

CELEBRATING
COMMERCIALISATION
YEAR 2014

iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention
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exposition 2014

INNOVATEUR
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2014

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UNIVERSITI TEKNOLOGI MARA
MALAYSIA

*Bridging
the valley of death :
advancing the
commercialisation
of research*

RESEARCH BOOK

iiindex2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

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FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed
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MOULDED ROVBAM (ROTARY VENEER FROM BAMBOO) CHAIR

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Moulded Rotary Veneer Bamboo (RoVBAM) was laminated with wood veneers to produce chair. *Dendrocalamus asper* (Buluh Betong) and wood species namely Sesenduk (*Endospermum diadenum*) were chosen for this project. Sesenduk is a pioneer wood species which is defined as the first adaptable and vigorous flora to colonize disturbed or damaged ecosystems where they are grown fast, developing small diameter trees. It is anticipated that peeling can be done for small diameter log of 3 inches to 8 inches diameter using a peeler lathe. Thus this study will explore the new potential of small diameter wood species to be converted to veneer. The intention to produce bamboo-wood hybrid are to obtain mauled product which possessed high strength to weight ratio, high flexural and light weight for interior application. Both bamboo and pioneer wood are environmentally benign and renewable. Bamboo grows ten times faster to maturity than wood, thus bamboo is considered as a rapidly renewable resource, which has environmental advantages over long-cycle renewable resources. Despite the advantage, bamboo was utilized only for simple ware making for a long time. In recent years, bamboo has increasingly been exploited in engineering designs of the western world. It is more and more frequently used in applications which traditionally have not taken advantage of the exceptional properties of this material, for economic reasons as well its eco-efficiency and technical merits. What initially started with an increasing availability and diversity of bamboo kitchen implements, garden tools, and pieces of sports equipment, has progressed to more complex technical applications. A number of bamboo bicycles of different styles and designs are now commercially available, and wind turbine blades made from bamboo veneer are currently being tested. Material wise, the bamboo were obtained from scattered area of Sungkai, Perak and from a plantation area at Pedas, Negeri Sembilan. Bamboo with diameter of 80 mm to 200 mm and wall thickness of 25 mm to 42 mm were used. The bamboos were delivered to Kin Heng Timber Industries Sdn. Bhd. in Chemor, Perak to be rotary peeled into veneers. The veneer recovery generated from the peeling process is between 43 - 54% and the thickness of veneer is between 0.6 - 0.7 mm. The width of the veneer produced was 686 mm and the length would depend on the product design requirement and mould. The veneers were dried to 8 - 10% of moisture content prior to product development. Three (3) layers of veneer along the grain were arranged and laminated using Urea Formaldehyde (UF) resin. It is then sanded to obtain smooth surface to be used as the top and bottom layers for the chair. Seven (7) plies of wood veneers with thickness of 1.2mm were used as the core. The two components were then hot-pressed at 1000 psi, 1000 C for 13 minutes. The total thickness of the moulded chair is ± 12 mm. The finished moulded chair was then tested at the Furniture Testing Laboratory in FRIM based on BS EN 12520:2010: Furniture strength, durability & safety, requirement for domestic seating. The test results showed that the moulded chair has met and fulfilled the minimum standard requirement.