How To Make Biodiesel: A Starter Guide

How To Make Your Own Biodiesel Factory

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Got the heart for energy conservation and time to spare? Do your part to save energy by making your own biodiesel at home. It's a fairly simple process that uses readily available ingredients, so anyone with enough willingness and interest can make it.

Biodiesel fuel is a clean processed fuel equivalent to diesel, which is made purely from biological sources. Unlike straight vegetable oil or waste vegetable oil, biodiesel can be readily used on diesel engine vehicles.

Biodiesel is fairly easy to produce, and anyone ca n make it in the comfort of their own homes. Here's how:

You will need:

- a blender
- scales
- two funnels
- measuring beakers
- an HDPE container
- a PET bottle
- a liter of new and unused vegetable oil
- 200ml of methanol (preferably 99% or more pure)
- a lye catalyst, such as sodium hydroxide

Directions:

Use a funnel to carefully pour the 200ml methanol onto the HDPE container. Afterwards, add the lye catalyst onto the HDPE container using another funnel. Tightly close the container with a cap.

Once the cap is secure, swirl the bottle around a few times, for a couple of minutes, causing the lye to dissolve. Keep swirling until the lye dissolves completely.

In the meantime, pre-heat the vegetable oil to 55 degrees Centigrade, and afterwards, pour it on a blender. It is best to use a blender that's second -hand or one that you don't use in the kitchen anymore. While the blender is still

turned off, carefully pour the contents of the HDPE container (the methanol and the lye catalyst) with the vegetable oil. Secure the lid of the blender, and blend the mixture for at least 20 minutes at low speed.

After the mixture has been properly blended, pour the concoction onto a PET bottle. Screw the lid on tightly and allow the mixture to settle for 12 to 24 hours.

Once the mixture looks translucent or clear, it is dry and hence ready to use. The length of the process differs, from a day to a few days. Heating the mixture further hastens the process.

Before using your home-made biodiesel, it would be best to first test its quality using a variety of methods which you can find over the internet.

You can also scour the internet for other ways and methods to make biodiesel. Some prefer using a mini-processor instead of a blender, while others use other kinds of lye catalysts, such as potassium hydroxide.

If your first batch of biodiesel isn't as effective as you might have expected, don't fret – all it takes is a little patience, a lot of willingness, and the interest and energy to do it all over again, until you get it right.

While doing anything and everything that you can to help conserve energy is undoubtedly noble, it is important to remember that in making biodiesel, you are dealing with materials that may be dangerous or harmful if not handled carefully. When making biodiesel at home, safety should be your first concern. Take all steps necessary to avoid any accidents, keep your materials away from children and pets, and always take great caution in all that you do.

How Is Biodiesel Made?

The world's demand for oil has increased in the past 50 years. This is evident as more people own and drive cars and an increase in the number of passengers hopping on airplane for business and vacation.

Analysts believe this has brought the price of crude oil to almost $70 a barrel last year. Since this is a non-renewable source of energy, it won't be long before there won't be any left which is why scientists are urged to find an alternative.

Fortunately, there may be an answer. This comes from vegetable oil through a process called transesterifcation, which is how bio diesel fuel is made.

Bio diesels were first discovered in the early 1900's. This was not developed further as people relied on oil deep beneath the earth to fuel man's precious machines.

Turning vegetable oil into bio diesel takes about 6 to 8 hours and undergoes a 12-step process. The first is to get the organic oil from the plants. Once a batch has been collected, this is then heated to a temperature of 120 degrees Fahrenheit.

The fuel should be pure and the only way to check on this is by monitoring the titration levels. If everything checks out, this is then mixed with lye and methanol in a processor. Some time must be given in order for the oil to separate. This is then cleaned with water and when it is finished, this can now be used as fuel for the car.

Is biodiesel good for the car's engine?

Tests have shown that it is safe to use and is cleaner for the environment. Some countries in South America have started used this in fuelling its buses.

Aside from ingredients coming from plants, tests have shown that people can also make this at home from the oil used for cooking. The person will just need some equipment to make it pure since can cause damage to the engine if the appropriate steps are not taken.

The price of a biodiesel kit varies but in general, this comes with three things namely the heating device, the thermostat and th e rubber hoses.

Tests have shown that the engines of some old cars are not compatible with this alternative fuel. The person should have it checked first with the manufacturer so if this is the case, the customer can have this converted.

In the United States, the most popular form of biodiesel is ethanol. This comes from sugar cane and is already being sold in some gas stations. Although it is cheap now because motorists are still relying on diesel and unleaded gasoline, this will change as the demand for b iodiesel in the future increases.

Apart from using biodiesel to decrease the demand for non -renewable fuels, car manufacturers are also trying other things. A good example is the electric car that was made by both Toyota and Honda. Drivers can switch to ba ttery mode since the automobile is equipped with a rechargeable battery with US manufacturers coming up with something similar to follow suit.

So, if people want to reduce the dependency of oil coming from the Middle East and do their share in protecting t he environment, biodiesel fuel is the way to go. It's safe and clean so the next generation will be able to enjoy what is there like we once did.

Myths And Facts About Biodiesel

Biofuels are produced from biomass, which is a materi al derived from recently living organisms like plants, animals and their by -products. Unlike other natural resources such as petroleum, coal and nuclear energy, biofuels are produced from renewable energy sources based on the carbon cycle. This means that the plants harness carbon from the air (e.g. CO2) and then it is transformed into energy sources, like biodiesel.

The two main biofuels developed and used commercially are ethanol and biodiesel.

There are basically three main drivers for the development of biofuels:

- The increasing price of fossil fuels
- The search for a renewable sources of energy
- Increasing pollution levels due to the use of petroleum derived products

There are many myths and facts concerning biodiesel and we have chosen to address the most frequent ones...

1. **Myth:** There is no difference between ethanol and biodiesel.

Fact: These are both biofuels, but, totally different. Biodiesel is the result of transesterification (basically taking out of glycerin) of a vegetable oil or animal fat and can be used in any diesel motor.

Ethanol is the most common biofuel worldwide. It is produced by fermentation of sugars derived mainly from sugarcane and corn. Engine modifications are needed in the case of gasoline motors, to be able to use more than 15% of ethanol in the blend (E15). However, flex-fuel cars are being produced that can use pure gasoline, pure ethanol or any blend of both. In Brazil, 90% of new cars are flex-fuel.

2. **Myth:** Pure vegetable oil can be used in diesel engines.

Fact: Pure vegetable oils are processed beforehand and produce approximately 90% biodiesel and 10% glycerin. It is important the glycerin be separated, as glycerin would glue on to the motor parts, eventually affecting the engine.

3. **Myth:** The use of oilseeds to produce biodiesel will increase the price of food.

Fact: Whenever a product, that is being used for food, is used for energy, it means there will be less food available and the price will go up. A good example is soybeans, which are crushed to mainly produce oil and soymeal, for animal feed. In the case of soybeans for energy, with the increase in demand,

the price of soybeans increases and consequently so does the price of animal feed. Therefore there is an increa se in the cost of producing meat, milk, eggs, etc. A similar situation happens with corn, used for ethanol; the result is an increase in the price corn products. The challenge now is to use the most efficient source possible to make biodiesel, so the imp act on the price of food is mitigated.

4. **Myth:** After using biodiesel, it is impossible to go back to using petrodiesel.

Fact: Biodiesel and petrodiesel can be interchanged with no problems, in diesel motors. It is important to note that that this is not the case in gasoline engines; these cannot be used with more than 15% ethanol unless the engines have been adapted.

5. **Myth:** The use of biodiesel requires some engine conversion.

Fact: There is no engine conversion required, except for the replacement of some types of rubber fuel lines in the case of vehicles produced pre -1990.

6. **Myth**: Biodiesel will ruin my engine

Fact: Actually, your engine will run smoother and cleaner on biodiesel than petrodiesel.

7. **Myth:** Biodiesel is an experimental fuel that hasn't been thoroughly tested.

Fact: In countries that have used biodiesel for some time, like Europe and the US, pure biodiesel and biodiesel blends with petrodiesel have been thoroughly tested and are available at various gas stations. In Brazil, the policy is to include 2% of biodiesel in the petrodiesel in 2008 and then go increasing the percentage in the mixture. However, pure biodiesel or stronger mixtures are not available at the pumps in most parts of the world. The adoption of biodiesel worldwide is relatively new, especially when compared with ethanol, which was available in Brazil in the stations in the late 70s. Presently, all the

stations have hydrated ethanol (7%water) and all the gasoline has approximately 25% of pure ethanol at the pumps. As from 2008, all diesel pumps will have 2% biodiesel.

8. **Myth:** Biodiesel performs just as well as petrodiesel.

Fact: It seems to have been proven that biodiesel looses around 1% in power compared to petrodiesel, almost negligible. In the case of ethanol, it looses 30% in power compared to gasoline.

9. **Myth:** Biodiesel is not affected by low temperatures.

Fact: It freezes just before petrodiesel and in very cold areas it is recommendable to mix both.

10. **Myth:** Biodiesel costs too much.

Fact: In the US, it is slightly more expensive than petrodiesel, or at best, ver y similar. In Brazil, biodiesel is considered viable when the price of petroleum surpasses 65 US$/barrel. In the case of ethanol, it is economically viable with the price of petroleum over 33 US$/barrel.

11. **Myth:** There can be no shortages of the product

Fact: The production of Biodiesel requires careful planning. We must remember that biodiesel comes from crops so it has to be planted before being produced. A normal cycle takes about 6 months and coordinating the availability of the soil, buying inputs, et c. another 6 months. In the case of petrodiesel, it is easily available by increasing production.

12. **Myth:** Biodiesel pollutes just as much as petrodiesel

Fact: In the use of biodiesel, there is a very considerable reduction of carbon dioxide (greenhouse gas) and carbon monoxide (poisonous gas). There is zero emission of sulfur dioxide (acid rain).

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