BIODIESEL

What is Biodiesel

Biodiesel is an alternative fuel formulated exclusively for diesel engines and can be manufactured from vegetable oils, animal fats, or recycled restaurant grease. Biodiesel can be used alone, or blended with hydrocarbon-based diesel (diesel) in any proportions. Biodiesel blends can also be used as heating oil.

Blends of biodiesel and conventional hydrocarbon-based diesel (diesel) are sold for use in the retail diesel fuel marketplace. Much of the world uses a system known as the "B" factor to define the amount of biodiesel in any biofuel blend:

- **B-100** = 100% biodiesel
- **B-20** = 20% biodiesel + 80% diesel
- **B-5** = 5% biodiesel + 95% diesel
- **B-2** = 2% biodiesel + 98% diesel

Advantages

There are several advantages for using biodiesel:

- **Cleaner than diesel**: Biodiesel reduces emissions of carbon monoxide, carbon dioxide, sulfur dioxide and particulate matter.
- **Renewable**: It's plant based, therefore what is used can be re-grown.
- **Support of local agriculture**: It's another way to support your farmer.
- **Natural Lubricant**: Biodiesel is a natural lubricant.

Disadvantages or Problems

There are several disadvantages for using biodiesel:

- Water issues: Biofuel is highly hygroscopic, meaning it readily absorbs water from moisture in the air. Water contamination in diesel fuel is of particular concern as it can lead to the corrosion of steel components and the promotion of microbial growth. Biofuel (B-100) contains 20 to 25 time more water that diesel. One bucket of diesel (D-2) may contain 60pppm of water but one bucket of B-100 biofuel may contain 1200 to 1500ppm. In addition to the potential microbial growths that the excess of water may generate, if biodiesel is not treated, high corrosion damages to the metal parts of engines and injection system can be generated.
- Gelling in the cold**:** The use of biodiesel blends during Winter increases the opportunity of the fuel to gel. Requires special handling in cold weather.
- Slightly less energy content than diesel fuel**:** One study found that during atomization biodiesel and its blends produced droplets that were greater in diameter than the droplets produced by traditional diesel. The smaller droplets were attributed to the lower viscosity and surface tension of traditional diesel. It was found that B-100 had the greatest spray penetration, this was attributed to the greater density of B-100. Having a

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greater droplet size can lead to inefficiencies in the combustion, increased emissions, and decreased horse power. In another study it was found that there is a short injection delay when injecting biodiesel.

- Rubber deterioration: Tends to deteriorate non-synthetic or natural rubber fuel system parts (hoses, seals).

The following pictures will show the damages caused by 600+ hours of use of (B-80 and B-100) biodiesel.



The following pictures will show the damages caused by 200+ hours of use of B-100 biodiesel.



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