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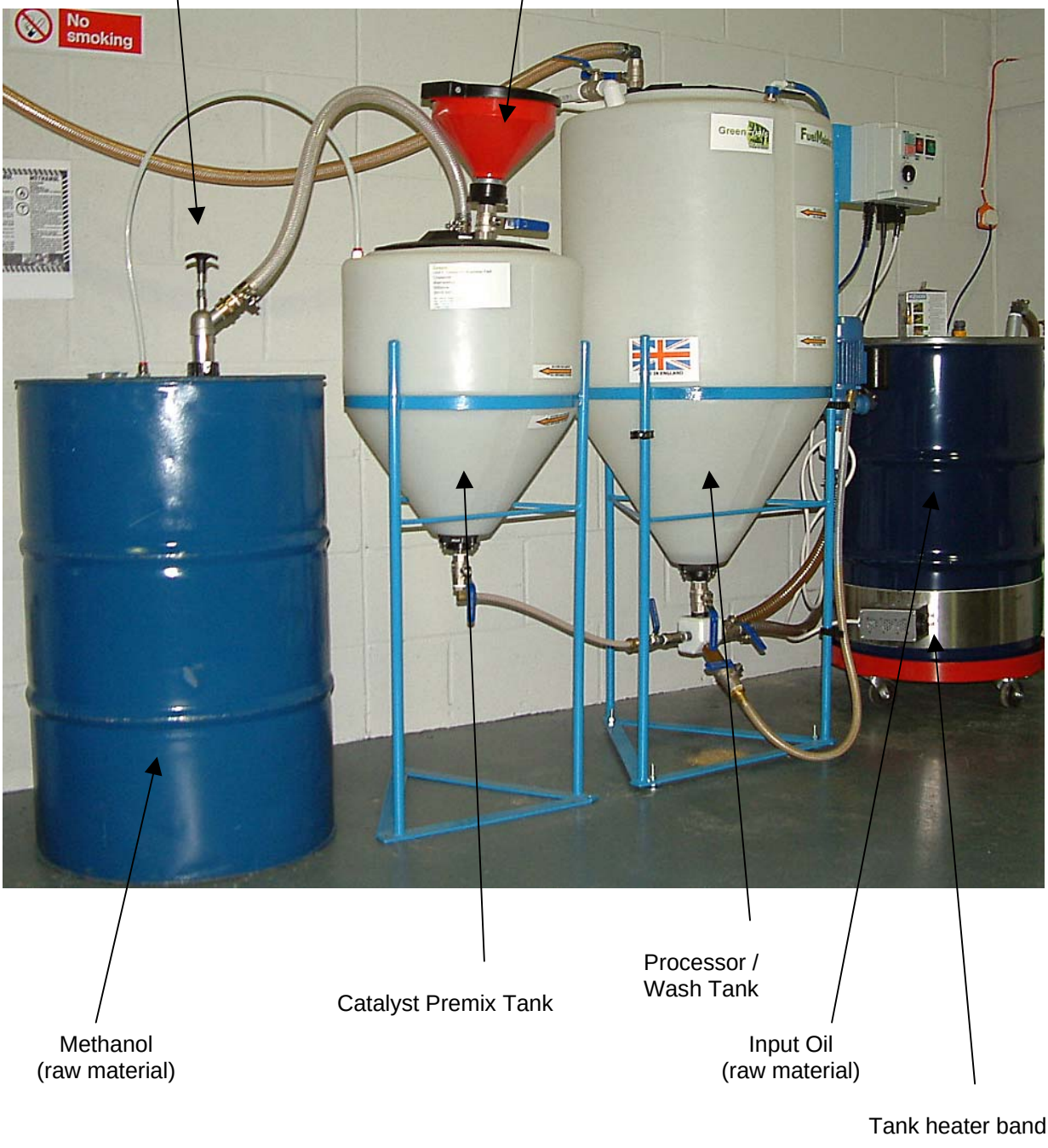
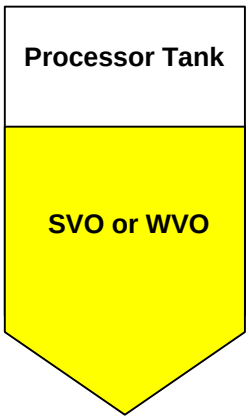
Biodiesel Processing Overview



Steps

The main process is accomplished through the Processor Tank, the Catalyst Premix tank, and (on larger systems) the Wash Tank.

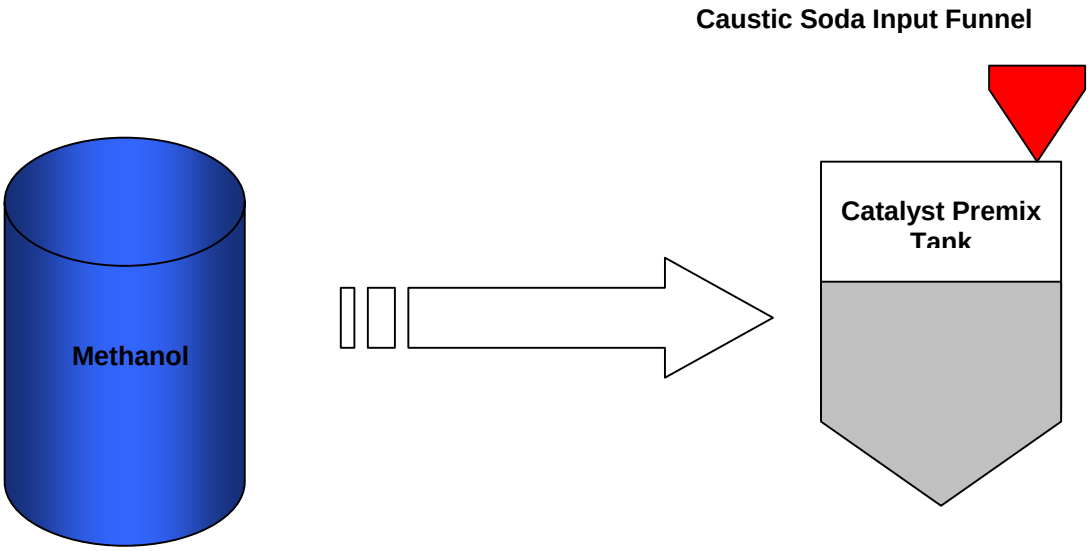
1) Fill the Processor Tank with 150 litres of straight vegetable oil (SVO) or waste vegetable oil (WVO) heated to between 50 and 60 °C



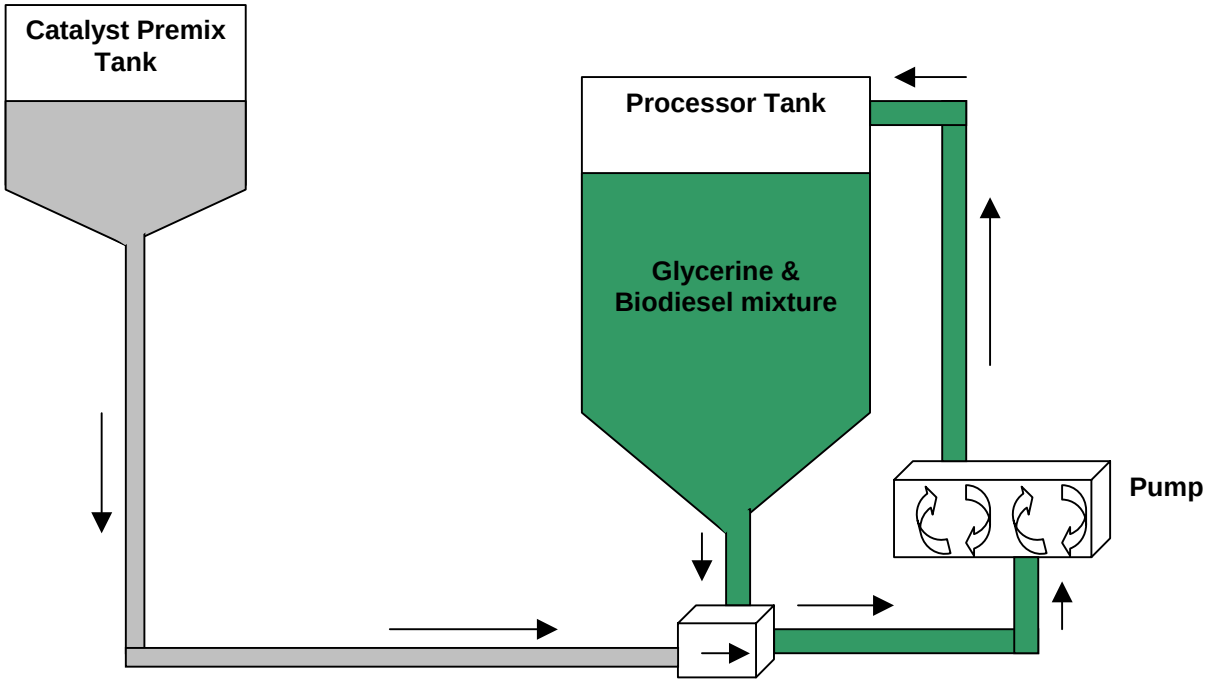
Note: A diesel vehicle can be run on this SVO or WVO without the processing. However, this is NOT recommended for the following reasons:

- SVO and WVO are not eligible for the 20 pence duty reduction (UK). Proper biodiesel is.
- A vehicle cannot be started with SVO or WVO, as it requires a higher temperature for combustion, thus the engine must be warmed up before SVO/WVO can be used.
- SVO and WVO do not burn cleanly and completely, and emit higher quantities of pollutants than biodiesel. Modern diesel engines are simply not designed for SVO or WVO, and engine wear is likely to be accelerated.

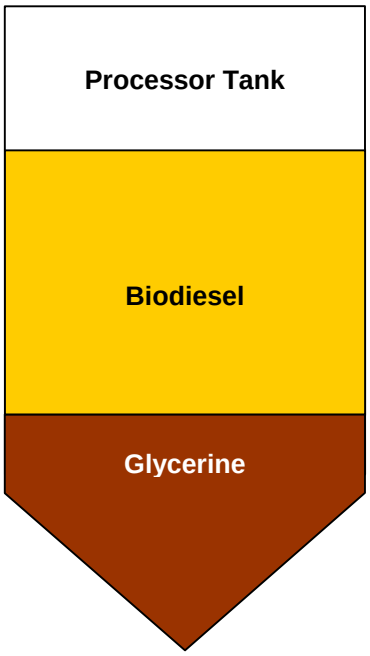
2) After a titration test is performed on the oil, the corresponding amount of caustic soda is added into the red funnel on top of the Catalyst Premix Tank.
3) SLOWLY, with the hand pump, add 30 litres of methanol to the caustic soda tank.



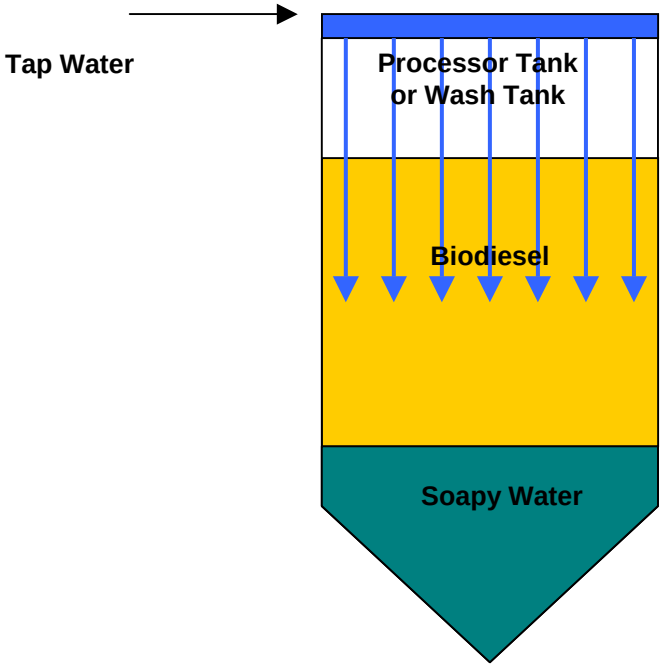
4) After the proper amount of methanol has been added to the Catalyst Premix Tank, turn on the mixing pump to begin circulating the SVO/WVO. The catalyst will be drawn into the manifold at the bottom of the Processing Tank by a Venturi created by the circulation. The resulting mixture will be a blend of glycerine and biodiesel solution.



5) After mixing is complete, allow the mixture to settle for a period of time. Glycerine will separate from the fuel, and form a darker mixture at the bottom of the processor tank. The glycerine is drained off by gravity using the drain valve and visually inspecting the clear sight tube. If the mixture is correct, the exact same amount of methanol that was mixed in will now be drained off as glycerine.



6) After the glycerine is drained, the remaining biodiesel is ready to be washed. Washing is a process of spreading a mist of tap water over the top of biodiesel. Since water is denser than the biodiesel, it will work its way through the mixture and settle at the bottom, taking any residual soaps along with it. The process can either be completed in the Processing Tank, or pumped into a Wash Tank (on larger systems). The advantage of the separate Wash Tank is that the Processing Tank will be freed up to make the next batch of fuel.



7) The water is then drained off similar to how the glycerine was drained, and can be disposed of to foul drainage, as it is the equivalent of soapy water. What it left is Biodiesel (>97% Methyl Ester). The amount of biodiesel left is equal to the amount of SVO or WVO that you began with, as the volume of glycerine removed is the same as the volume of methanol added (always 1:5 ratio methanol to SVO/WVO)