

PRODUCTION TECHNOLOGY OF BIODIESEL FROM PALM FATTY ACID DISTILLATE (PFAD)

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Palm fatty acid distillate (PFAD) is a by-product produced from the physical refining of palm oil. PFAD has been used in the soap-making industry, as an animal feed ingredient and as raw material for the oleochemical industry. In 2008, Malaysian refineries produced 750 000 t of PFAD. In the past, PFAD was sold at a discounted price to RBDPO (refined, bleached and deodorized palm oil) at a difference of USD 200 – USD 250 t⁻¹ (FOB). The bulk of the PFAD produced in Malaysia is exported.

The price fluctuation for biodiesel in recent years has prompted biodiesel producers to search for more economical alternative raw materials for biodiesel production. These include RBD palm stearin, PFAD and sludge oil. As compared to RBD palm oil and palm stearin, PFAD has a higher free fatty acid content (FFA of 70%-90%) which requires additional facilities to be incorporated into the existing biodiesel plant to process such high FFA oils. Knowing the restriction in raw material selection for most biodiesel plants in the country, MPOB has developed a process to produce palm biodiesel from PFAD which may help the producers to lower their production costs. Figure 1 shows a sample of the palm biodiesel produced from PFAD.



Figure 1. Palm biodiesel from palm fatty acid distillate (PFAD).

The process flow diagram for a PFAD biodiesel plant is shown in Figure 2.

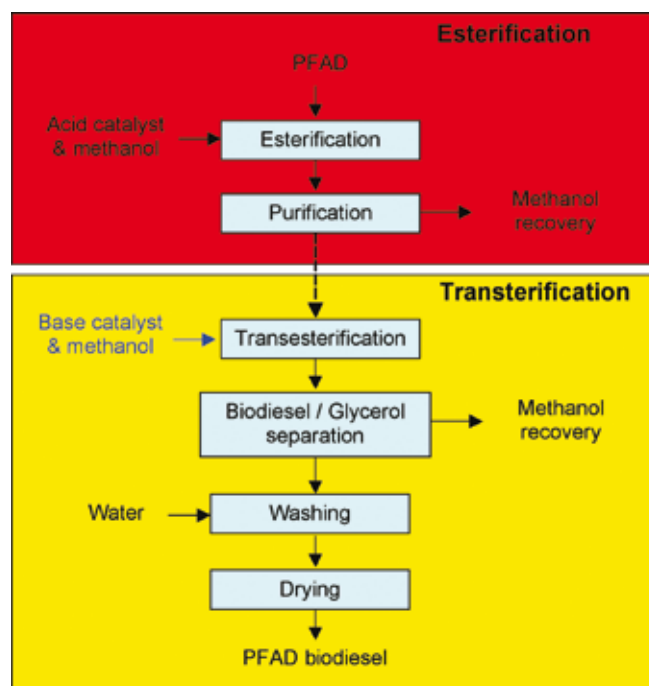


Figure 2. Process flow diagram for PFAD biodiesel production technology.

TECHNOLOGY

PFAD is esterified in the presence of a mild acid catalyst and methanol. The glycerol phase is decanted, and methanol is recovered from the methyl ester phase. The methyl ester produced is neutralised and subjected to moisture removal.

PRODUCT SPECIFICATION

The PFAD biodiesel produced meets with the European Biodiesel Standard EN 14214.



COST ESTIMATE

The cost for integrating an esterification plant into a pre-existing biodiesel plant depends on the

available facilities on-site. The estimated cost for a 200- to 400-t day⁻¹ esterification plant ranges from RM 2.5 million to RM 5.0 million.

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