



BRIEFING

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Biodiesel: Frequently Asked Questions

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Consumer Issues:

What is biodiesel?

Biodiesel is a fuel produced by combining a vegetable oil or animal fat with alcohol and a catalyst. Biodiesel is a fuel that can be used in traditional diesel engines with few if any modifications. Biodiesel can also be defined as a fuel comprised of fatty acid methyl esters (FAME).

Is biodiesel required to meet fuel quality standards?

Biodiesel produced for sale is required to meet fuel quality standards. The fuel quality standards for biodiesel are defined by the American Society for Testing and Materials (ASTM) in standard "ASTM D6751." This standard includes acceptable levels for water and sediment, sulfur, free and total glycerin, flashpoint, cetane number and other specifications. Petroleum diesel fuel is also required to meet fuel quality standards. These standards are defined in "ASTM D975-05."

Is vegetable oil the same as biodiesel?

Biodiesel and vegetable oil are not the same product. Although vegetable oil is the main ingredient

in most biodiesel, the vegetable oil must undergo a chemical reaction (transesterification) with alcohol and a catalyst before it can be considered biodiesel. Vegetable oil that has not been reacted with an alcohol and a catalyst is commonly referred to as waste vegetable oil (WVO), straight vegetable oil (SVO) or virgin oil.

Do I have to modify my engine to use biodiesel?

In most cases no modifications are required to use biodiesel in an engine designed for petroleum diesel fuel. Some types of natural rubber compounds can be degraded by repeated contact with biodiesel (particularly when blends of over 20% biodiesel are used). Older vehicles are more likely than newer vehicles to contain natural rubber fuel lines and seals. These fuel lines and seals may need to be replaced if high blends of biodiesel will be used on an ongoing basis.

Will using biodiesel void my manufacturer's warranty?

Engine manufacturers typically only warrant the engine for defects in "material and workmanship." Engine manufacturers also recommend the type of fuel the engine was designed to use. Any engine

damage caused by fuel (of any type) is generally not the responsibility of the engine manufacturer. Many engine manufacturers have issued statements about their recommendations for biodiesel, some of these statements are available at: www.biodiesel.org/resources/fuelsheets/standards_and_warranties.shtm.

What does B20 mean?

Biodiesel is usually blended with petroleum diesel before it is sold. Biodiesel is commonly sold as a 2%, 5%, 20% or 50% blend with petroleum diesel. A fuel sold as B5 will contain 5% biodiesel and 95% petroleum diesel. A fuel sold as B20 will contain 20% biodiesel and 80% petroleum diesel. Biodiesel that is not blended with petroleum diesel is referred to as B100, neat biodiesel or pure biodiesel.

Where can I buy biodiesel?

Biodiesel is not available at most retail fuel locations in Montana. The Montana DEQ maintains a list of biodiesel retailers in Montana. This list is available at: www.deq.state.mt.us/Energy/bioenergy/BiodieselRetailers.asp. The National Biodiesel Board maintains a list of biodiesel retailers across the country. This list is available at: www.biodiesel.org/buyingbiodiesel/retailfuelingsites/.

Will biodiesel work in the winter?

Biodiesel has a higher cloud point and pour point than petroleum diesel. The cold weather properties of biodiesel depend on the type of oil or animal fat that was used to produce the biodiesel.

Most biodiesel is produced from soy oil. Soy oil based biodiesel (B100) has a pour point of approximately 32 degrees Fahrenheit while number 2 diesel fuel has a pour point of approximately negative 16 to 18 degrees Fahrenheit. Lower blends of biodiesel will have lower cloud and pour points. Biodiesel produced from other feed stocks (such as canola or palm oil) will have different cold weather performance than soy based biodiesel. Additional information on cold flow properties can be found at: www.biodiesel.org/pdf_files/fuelsheets/Cold%20Flow.PDF or www.uidaho.edu/bioenergy/NewsReleases/TechNote3.pdf.

Does biodiesel contain less energy than petroleum diesel?

The energy content of a fuel is typically measured in British thermal units (BTU). Biodiesel (B100) contains about 8% less BTUs per gallon than number 2 diesel fuel. Therefore a blend of 20% biodiesel will contain about 2% less BTUs per gallon. Additional information on biodiesel energy content can be found at: www.uidaho.edu/bioenergy/Bioshortcourse/Need2know.htm.

Production Issues:

Can I produce my own biodiesel?

Yes, one of the unique aspects of biodiesel production is the ability to produce biodiesel in very small or large quantities. Small scale biodiesel production is commonly referred to as “home brewing.” Regardless of the size of a biodiesel production plant, fuel quality and safety are important

concerns. More information about small scale biodiesel production can be found at: www.ampc.montana.edu/briefings/briefing88.pdf and www.uidaho.edu/bioenergy/NewsReleases/Technote7_HB.pdf.

Where do I get vegetable oil to make biodiesel?

Vegetable oil can be obtained through several methods. One method is to contact a commercial oilseed processor and purchase oil directly from them. Another option is to either grow or purchase oilseeds and process them to obtain the oil (and meal). A third option is to collect waste vegetable oil from local restaurants. More information about oilseed processing can be found at: www.ampc.montana.edu/briefing.html.

What oilseed crops are grown in Montana?

Montana has produced canola, flax, safflower, sunflower, mustard and camelina in recent years. More information about Montana oilseed production can be found at: www.ampc.montana.edu/policypaper/policy19.pdf.

Where can I get a biodiesel processor?

Large scale biodiesel production equipment is available from a limited number of manufacturers. These large scale plants are often custom designed. Small scale production equipment is available from numerous manufacturers and can also be constructed from kits or plans. Those interested in purchasing a biodiesel processor may want to search for “biodiesel processor” on the internet; the

search results should contain the websites for several retailers.

What are the by-products of producing biodiesel?

Biodiesel production also produces glycerin (also called glycerol). The glycerin produced is unrefined or crude glycerin. For every 100 units of biodiesel produced approximately 10 to 20 units of crude glycerin will also be produced. Glycerin has many uses once it has been processed from crude to refined. For most small scale producers refining their crude glycerin will not be feasible. These producers must find a use or disposal method for their glycerin. These options including composting the glycerin or using it as a heating oil or boiler fuel.

How do I find out the quality of my biodiesel?

The quality of biodiesel is a major issue for both consumers and producers of biodiesel. Consumers that purchase biodiesel from any licensed producer can be confident that the fuel passed the ASTM fuel quality standards when it was produced. Consumers should properly store the biodiesel (limit water, other contaminants, and storage time as you would with petroleum diesel fuel) after it is purchased to ensure a quality product at the time it is used. Producers of biodiesel will need to have a quality assurance program in place if they plan to produce any fuel that isn't for their own use. This program will likely contain quality control aspects at various stages of the production process and final product sampling. These samples will then be sent to a commercial lab that offers biodiesel fuel quality testing. Small

scale producers making biodiesel for their personal use may choose to use less expensive and less accurate testing methods when producing fuel for personal use. More information on commercial biodiesel testing labs and other fuel quality testing methods can be found at: www.biodiesel.org/resources/fuelqualityguide/testinglabs.shtml and <http://phliptest.com/>.

Do I have to pay fuel taxes on biodiesel?

Yes, biodiesel is taxed like petroleum diesel fuel. Biodiesel purchased at a retail station will have the taxes already included in the price. Biodiesel producers (even small producers) need to register with the state of Montana and pay the applicable fuel taxes. Biodiesel for off road use is eligible for a refund of a portion of fuels taxes paid, similar to diesel fuel. More information is available at: www.deq.state.mt.us/Energy/bioenergy/index.asp.

Are there any federal or state programs that support biodiesel?

Yes, there are lots of federal and state programs that support biodiesel. These programs include tax credits for biodiesel production, grants, and government sponsored research. More information on these programs is available at: www.ampc.montana.edu/policypaper/policy16.pdf and www.deq.state.mt.us/Energy/renewable/TaxIncentRenew.asp.

Do I need to obtain permits or register to produce, use or sell biodiesel?

Yes, you must register with several agencies to legally produce, use

and sell biodiesel. Properly registering also allows producers to participate in government incentive programs for biodiesel. Licenses or registration may also be required for certain storage tanks, retail pumps, building code compliance, recycling used vegetable oil and other aspects of the building, production, storage and marketing of biodiesel. More information is available at: [http://deq.mt.gov/Energy/bioenergy/Biodiesel Production Educ Presentations/Biodiesel Permits License Considerations May2007.pdf](http://deq.mt.gov/Energy/bioenergy/Biodiesel%20Production%20Educ%20Presentations/Biodiesel%20Permits%20License%20Considerations%20May2007.pdf)



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