



# Consumer Guide to Biodiesel

Vehicles with diesel engines offer increased fuel economy and power over many traditional gasoline-powered vehicles. Especially when used in combination with biodiesel fuel, it is a green transportation choice.



**DID YOU KNOW?**



Biodiesel is a renewable biodegradable, liquid fuel manufactured domestically from vegetable oils, animal fats, and/or recycled restaurant grease. Like petroleum diesel, biodiesel is used to fuel compression-ignition engines. Biodiesel's physical properties are similar to those of petroleum diesel that is a cleaner-burning renewable alternative.

## Biodiesel Blends

Biodiesel can be blended and used in many different concentrations. B20 (20% biodiesel, 80% petroleum diesel) is a common biodiesel blend in the United States for most applications. But there is also B100 (pure biodiesel), B5 (5% biodiesel, 95% petroleum diesel), and B2 (2% biodiesel, 98% petroleum diesel). You may have heard of renewable diesel, also called "green diesel." This fuel is distinct from biodiesel. Although most renewable diesel is produced from vegetable oil, animal fat, and waste cooking oil, biodiesel has different fuel than petroleum diesel. Renewable diesel, on the other hand, behaves nearly identically to petroleum diesel and meets the same fuel quality specifications. Contrary to some reports, straight vegetable oil is not biodiesel and is not a legal motor fuel. It does not meet biodiesel fuel specifications or quality standards.

## Biodiesel Performance

Engines operating on B20 have similar fuel consumption, horsepower, and torque to engines running on conventional diesel. While a blend of diesel fuel and biodiesel, such as B20, generally has little impact on fuel economy, it has a higher ignition value and ability to lubricate the fuel systems better. This allows for easier combustion and functionality of the fuel system. The performance of biodiesel blends in cold weather varies depending on the amount of biodiesel in the blend and the types of fuel used in the blend. In general, blends with smaller percentages of biodiesel perform better in cold temperatures. All traditional diesel and biodiesel blends can have compounds



that crystallize in very cold temperatures, causing operability issues. However, fuel blenders have several options available to improve the cold-flow properties of biodiesel blends, including adding flow improvers, blending in more No. 1 diesel, or blending in less biodiesel. Users should consult with their fuel provider with questions about the cold weather performance of their fuels.

Diesel fuel burns as cleanly as B20 in vehicles with 2010 model engines and newer. In older engines, biodiesel blends may offer some additional emissions reduction benefits, particularly for particulate matter, carbon monoxide, and unburned hydrocarbons. The amount of the benefit depends on the engine's emission control technology, the age of the engine, the percentage of biodiesel in the blend, and how the vehicle is operated. The oldest engines and technologies will reap the greatest emissions benefits from the use of biodiesel oils and waste fats, greases, and oils—in defining biodiesel as an advanced fuel on the other hand, it behaves nearly identically to petroleum diesel and meets the same fuel quality specifications.

### **Are there any downsides to using biodiesel?**

Studies of B20 and lower-level blends in approved engines have not shown any negative long-term effects. However, biodiesel has a solvent effect. It cleans your vehicle's fuel

system but could release deposits accumulated from previous diesel fuel use.

The release of deposits may initially clog filters, so users should check for and replace clogged fuel filters. Once the build-up is eliminated, user should return to their regular replacement schedule. This issue is less common with B20 and lower-level blends.

### **FURTHER READING**

For more information, see the fact sheet, "Straight Vegetable Oil as a Diesel Fuel?"

[www.nrel.gov/docs/fy14osti/54762.pdf](http://www.nrel.gov/docs/fy14osti/54762.pdf)

You can also find general and manufacturer-specific information on the National Biodiesel Board Website.

[www.biodiesel.org](http://www.biodiesel.org)

Use the Alternative Fueling Station Locator to find biodiesel stations that offer blends of B20 and higher.

<https://afdc.energy.gov/stations#/find/nearest>