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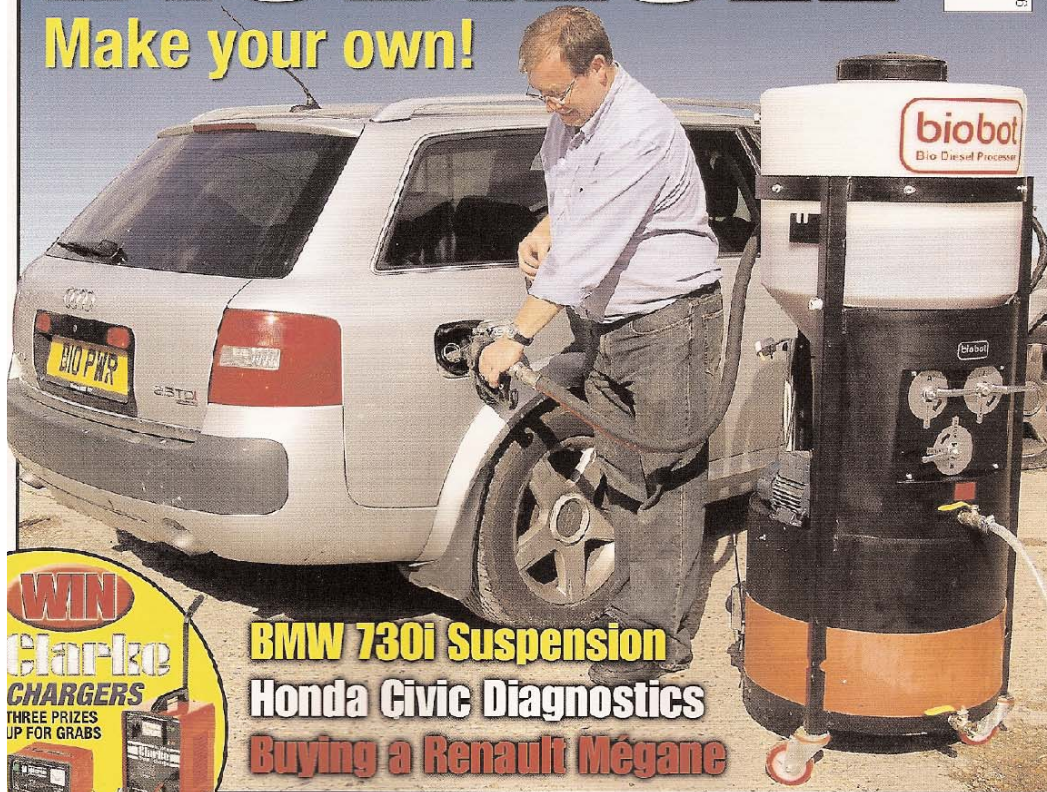
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BIODIESEL

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THE MAGAZINE THAT SAVES YOU MONEY – EVERY MONTH!



Practical Energy Solutions

Buyers Guide to Bio Diesel Processors

With so much equipment on the market today, it is worth taking a little time out to weigh up all of the Pros and Cons before making a decision as to what Processor you should purchase to make your Bio diesel.

We have tried to set out in this review a summary analysis of the features and technology used by different Companies. Each key area has then been broken out in our market matrix guides in order to see which processors come out on top for safety, ease of use and value for money.

All information in this guide has been taken from manufacturers web sites or published data and was correct to the best of our knowledge, at time of printing (October 2009).

50 - 100 Litre Processors

Make	Model	Price (£) Ex VAT	Batch Size (Litres)	Front Panel Control	Integrated Wheels With Lock	Immersion Element	Immersion Element In Plastic Vessel	Oil Heat Method - Belt	Integrated Methoxide Tank	Closed Catalyst Draw System	Internal Resin Dry Wash System	Water Wash Spray Mist Head	Water Wash Automatic Level Control	Dispensing Trigger Nozzle	Internal Oil Bund	Front De-Water Drain	Free Training
GreenFuels	Fuelpod 2	£2,500	50	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	No	
Biobot	BB75	£1,350	75	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Optional	Yes	Yes	Yes	Yes	
Etruk	Etruk 50	£995	50	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes	
GoldenRay	GR50	£997	50	No	No	Yes	No	No	No	No	No	Yes	No	Yes	Yes	Yes	
Fenland	50	£1,064	50	No	No	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	

100+ Litre Processors

Make	Model	Price (£) Ex VAT	Batch Size (Litres)	Front Panel Control	Immersion Element	Immersion Element In Plastic Vessel	Oil Heat Method - Belt	Integrated Methoxide Tank	Closed Catalyst Draw System	Internal Resin Dry Wash System	Water Wash Spray Mist Head	Water Wash Automatic Level Control	Dispensing Trigger Nozzle	Internal Oil Bund	Front De-Water Drain	Free Training
Green Fuels	Fuelpod 3	£3,500	100	Yes	No	No	Yes	No	Yes	Yes	No	No	Yes	Yes	No	No
Biobot	BB150	£1,850	150	Yes	No	No	Yes	Yes	Yes	Yes	Optional	Yes	Yes	Yes	Yes	Yes
Etruk	Etruk 100	?	100	No	Yes	Yes	No	Yes	No	Yes	No	No	No	Yes	Yes	Yes
GoldenRay	GR120	£1,697	120	No	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes
BioBuddy	125L	£600	125	No	Yes	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes	?
Fenland	100/200	£2,125	200	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Heating the oil –Immersion Elements or Heat Bands

The use of mounting a standard domestic immersion element – like the one to heat your water in at home is very common. The elements are cheap and the direct heating effect boils the oil reasonably quickly. Remember though, you are only trying to heat the oil uniformly to 60c and not cook it. The immersion elements rely on the use of a coarse thermostat in the immersion element to control the heat level. If this was to fail or was set too high, the oil would overheat and could prove to be very hazardous. This is particularly the case if the immersion is mounted in a plastic reaction process vessel. Here, if the thermostat were to fail or be in-correctly set, the outcome would be positively dangerous- It would be like creating a Chip Pan out of plastic! For this reason, we would always recommend steering clear of any plastic processor with an immersion element mounted directly in it. We have highlighted this as a **Red Flag** in our matrix above. The other issue to consider if you purchase a processor with an immersion element in it, is the possibility that if you tip or spill methoxide (containing methanol, which has a low flash point) over the hot immersion element, this could represent another potential safety issue. We have highlighted processors in the matrix which use an immersion element with a **Yellow Flag**. Heat Belts or Bands offer a safe and indirect form of heating waste oil. These are positioned at the bottom of the oil vessel and the temperature is easily set via a thermostat dial at the side of the belt. Heating the oil indirectly is a much safer proposition. The cost of heat belts is much higher, but in our opinion, the extra safety these offer is worth the extra expense. We have used a **Green Flag** to highlight those processors which used this form of oil heating.

De-watering Process

When you collect waste oil from various sources: restaurants, pubs, fish & chip shops, there is a high chance that the waste oil has been left outside in the open, often in containers with pouring holes or air holes left open. Given this, there probably is a reasonable amount of water in the waste oil. This water really has to be removed before the biodiesel process is started. For this reason, we would strongly recommend that you choose a processor which has a de-water tap. This is used to drain off the water once the oil has been heated up to temperature.

We have **Green flagged** Processors with this feature.

Adding the Methoxide to the hot oil in the processor

Always ask questions and examine the way each processor introduces the methoxide into the processor. Adding it in from the top of the vessel by pouring or opening camping taps directly into the processor, especially if on to a potentially hot immersion is really a hazard from a safety perspective. These days, all reputable processors will provide a closed method of drawing in the chemicals at a given appropriate rate.

Air Pumps or Electric Pumps

Today, if you use a good quality electric pump, the risk of any sparking is really very minor. In any case, if your biodiesel processor has a closed system to introduce the methoxide into the processor, then the chances of igniting any methanol is minuscule. That said, if you want to specify an electric pump with ATEX approval, you are looking at a

cost of over £1,000- that's before the cost of any processor. It is possible to buy processors using an air pump which could be claimed as a safety feature having an ATEX rating. However, if the air pump processor is linked to a domestic small electric compressor situated very close to the processor, any real safety advantage offered by the internal air pump is really taken away, as the domestic compressor will contain a standard electric pump, similar to the ones used on processors using electric pumps.

Air compressors are also inherently noisy and could become a real nuisance to other household members or neighbours when run for hours at a time. Given the above, we can see no real safety advantage using an air pump and domestic electric compressor in biodiesel processors. In addition, these units are getting on for twice as expensive as others on the market.

Water Wash or Dry Wash

Water washing is very inexpensive but takes time. The time taken for each wash and the number of water washes needed depends on the amount of biodiesel you are making at one time and how dirty your oil is to start with. As a guide, each water wash will take no less than one and a half hours for each wash and three washes are typical. You would need to be involved in each wash and dispose of the contaminated water from each wash. After water washing, the biodiesel will have to be dried or bubble washed. This will involve reheating the biodiesel and boiling off any remaining water or slowly bubbling out any remaining water. Either way, if you have got all day then water washing might be worth considering. If you are going to water wash, make sure, you select a processor which has an automatic water level shut off, this way you won't at least forget to turn off the tap and over fill the processor resulting in a flood!

Dry washing provides a clean and easy alternative to water washing. Make sure you use resin which removes the methanol as well as the soap and water. If the water wash is integrated in the processor, then all that is required is to set the processor to filter or purify and leave. The biodiesel is passed through the resin filter and circulated back into the processor tank. The quality of the bio diesel is excellent and the cost of the resin is not going to substantially change the cost of the bio diesel per litre. Given this, we would recommend using a processor which has an integrated dry resin wash. In our processor matrix, we have **Green Flagged** processors with this feature.

Dispensing the fuel

Having a processor which has a small foot print and is on wheels is a real positive feature. This way, the processor can be easily moved to the vehicle to dispense the fuel. Make sure that the processor is fitted with good quality wheels, with a locking device for additional safety. Drum dollies or small castors will not be very suitable or safe movement over gravel or bumpy surfaces. We have **Green Flagged** processors which have integrated wheels with a lock.

Best Value for Money

Using our matrix and the colour coding, will enable you to zone in on the processors which offer ease of use, safety and value for money.

Remember **Green is good!**