

## Notes on BIODIESEL

**Biodiesel fuels** are methyl / ethyl based oxygenates derived from vegetable oils, animal fats, and cooking oils. Biodiesel is classified as triglyceride oil, is biodegradable, and decreases emissions which makes them environmentally friendly. Their properties are similar to diesel fuels, as opposed to gasoline fuels, and are capable of use in compression ignition type engines i.e. diesel.

**Biodiesel fuels** have a lower energy content of about 90% as compared to diesel fuel which makes it somewhat less efficient, but its higher viscosity range helps to offset this to a final energy loss of about 7-10% as compared to diesel fuel. The cetane ratings are slightly higher in biodiesel, and have improved lubricity as compared to standard diesel fuel. Areas of concern when operating with biodiesel include:

- Limited low temperature operation due to the increased cloud point of the fuel. In B20 biodiesel the cloud point can increase to +15<sup>0</sup>F, causing filter plugging and fuel gelling in cool weather.
- Decreased fuel economy due to the ‘heat content’ (lower BTU content) of the biodiesel.
- Biodiesel, due to its biodegradability, is more water absorbent than fossil fuels. Water has to be tightly controlled in order to avoid severe engine fuel system problems, fuel problems, and microbial growth which can grow explosively in biodiesel/water environments.
- Biodiesel fuel may cause a chemical reaction with lube oil resulting in oil sludging.
- Decreased thermal and oxidation stability which can cause filter plugging and injector coking, leaving deposits. This is especially so in electronic fuel system engines which operate at higher temperatures. The oxidation stability problem may accelerate fuel oxidation, thereby causing degradation in the fuel with resultant long term storage problems.
- The instability of biodiesel causes increased acidity over time that can give increased corrosion.
- Hardening/cracking & swelling of some elastomer seal types has been observed in fuel systems.

The challenges presented by biodiesel can be offset by mixing with fossil diesel fuels, where a (B5) 5% mixture of biodiesel to 95% fossil diesel fuel is generally considered ‘safe’, and where a (B20) 20% mixture of biodiesel to 80% fossil diesel fuel is considered to be an ‘alternate fuel source’ which may provide tax credits under some particular Government sponsored environmental program.

Diesel engine manufacturers, by and large, have warranty disclaimers to the effect that “The use of products such as biodiesel is at the discretion of the end-user. Any engine performance problem or failure attributed to biodiesel would not be recognised as the responsibility of the ‘manufacturer’”.

### **Biodiesel Solutions:**

After considerable field testing LubeCorp has found that their **Premium Diesel Plus Fuel Conditioner**, mixed with the biodiesel at a ratio of 0.002% or 2 ml per Litre of biodiesel fuel, will correct all the limitations in the biodiesel including a mix up to B20, and provide a net fuel savings of 10 to 15% after paying for the product, as found by independent tests run by several trucking companies.

**LubeCorp Premium Diesel Plus Fuel Conditioner is environmentally friendly; reduces fuel consumption by 15%, increases cetane by 9 > 13 points, significantly cleans-up exhaust emissions, and notably extends equipment life.**