Best Practices of Biodiesel Production: Program Operation

Dear Reader:

The following document was created from the MTAS website (mtas.tennessee.edu). This website is maintained daily by MTAS staff and seeks to represent the most current information regarding issues relative to Tennessee municipal government.

We hope this information will be useful to you; reference to it will assist you with many of the questions that will arise in your tenure with municipal government. However, the *Tennessee Code Annotated* and other relevant laws or regulations should always be consulted before any action is taken based upon the contents of this document.

Please feel free to contact us if you have questions or comments regarding this information or any other MTAS website material.

Sincerely,

The University of Tennessee
Municipal Technical Advisory Service
1610 University Avenue
Knoxville, TN 37921-6741
865-974-0411 phone
865-974-0423 fax
www.mtas.tennessee.edu

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When Gasden's program started, 55-gallon drums were distributed to participating restaurants. Fleet management personnel checked the drums once each week, and generally picked them up when the drum contained about 35 gallons, or every other week, whichever came first. When the full drum was picked up, another drum was left at the restaurant.

The residential WVO jugs were placed in the storage bins, which were located at seven community centers in Gadsden. While other cities have chosen to place the collection bins at grocery stores, Gadsden chose to use its network of community centers. The bins are configured so that empty, clean containers are placed on the top shelf, while full containers are placed on the bottom shelf. Also, the bins are designed so that larger containers of WVO (such as those two-gallon containers used for turkey frying, etc.) can be placed on the bottom shelf.

Once the oil is picked up and transported to the fleet management facility, it is poured (in the case of the one-gallon jugs) or pumped (in the case of the 55-gallon drums) into the chemical storage totes. If water is detected in the WVO, the oil is heated and allowed to cool to separate the water from the oil. Because there are several 275-gallon totes, a rotating procedure is used where the oil is allowed to settle for nearly one week before being used for biodiesel production. The WVO is pumped from the top portion of the tank through a filter and into the biodiesel processor.

After the oil is pumped into the biodiesel processor, minimal labor is required by the fleet management personnel to perform the process. The processor used by Gadsden is a relatively self-sufficient processor that will conduct most of the process automatically. Before starting the transesterification reaction, the WVO is heated to 140 degrees and a sample of oil is removed for the titration procedure, in order to determine how much catalyst is required for biodiesel production. After the titration process is complete, methanol is added to a separate methanol tank and the catalyst is poured into a methyl/ oxide mixer drum. After starting the reaction process, it will take approximately one and a half hours for glycerin to begin separating from the biodiesel and another one and a half to two hours for the glycerin to be completely separated. The system uses a dry wash process that requires an additional three hours to complete. After being allowed to cool, the finished biodiesel can be filtered through a five micron filter, and pumped into the fuel storage tank. Biodiesel is splash blended with petroleum-based diesel to create blends of B10 or B20 for various fleet vehicles or machines.

Glycerin that results from the process is drained from the reactor vessel into a clean 55-gallon drum for later disposal. Disposal options have included composting and transferring to a nearby business that manufactures soaps.

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