



State of Oregon Department of Environmental Quality

Biodiesel 101

Contact: OregonCleanFuels@deq.state.or.us

700 NE Multnomah Street Suite 600 Portland, OR 97232

What is Biodiesel?

Biodiesel is a renewable, biodegradable fuel produced by chemically altering fats and oils from plants and animals in a way that meets the ASTM D6751 standard for diesel. Biodiesel can be made from many waste or renewable materials including: animal tallow, fish waste and algae, used cooking oil, inedible corn oil, soybean oil, canola oil and others. A typical facility can switch between or run multiple different materials.

Is Biodiesel the same as Renewable Diesel?

While they can be made from the same materials biodiesel and renewable diesel have different manufacturing processes that result in products with different molecular structures - biodiesel is a methyl-ester and renewable diesel is a hydrocarbon. The difference in the chemical properties of biodiesel is what limits the amount that can be blended with petroleum diesel which is also a hydrocarbon. The sizes of the molecules in biodiesel and petroleum diesel are about the same, but they differ in chemical structure and properties.

Biodiesel is rarely used in its pure form because it tends to thicken and "gel up" at low temperatures which does not happen with petroleum or renewable diesel. It's typically blended with petroleum diesel and is designated by the amount of biodiesel mixed in, such as B5 (5% biodiesel and 95% petroleum) or B20 (20% biodiesel and 80% petroleum). It can also be blended with renewable diesel such as B20R80 (20% biodiesel and 80% renewable diesel) or all three products such as B20R20 (20% biodiesel, 20% renewable diesel, and 60% petroleum).

What are the emissions benefits from using biodiesel?

Using biodiesel can cut lifecycle greenhouse gas emissions up to 78% depending on the materials it is made from. Waste products such as tallow and used cooking oil have the greatest reductions while vegetable oils are slightly less. Biodiesel lowers tailpipe emissions such as particulate matter, carbon monoxide and total hydrocarbons. Nitrogen oxide emissions increase slightly but biodiesel can be used safely in areas in attainment of the ozone standards.

What are the other benefits from using biodiesel?

Once considered a fringe fuel, biodiesel production has grown significantly in the last decade. International, national, and state level low carbon fuel and renewable fuel policies will continue to incentivize its growth into the future. Biodiesel has gained in popularity largely because of its lower carbon footprint but also because it:

- has higher lubricity than petroleum diesel
- reduces diesel particulate matter, known to cause cancer and other negative health impacts
- is made from products that would otherwise be sent to a landfill
- can be locally produced and at relatively smaller scales that require less capital

Is biodiesel available in Oregon?

Biodiesel is widely produced globally and billions of gallons are available to Oregon. In addition, biodiesel is produced locally in Oregon and throughout the Pacific Northwest. Most of the biodiesel that is consumed in Oregon is made from used cooking oil and canola oil.

How is biodiesel treated under the Oregon Renewable Fuel Standard?

The Oregon Renewable Fuel Standard requires that all diesel sold or distributed in Oregon contain 5% biomass-based diesel. Both biodiesel and renewable diesel are considered biomass-based diesel and satisfy this requirement.

How is biodiesel treated under the Portland Renewable Fuel Standard?

The [Portland Renewable Fuel Standard](#) requires that all diesel sold or distributed in Portland for on-road vehicles contain 5% biodiesel. Additionally, the City of Portland requires that at least 50% of the volume of biodiesel they sell or distribute must satisfy requirements for qualifying feedstocks which include canola, flax, sunflower, safflower and used cooking oil. Of note, renewable diesel does not satisfy this requirement.

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.