

Medium scale pilot plant facilities for production of palm-based polyols with a total capacity of 150 litres is now available in MPOB. Polyols for polyurethane industry could be produced from a wide range of palm-based feedstock of different iodine values using this system. The iodine value of a feedstock tells us the ratio of reactants that are required for epoxidation. The iodine value of a feedstock also tells us how extensive the reaction heat needs to be controlled that will prevent any runaway reactions. It is actually the design of the heat exchanger that determines how efficient one can control the heat loss and heat transfer of a process. For the epoxidation and alcoholysis processes to produce polyols, several washing steps are needed to neutralise and remove spent acids. A commercial logistic for waste water treatment has been installed to assist in waste water treatment management. An efficient moisture droplet removal system has also been integrated in the system to assist in removal of water or moisture up to 99%.

Based on years of research and development for the production of various palm-based polyols, MPOB has patented a process of producing palm-based polyol in Malaysia (MY-114189-80), Singapore (55223) and Indonesia (ID0017503). The improved method of production of palm-based polyols was granted a US patent (US 7,932,409) in 2011. This integrated system solves the problems of reaction heat control and waste water discharge plus removal of moisture from the produced polyols. The system has been tested on the production of polyols from RBD palm olein and palm kernel olein.

In MPOB, the medium scale pilot plant will mainly be used and designed as one of pre-commercial activities in the effort to commercialise a product or technology. A technology could not be efficiently transferred to the industry if this study at a medium scale pilot plant is not demonstrated

to industry members. Feedback from users or clients is essential when developing a technology at a commercial scale. We, therefore, will offer the Medium Scale Pilot Plant (150 litres volume) as a service to the industry within the scope of polyol production.

The objectives of this Transfer of Service (TOS) are:

- to provide a facility for economic analysis and process optimisation study;
- to provide a manufacturing facility for medium scale production or pre-commercial study of palm-based polyols; and
- to facilitate value addition activities for palm-based oleochemicals.

FACILITY AND EQUIPMENT



Figure 1. The 150 litres polyol pilot plant.

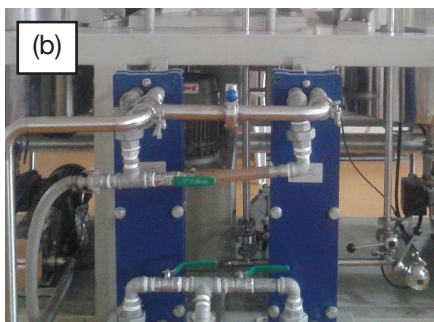


Figure 2. (a) Internal cooling coil and (b) plate heat exchanger cooling systems.

BENEFITS

- Facilities for economic analysis and pre-commercialisation trials for palm-based polyol manufacturing.
- Process optimisation and development of best manufacturing practices protocol.
- Availability of trained personnel to advice on running of the process.

INDICATIVE RENTAL FEE

The medium scale palm-based polyol manufacturing facilities are offered for rental. The rental fee is RM 1000 per day (eight working hours and subject to change).

ECONOMIC ANALYSIS

The medium scale palm-based pilot plant is not feasible for mass production because of the small volume of production per batch.

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