

# Bio-Diesel Production



Bio-Diesel is a renewable fuel produced from the vegetable oils of plants such as rapeseed & sunflower. With only slight modifications to an existing oil fired boiler it can be used as an efficient heating oil or can be used as an environmentally friendly transport fuel alternative, either neat or blended with mineral fuel oil / kerosene.

Currently the majority of production in the UK takes place at a 'home-brew' scale, in small batch processes involving a series of vessels, chemicals, sampling processes and checks. The production process requires handling of hot fluids between tanks, vessels and filters which require a reasonably large area. With demand for bio-fuels increasing there is pressure for a more efficient methods and larger scale production.

*The POD*, a 450 litre self contained process reactor, confines the production process to a single unit that can be housed in an area no larger than a standard garage and makes bio-diesel production a cleaner, safer and environmentally compliant process.

It is ergonomically designed with aesthetics in mind and has a high thermal efficiency, yield and operational durability.

Adapted from petrochemical engineering technology a vortex assembly is integral to *The POD*, enhancing production yield whilst reducing operation time, a key consideration, whether this is a business or a private production venture.

*The POD* holds a unique market position being a highly insulated, high thermal efficiency, IP68 rated, polished stainless steel reactor with premium grade ATEX approved hardware and digital temperature, pressure and load control-display.

Capable of producing 450 litres of bio-diesel per batch and able to process a batch every 30 minutes, it is ideal as a small scale production unit for self sufficiency at business sites such as fleet operations, or as part of a larger scale manufacturing system to serve the growing bio-fuel supply industry.

*The POD* handles all elements of the Bio-Diesel production process.

- The methoxide transesterification catalyst is synthesized by mixing methanol and either potassium or sodium hydroxide together under atmospheric pressure.
- Transesterification proceeds to completion under pressure at 85°C and a small proportion of the oil is converted literally into soap via reactions between the available water, free fatty acids and catalyst. Separation occurs under gravity and the heavy glycerine is extracted from the reactor core, which can be sold for further refining.
- The lighter bio-diesel fuel contains low levels of methanol, sodium or potassium in variable proportions. Refining this ester phase with de-ionised water removes these superfluous materials leaving the fuel bright and clear.
- Drying is achieved by evacuating the reactor under high vacuum whilst maintaining the fluids internal temperature by electrical heating. This operation helps up-grade the fuels chemical characteristics including the flash point.

Whether you are considering a small scale production operation or a commercial production venture, *The POD* is the answer and can get you started in this exciting, worthwhile and rewarding business.

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