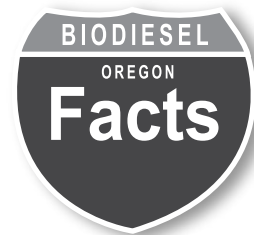


# BIODIESEL

A BETTER CHOICE FOR BUSINESS

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## Engine Performance

A major benefit of biodiesel is that it can be used in diesel engines and fuel injection equipment with little to no impact on operating performance. In more than 50 million miles of in-field experience, a blend of 20% biodiesel and 80% petroleum diesel (B20) showed similar fuel consumption, horsepower, torque, and haulage rates compared with conventional diesel.<sup>1</sup> Hundreds of truck fleets across the country are now using B20 in all types of vehicles and driving conditions.

### LUBRICITY

All diesel fuel injection equipment has some reliance on the fuel itself as a lubricant, especially for the proper functioning of rotary and distributor type fuel injection pumps. In these pumps, moving parts are lubricated not by engine oil, but by the fuel as it moves through the pump. Other diesel fuel systems, including unit injectors, unit pumps, and in-line pumps are partially fuel lubricated.

The "lubricity" of the fuel is an indication of the amount of protection provided by the fuel from the wear or scarring that occurs between two metal parts as they come into contact with each other. Low lubricity fuel may cause high wear and scarring as well as premature breakdown.

With the introduction of ultra low sulfur diesel, many of the compounds in diesel that formerly provided this needed lubricity to the fuel, including the sulfur itself, have been removed. To address this risk, many fleet managers are choosing B20 since biodiesel has superior lubricating qualities. Its high lubricity often provides reduced wear and longer component life, thereby enhancing engine performance, prolonging engine life, and decreasing fleet operating costs.<sup>2</sup>

### CETANE

Cetane measures the readiness of a fuel to auto-ignite after it has been injected into a diesel engine, and is comparable to the octane rating for gasoline. Higher cetane fuels have shorter ignition delay periods than lower cetane fuels. Fuels with a ce-

tane rating lower than the engine's minimum requirements can cause rough engine operation and may be more difficult to start, especially in cold weather or at high altitudes. In addition, low cetane fuels may increase engine deposits, resulting in more smoke, increased exhaust emissions, and greater engine wear.

Biodiesel has a higher cetane rating (47-70) than petroleum diesel (42-44) and thus will boost the cetane rating of biodiesel/petroleum blends. The high cetane rating leads to a more complete combustion of the fuel. It also results in better self-ignition of the fuel for easier starting, smoother running engine performance, and quieter, more reliable operation. This higher cetane rating also improves engine efficiency, can improve the power output of the engine, and results in less white smoke.<sup>3</sup>

### ENERGY CONTENT

Study results of energy content in biodiesel and how it impacts performance have varied and research into this area continues. Current consensus is that high level blends of biodiesel may contain a lower energy content than petroleum diesel. Depending on the load and driving conditions, the difference in energy content between biodiesel and petroleum diesel may be noticeable when using B99. As the biodiesel blend level is lowered, any effects due to reduced energy content diminish. For B20, the difference in power, torque, and fuel economy should be between 1% and 2%, depending on the diesel with which it is blended. Most users report little performance difference between B20 and #2 diesel. Blends of B5 or less do not cause noticeable differences in performance.<sup>4</sup>

<sup>1</sup> National Biodiesel Board website, [www.nbb.org](http://www.nbb.org)

<sup>2</sup> U.S. Department of Agriculture, "Lubricity of Components of Biodiesel and Petrodiesel." National Biodiesel Board website, [www.nbb.org](http://www.nbb.org).

<sup>3</sup> University of Idaho website, [www.uidaho.edu/bioenergy](http://www.uidaho.edu/bioenergy)

<sup>4</sup> U.S. Department of Energy, "Biodiesel Handling and Use Guidelines." University of Idaho website, [www.uidaho.edu/bioenergy](http://www.uidaho.edu/bioenergy)

Go to [www.biofuels4business.com](http://www.biofuels4business.com) for information on: Biodiesel distributors • Maintenance procedures • Engine performance • Fleet success stories • Using B20 and B99 blends • Fuel quality • Air quality and health benefits • Engine warranties

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