

The Biomass Technology Centre (BTC) is a one-stop centre for R&D in bio-composites from oil palm biomass, especially medium density fibre-board (MDF). The MDF pilot plant has quality control and testing laboratories and also facilities for processing wood-based bio-composites. BTC has the expertise and facilities to provide assistance and strategic technical support to producers of wood-based panels. Operated by trained personnel specializing in wood-based R&D, the MDF pilot plant is able to produce a variety of wood-based panels and other products, similar to those already produced by the industry. Wood-based producers can use this pilot plant to carry out their R&D for commercialization, assisted by experienced MPOB personnel in the technical and quality control of the processes.

## ADVANTAGES OF MDF PILOT PLANT SERVICES

The MDF pilot plant is specifically designed to test production processes and production requirements in an accurate, small-scale simulation to reveal the bottle-necks and other unexpected problems for rectification before actual production starts. The equipment available is very advanced, and can closely simulate the actual production conditions in a real industrial plant. Along with evaluating the process parameters such as glue and additives contents, the pilot plant can also produce small batches of the product for analysis and test marketing. Besides, it can also provide training for future plant operators and technical assistance to the entrepreneurs. In addition to MDF, the plant can also produce other products, such as pulp and paper and oriented strand board (OSB).

The MDF pilot plant offers technical service for a broad range of R&D activities for the wood-based industry. Some examples are:

- defibration of different fibres, such as oil palm biomass and kenaf;
- evaluation of mechanical and physical strength, non-destructive tests (NDT) and formaldehyde emission of different raw materials, resin systems and process conditions for refining and hot pressing;
- defibration process optimization, energy reduction and mass-energy balance such as evaluation of different refiner plate patterns and refining process settings;
- performance testing of adhesive systems and materials by the panel properties; and
- evaluation of regenerative materials for manufacture of wood-based composite panels.

## PILOT PLANT FACILITIES

The MDF pilot plant is equipped with all the latest equipment and technology in the world, including a pressurized refiner, glue blender, tube dryer, former and pressing system (Figure 1). The pressurized refiner has a 366 cm (12")



Figure 1. Pressurized refiner system.

diameter refiner disc and is powered by a motor with variable speed up to 5000 rpm. The refiner system can stand steam pressure of up to 10 bar. Production capacity is between 20 to 100 kg hr<sup>-1</sup> depending on the process conditions, type of material and refiner plate used. The resin can be injected through the blow-line resin injection system which gives better glue penetration to the fibre surface with small droplets of glue atomized, improving the binding and strength of the board produced. Multi variable setting of the Diffenbacher press equipped with an automatic control system is used to produce multi wood-based panels. The platen size is 1200 mm x 1600 mm and is heated with thermo oil. The temperature of the platen can be set from 0°C to 220°C with a programmable pressing cycle (Figure 2).



Figure 2. Hot press for panel preparation.

The trial run process data can be collected and analysed for the product results, and subsequently used to design a scaled-up system, such as one with an Image Analyzer, Formaldehyde Emission WKI 1 m<sup>3</sup> chamber, mechanical testing Zwick 10KN & Lloyd-20KN, heat aging and cycle humidity chamber and pulp fibre analyser (Figure 3). The quality control section is also equipped with a Vertical X-ray Density Profiler Machine for density profiling of composites.



Mechanical testing  
Zwick 10KN



Heat ageing and cycle  
humidity chamber



Mechanical testing  
Lloyd-20KN



Pulp fibre analyser

Figure 3. Testing and quality control equipment in MDF pilot plant.

The MDF pilot plant offers its service on written request stating the test(s) required and specific conditions to run the test(s). A report will be prepared summarizing the work and test results.



Image analyser



Formaldehyde emission  
WKI 1 m<sup>3</sup> chamber

For more information kindly contact:

Director-General  
MPOB  
P. O. Box 10620  
50720 Kuala Lumpur, Malaysia.  
Tel: 03-87694400  
Website: [www.mpob.gov.my](http://www.mpob.gov.my)  
Telefax: 03-89259446