

Biodiesel Fuel

The benefits of marine soy biodiesel and how to get started




MARINE SOY BIODIESEL
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Soybean Basics



MARINE SOY BIODIESEL

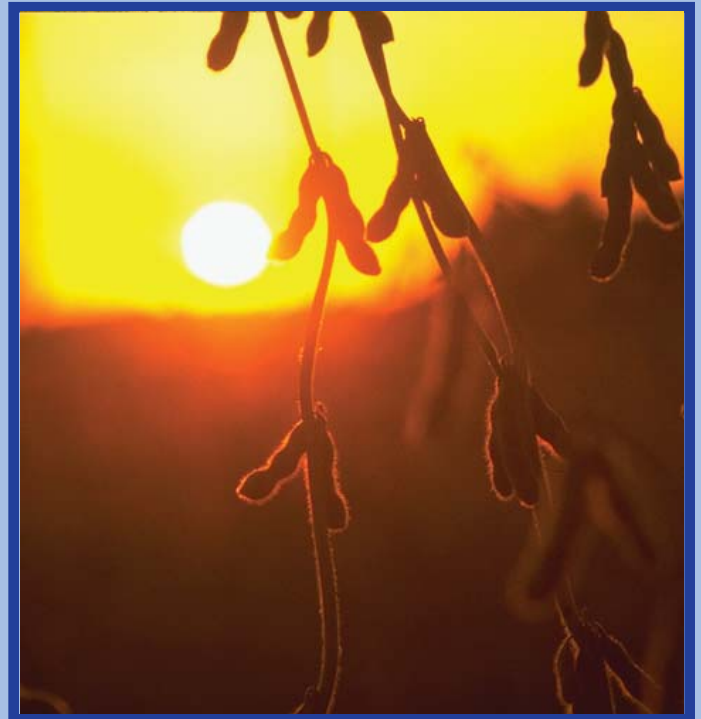
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What is biodiesel?

Biodiesel is an alternative fuel produced from domestic, renewable resources such as soybeans, which can be used in unmodified diesel engines with the current fueling infrastructure. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. It can be used in compression-ignition (diesel) engines without modifications. Its physical and chemical properties, as it relates to operation of diesel engines, are similar to petroleum-based diesel fuel.

Throughout this publication we've used "biodiesel" and "soy biodiesel" interchangeably.

Biodiesel is an alternative fuel which can be used in engines without modifications.



From: United Soybean Board/Soybean Checkoff

Biodiesel blends

Biodiesel can be used as a pure fuel or blended with petroleum in any percentage. Neat (100 percent) biodiesel is referred to as B100. Biodiesel blends are denoted as "BXX" with "XX" representing the percentage of biodiesel contained in the blend (i.e.: B20 is 20% biodiesel, 80% petroleum diesel). The most commonly used blends are B2 and B20. B100 is available across the state for straight use or to use in blends.

B20 has demonstrated significant environmental benefits with minimal increase in cost for fleet operations and other consumers. Due to its positive attributes, B20 is the most widely recommended blend.



DID YOU KNOW... RECREATIONAL BOATS CONSUME 95 MILLION GALLONS OF DIESEL FUEL ANNUALLY.

Engine Performance



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Performance Review

Biodiesel performs similar to petroleum diesel in terms of power, torque, and fuel economy. One of the major advantages of soy biodiesel is it can be used in existing engines and fuel injection equipment. Soy biodiesel has a higher cetane number than petroleum diesel fuel. In over 50 million miles of on-the-road, countless marine, and off-road applications, soy biodiesel exhibited similar fuel consumption, horsepower, torque, and haulage rates as petroleum diesel fuel.

Cold Flow Properties

As with any diesel fuel, cold flow properties are important. B20 soy biodiesel will increase the cold flow properties (cold filter plugging point, cloud point, and pour point) of petroleum diesel approximately two to ten degrees Fahrenheit. The solutions for this potential issue are the same as with low-sulfur #2 diesels (i.e. blending with No. 1 diesel, utilization of fuel heaters, and storage of the vehicle in or near a building). Soy biodiesel appears to be unaffected by conventional pour point depressants.



Engine Compatibility

Over time, biodiesel may soften and degrade certain types of elastomers and natural rubber compounds typically found in older vehicles. Precautions are needed when using high percentage blends to ensure the existing fueling system, primarily fuel hoses and fuel pump seals, do not contain elastomer compounds incompatible with biodiesel.

DID YOU KNOW... BIODIESEL IS ALREADY BEING USED AS A VIABLE ALTERNATIVE FUEL FOR ALL TYPES OF DIESEL POWERED VESSELS, SUCH AS TRAWLERS, COMMERCIAL SHIPS, RESEARCH VESSELS, THE COAST GUARD FLEET, SAILBOATS WITH AUXILIARY ENGINES, AND MORE!

Lubricity Benefits

With the lubricity of conventional diesel fuel being scrutinized due to processing changes required to reduce the sulfur and aromatic content of diesel fuel, soy biodiesel use has been demonstrated to be a benefit. Soy biodiesel provides significant lubricity improvement over petroleum diesel fuel. Lubricity results of soy biodiesel and petroleum diesel, using industry test methods, indicate there is a marked improvement in lubricity when soy biodiesel is added to conventional diesel fuel. Even soy biodiesel levels as low as one percent can provide up to a 65 percent increase in lubricity in distillate fuels.

A photograph of a soy biodiesel fuel pump station. The pump is silver and black, with a digital display at the top. A red sign on the pump reads "NO SMOKING". Below that, a red sign reads "DIESEL". There is also a sign that says "Biodiesel". A blue hose is attached to the pump. The background is white.

Soy Bio Bet

Particulate Matter

Breathing particulate matter has proven to be a human health hazard. The exhaust emissions of particulate matter from B20 are about 12 percent lower than overall particulate matter from petroleum diesel.

Hydrocarbons

The exhaust emissions of total hydrocarbons, a contributing factor in the localized formation of smog and ozone, are on average 20 percent lower for soy biodiesel than petroleum diesel fuel.

Effects on the Country

The use of soy biodiesel could strengthen the local economy and reduce our dependence on foreign petroleum products. Since U.S. soybeans are plentiful, petroleum prices are unstable, and oil-producing countries that may be volatile, any alternative source of energy would be beneficial to our country's energy security.

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Fuel

Particle Emissions

Sulfur oxides and sulfates are reduced by 20% with B20 use. Dangerous particulate emissions are also drastically reduced more than those produced by conventional petroleum diesel fuel.

Environmental Impact

Biodiesel (B100) reduces greenhouse gases by nearly 80 percent. Since soy biodiesel is a renewable fuel derived from organic materials, it also reduces the net amount of carbon dioxide in the atmosphere. Soy biodiesel helps preserve and protect natural resources. According to the United States Department of Agriculture and Department of Energy, for every one unit of energy needed to produce soy biodiesel, 3.24 units of energy are gained. Neat soy biodiesel (B100) also is nontoxic and biodegradable.

For more detailed reports and study results visit www.biodiesel.org or contact the United States Department of Energy.

Clean Air Act

Soy biodiesel (B20) is the only alternative fuel to have successfully completed the EPA's Tier I and Tier II Health Effects testing under the Clean Air Act. Tier I testing demonstrated soy biodiesel's significant reductions in most currently regulated emissions and most unregulated emissions, including those related to cancer and lung disease. Tier II testing demonstrated soy biodiesel is nontoxic and poses little or no health risk to humans.

Global Warming

By reducing carbon dioxide emissions by 70 percent, soy biodiesel (B100) was shown in a study by the United States Department of Energy and United States Department of Agriculture to be an asset in reducing the effects of diesel exhaust on global warming.

Health Effects

United States Department of Energy reports B20 soy biodiesel reduces the risk of cancer from diesel exhaust particulate matter by up to 94%. Soy biodiesel also significantly reduces asthma, allowing people to breathe easier.

Carbon Monoxide

The exhaust emissions of carbon monoxide from B20 soy biodiesel are on average 12 percent lower than carbon monoxide emissions from diesel.





Standards & Warranties



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ASTM Standard

The American Society of Testing and Materials (ASTM), the premier standard-setting organization in the United States, issued a fuel specification for biodiesel (B100) as Specification D-6751 for all biodiesel bought and sold in the United States as of March 2002. This standard protects customers from poor products and reduces the cost of buying and selling biodiesel. The specification streamlines the procurement process and provides information to the engine community and customers to assure trouble-free operation with biodiesel blends.

Soy Biodiesel Costs

Biodiesel blends typically cost slightly more than diesel fuel. The cost difference is expected to shrink. Rising petroleum costs, new EPA regulations requiring reduced sulfur content in diesel, and a federal tax incentive for blenders will help lower the cost difference for consumers. By applying for grants sponsored by the Michigan Department of Labor & Economic Growth, Energy Office, or others, you may be eligible to receive funding to offset the additional cost incurred by using soy biodiesel.

BQ-9000 Program

BQ-9000 is the National Biodiesel Accreditation Program for the accreditation of producers and marketers of biodiesel fuel. It is a cooperative and voluntary program. The program is a unique combination of the ASTM standard for biodiesel, ASTM D-6751, and a quality systems program that includes storage, sampling, testing, blending, shipping, distribution, and fuel management practices.



BQ-9000 is open to any biodiesel manufacturer, marketer, or distributor of biodiesel and biodiesel blends in the United States and Canada.

Warranty Coverage

Diesel engine manufacturers (OEMs) neither approve nor prohibit the use of biodiesel fuels. OEMs only warrant materials and workmanship. Failures resulting from the use of any fuel are not considered factory defects. Check with your OEM for their guidelines on the level of biodiesel that they recommend for use with their engines.

DID YOU KNOW... BIODIESEL USE HELPS BOAT SURFACES STAY CLEANER.



Getting Started



Testimonials

In Michigan's Upper Peninsula, Cedar River State Harbor provides a B5 option to their boating customers. "Once boaters find out how much they like burning biodiesel in their diesel engines, they won't want to use anything else. Our first year selling B5 biodiesel at the dock, it outsold regular diesel almost 2 to 1. It's hard to deny that the health and environmental benefits of biodiesel just make it a better choice," said Christine Cope, Wells State Park/ Cedar River State Harbor Unit Supervisor.

Gary King of the Indian River Marina in Delaware said, "Our year-round use of B20 is in keeping with our commitment to clean water and the Clean Marina Initiative."

Dennis Donahue, Marine Superintendent with NOAA's Lake Michigan Field Station in Muskegon said, "Environmentally friendly research vessels are better suited to tread lightly on the ecosystems they help research. Here at the Great Lakes Environmental Research Lab, we have a commitment to stewardship of the environment and demonstrate that by being the first modern U.S. research vessel to operate free of petroleum products and run on biodiesel and other biobased products." In six years, NOAA's Great Lakes Environmental Research Lab has used over 26,000 gallons of B100 in its three research vessels.

What's Earthrace?

Earthrace is a marine vessel that will race around the world in less than 65 days and is fueled by B100. Earthrace is committed to the vision of a world using fuel produced from sustainable sources by demonstrating the power, reliability and environmental safety of biodiesel. Biodiesel is one of the keys to our transportation needs.

No Modifications

Soy biodiesel requires no modifications to storage or handling facilities. Like petroleum diesel, soy biodiesel should be stored in a clean, dry, dark environment. Temperature extremes should be avoided. Acceptable storage tank materials include mild steel, stainless steel, fluorinated polyethylene, and fluorinated polypropylene. Soy biodiesel has a solvent effect, which releases the deposits accumulated on tank walls and pipes, and initial precautions should be taken to allow for this.

Getting Started

1. Consult with the Michigan Department of Labor & Economic Growth Energy Office about possible funding to offset costs for offering soy biodiesel fuel.
2. Contact your local marine fuel supplier to request soy biodiesel fuel.
3. Provide your local newspaper with a press release about your use of soy biodiesel fuel.
4. For public relations help, contact:
Michigan Soybean Promotion Committee
Phone: 989.652.3294
E-mail: soyinfo@michigansoybean.org
Web site: www.michigansoybean.org



Contact Information



Michigan Soybean Promotion Committee

P. O. Box 287
Frankenmuth, MI 48734
Phone: 989.652.3294
E-mail: soyinfo@michigansoybean.org
www.michigansoybean.org



National Biodiesel Board

P. O. Box 104898
Jefferson City, MO 65110-4898
Phone: 800.841.5849
www.biodiesel.org

Michigan Biomass Energy Program

Michigan Energy Office
Dulcey Simpkins, Coordinator
Phone: 517.241.6223
E-mail: dlsimpk@michigan.gov

Indian River Marina

Gary D. King, Marina Manger/Superintendent
39415 Inlet Road
Rehoboth Beach, Delaware 19971
Phone: 302.227.3071
E-mail: Gary.King@state.de.us
www.destateparks.com
(follow the links to Indian River Marina)

NOAA's Lake Michigan Field Station

Dennis Donahue, Marine Superintendent
Phone: 231.755.5173
E-mail: dennis.donahue@noaa.gov

Wells State Park/Cedar River State Harbor

Christine Cope, Unit Supervisor
Phone: 906.630.3743
E-mail: copec@michigan.gov



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