



## **Steri-flow** **Filtration Systems**

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## **Biodiesel Process Solutions**

### **The Process**

Vegetable oils, such as soybean oil, rapeseed oil, corn oil, palm oil and others as well as animal fats and recycled greases are the major sources of biodiesel. Regardless of the feedstock, transesterification reactions are carried out to produce biodiesel. The transesterification reaction of triacylglycerols (TAGs) in oils is usually done by reacting the TAGs with methanol in the presence of a basic catalyst yielding the fatty acid methyl ester (FAME). During the transesterification process, intermediate glycerols such as monoacylglycerols (MAGs) and diacylglycerols (DAGs) are formed which can remain in the final biodiesel product. Besides these MAGs and DAGs, unreacted TAGs can also be present and contaminate the final product. The contaminants can lead to severe engine problems.

Filtration down to 1 micron can remove a certain amount of the contaminants, however once the biodiesel is blended with mineral diesel further contaminants will precipitate out of solution. Hence reliable filtration to sub-micron levels is required.

### **The Solution - One-step Biodiesel Filtration**

Steri-flow has developed a process specific membrane and filter system that provides biodiesel producers with a solution to ensure their product meets and surpasses the industry quality standards and requirements, in one single pass.

Key product parameters that the Steri-flow solution can seriously improve upon are:

- **Total Contamination (TC)**
- **Filter Blocking Tendency (FBT)**
- **Phosphorous Content**

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The **Steri-flow Biodiesel Filtration System\*** can provide producers with a biodiesel product that is accepted by the most demanding customers, including the “oil majors” who blend the bio-fuel with mineral diesel.

The Steri-flow system has been well proven to reduce Total Contaminants levels from well above specification to minimal levels within the range of 2-7 ppm, in a single pass operation.

A new requirement to be imposed upon biodiesel producers is the Filter Blocking Tendency Test (FBT), as is applied to mineral diesel. The mineral diesel specification level is 2. The Steri-flow system will significantly reduce the FBT of bio-diesel to acceptable levels as required by the oil companies for blending with their feed-stock.

Analysis of biodiesel produced via a Steri-flow Biodiesel Filter also indicate that phosphorous levels are reduced, thus further improving the quality of the final product.

The Steri-flow Biodiesel Filtration System is based upon the original robust Steri-flow sintered stainless steel microfilter membrane, which now has been further developed specifically for this application\*. The inherent characteristics of the Steri-flow membrane means that there is no replacement filter media to deal with (providing no ongoing costs and no maintenance issues) , it can handle the extremes in temperatures and aggressive chemicals, and is a truly robust industrial plant that will operate 24/7 in an industrial environment.

Cleaning of membrane and other separation systems has always presented operators with high levels of generated waste, the consumption of significant quantities of potable water and chemicals and effluent disposal costs and issues. The Steri-flow system overcomes these major problem areas via the simple use of steam as the cleaning medium.

The modular design combined with high continuous flux rates allows for this technology to be utilised with any size commercial biofuels plant, whether running batch or continuous production.

The bottom line for the biodiesel producer is:

- Maintenance and running costs are minimal
- Automatic filter operation and cleaning cycles free up operations staff and resources to attend to other functions
- Bio-diesel quality surpasses the industry standards, thus ensuring cash flows through the full and immediate product acceptance by your customers.
- Minimal waste
- Minimal use of resources

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