
SRS
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BIODIESEL TECHNOLOGY

Biodiesel Distillation

Biodiesel quality continues to be a concern for diesel engine makers, fleet managers, and the public in general. Variability in the quality of biodiesel, coupled with the high cloud point of biodiesel produced from certain feedstocks, has resulted in the ASTM adopting more stringient biodiesel standards. In October 2008, the ASTM revised the ASTM D6751 standard, requiring all finished biodiesel to pass a cold soak filtration test. This new testing requirement was designed to improve the cold weather performance of biodiesel.

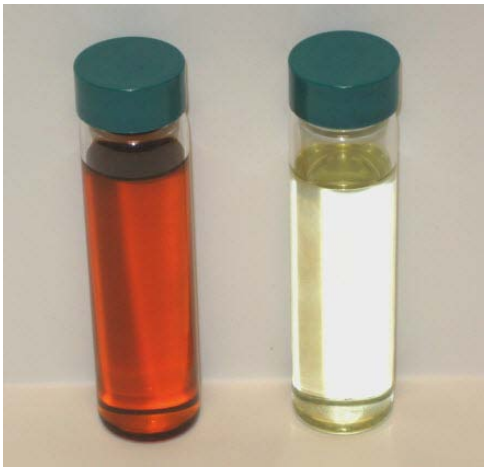
So what does this mean for current biodiesel producers?

The answer is...it depends. It depends on the feedstocks currently being used, and on the process technology used to convert those feedstocks into biodiesel. The new ASTM D6751 cold soak filterability test is a measure of how well biodiesel flows when chilled then poured through a filter. Biodiesel that may have passed the previous ASTM tests may fail this test because biodiesel produced from feedstocks with high gel-points inherit this attribute from their feedstocks. Worse yet, homogenized oils, or feedstocks that are blended from many sources, can have gel points that vary from sample to sample. Yellow grease, white grease, and waste vegetable oil (WVO) all fall into this category.

So what can be done to help ensure feedstocks with high FFA can be made to pass the cold soak filterability test? There are really three approaches to addressing cold filterability:

- Select feedstocks that have low gel-points (Soy for instance)
- Use fuel additives to lower the gel-point of existing feedstocks
- Improve the cold filterability by distilling your biodiesel

Switching to soy can be an expensive proposition. Using fuel additives can help, but adds significant and recurring costs to your production. Distilling your biodiesel produces the purest form of biodiesel possible and dramatically reduces cold filterability of most feedstocks (see photos above). Another advantage of distilled biodiesel is that no further washing is required, so dry washing Ion Exchange or Magnesol is unnecessary.



Biodiesel Distillation

Left - Finished Biodiesel
Right - Distilled Biodiesel

Both samples came from the same batch

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Advantages of Biodiesel Distillation:

- Creates product homogeneity
- Creates a superior biodiesel when using both virgin and animal feedstocks
- Market differentiation by creating the purest biodiesel possible
- Takes sulfur out of high sulfur feedstocks like beef tallow and chicken fat (up to 80 PPM)
- Meets ASTM specifications

Are you concerned about passing Cold Flow Filtration? SRS Engineering has the answer to your problem with our ASVB-Series Distillation System which distills your biodiesel, creating the purest biodiesel possible. By distilling your biodiesel you can be back in business in no time with ASTM compliant biodiesel. And, you don't have to worry about losing the $1/gallon tax credit!

Not sure if your biodiesel will pass? Perform this quick test: Put a jar of your biodiesel in the refrigerator for a few hours, then check:

- Clarity – does the fuel get hazy or cloudy?
- Solids - do you see solids forming or crystallization?
- Viscosity change - Is your chilled biodiesel noticeably thick and slow pouring?

If any or all of these are present, you may be in trouble.

What types oils need distillation?

Yellow Grease, Animal Fats, & Waste Vegetable Oil (WVO) feedstocks consist of odors and impurities which need to be removed during the distillation process.

Canola (Rapeseed), Palm, and Jatropha which are treated oil feedstocks, have a peculiar odor that needs to be removed. This must be done during the distillation process.


Animal Fats


Canola (Rapeseed)


Jatropha


Palm


WVO - Waste Vegetable Oil

Biodiesel can be made from various different feedstocks and will vary in color from oil to oil. In all cases, you can expect clear distillate depending on the type of impurities present in the oil. During the distillation process, the soluble solids and high boiling impurities will remain at the bottom and the color of the finished biodiesel may not always be crystal clear, depending on what feedstock was used. The decolorization is important as biodiesel tends to darken during storage due to oxidation. Antioxidants are added to increase shelf life during it's time in storage.

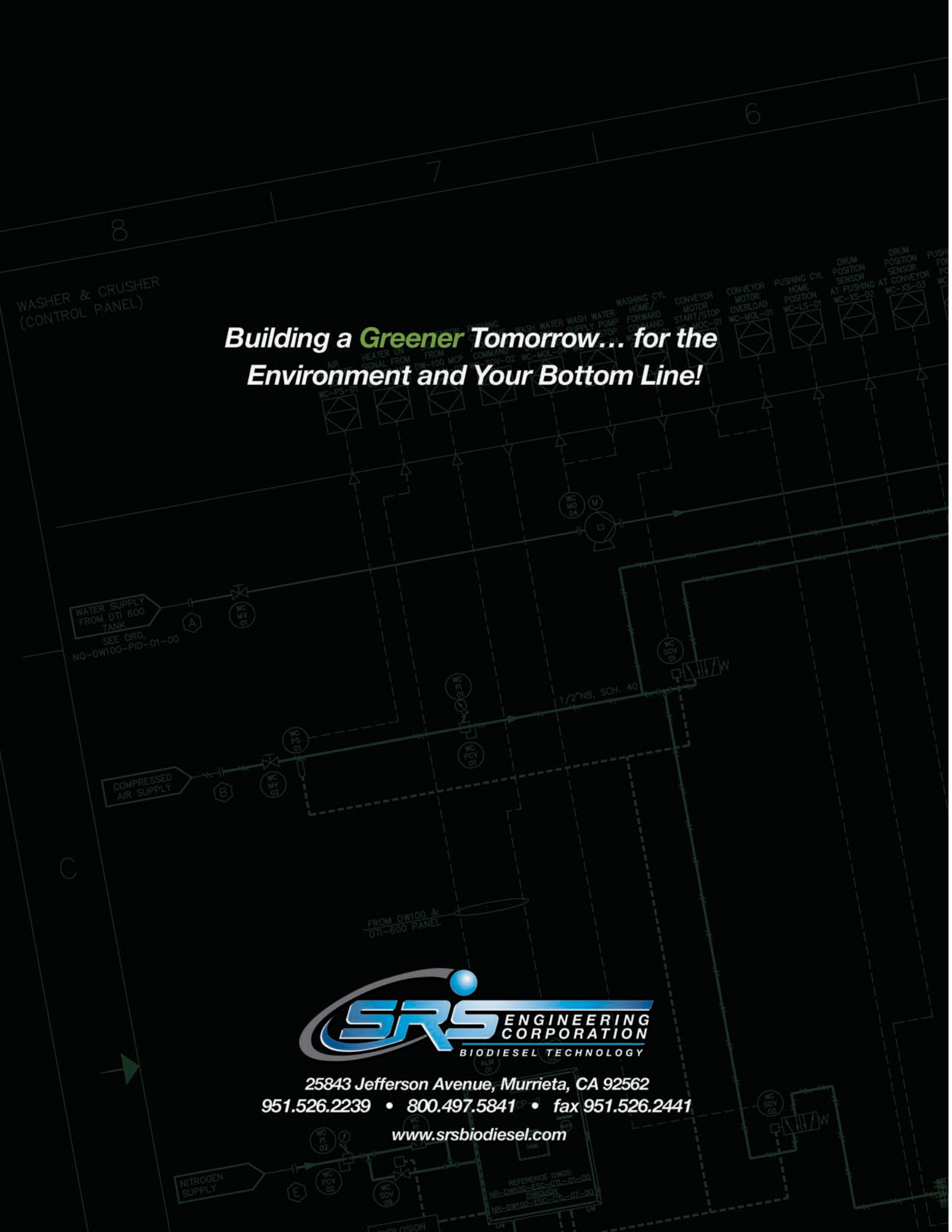
With the new ASTM standards (ASTM 6751) recently revised, allowable levels of water, metals, and sediment has greatly reduced. This has been implemented to reduce particulate emissions, fouling, filter plugging and other potential engine problems.

How distillation works?

During the transesterification process sodium methylate is added which remains in traces along with unreacted oil, mono and diglycerides, metals, and other heavy contaminates which need to be removed.

After the transesterification process sodium hydroxide, water & soap are formed and remain in traces after physical separation or washing/polishing and must be removed to meet ASTM specifications. Any water that is present in the biodiesel tends to hydrolyse the long chain free fatty acids which cause the acid value to increase during storage. Water content cannot exceed 500ppm and biodiesel distillation will help with this process.

For information on cold soak filtration and biodiesel distillation, call us today at **(800)497-5841** or email us at sales@srsengineering.com



Building a Greener Tomorrow… for the Environment and Your Bottom Line!

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