

# Method Of Producing Woven Oil Palm Composite From Oil Palm Trunk

PATENT NO. PI 2021000174



## BRIEF TECHNOLOGY

- The invention relates to the **production of composites from natural biomass**. More particularly, the present invention relates to a method of manufacturing a woven composite **from oil palm-based heartwood and softwood**.

## CURRENT ISSUES

- The exploration on the use of oil palm biomass for conversion to bio-composite material as supplement to tropical and rubber wood have been conducted since the 1990s.
- Plywood, oil palm particleboard and medium density fiberboard from oil palm trunk (OPT) generally meet the Japanese Agriculture Standard (JAS) in terms of mechanical properties and bonding, but not in the case of dimensional stability particularly due to thickness swelling.
- The thickness swelling of oil palm plywood, particleboard and medium density fiberboard is more than 12% even with high percentage of resin usage.
- Amid low consumption of oil palm veneer used in plywood, an approach to impregnate with a low molecular weight phenol formaldehyde resin for surface and property enhancement has been carried out.

## INVENTIVENESS & NOVELTY

- Weaving oil palm veneer strips to form a plurality of woven layers.
- Soaking the plurality of woven layers in a resin; air drying the resin-soaked woven layers; applying an adhesive and stacking the resin-soaked woven layers.
- Cold pressing the woven oil palm composite
- Hot pressing the woven oil palm composite

## USEFULNESS & APPLICATION

- The woven oil palm veneer cured with low molecular weight of phenol formaldehyde (LMPF) enhance the dimensional stability mechanical properties, decay and termite resistances of the sandwich composite.
- It is suitable as indoor and outdoor structural applications such as decking, wall paneling, beam, I-joist, cladding, concrete molding, door, window, flooring for bus, truck, container and boat, temporary shelter house, caravan and furniture.

## IMPACT OF THE PRODUCT

- A lowest thickness swelling of 3.02% after 4 cycles (4 weeks) water soaking/oven dry test.
- The modulus of rupture (MoR) is 15 MPa.
- The internal bond is 118 MPa.
- The durability is class 1 against the white and brown rot fungi according to EN 113.
- The weight loss after termite test is 8.5 % as compared to the untreated oil palm sandwich composite (19.2 %) according to AWPA (E1-17).
- Suitable for outdoor application.

## MARKET POTENTIAL

- Malaysia and worldwide market:
- House and building industry.
- IKEA furniture and interior design .
- Container industry.
- Public consumer – general usage.

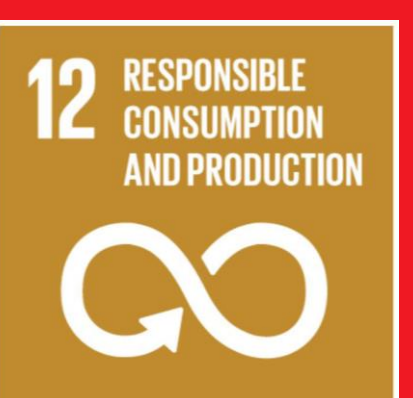
## Technology Readiness Level (TRL)

9 - Product /System proven



Project Leader : Assoc. Prof. Dr. Norul Hisham Hamid  
Dept./Faculty : Wood and Fibre, Faculty of Forestry and Environment  
Email : h\_noroul@upm.edu.my  
Phone : 011-59494880  
Expertise : Sustainable Biocomposite & Non-Wood Forest Products

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