name below.

First and foremost, to Dr. Wan Mohd Nazri bin Wan Abd Rahman as my main advisor and Madam Siti Norbaini bte Sarmin as my second advisor. Without the guidance from them I would not been able to finish my project and doing writing thesis. I want to say thank a lot because who always provided the necessary support, guidance and encouragement to complete final project paper. A special appreciation to to Prof Madya Zulkifli because teach me how to use SPSS software. Who has helped me in completed this project I want to say thank too. Thanks for your support and ideas.

Thanks to Mr. Sardi and Mr. Shahril for his untiring leadership, profound concern interest in seeing that this final project paper was complete.

Finally, for someone very special in my heart who always gives support and advice and to all my friends, your support and advices throughout completing this final project paper.

TABLE OF CONTENTS

CONTENTS