

LUBE

TECHNI-GRAM



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IS BIO-FUEL THE “CURE-ALL” FOR DIESEL OWNERS?

Are you confused by all of the commotion and hype over the various fuel products being promoted in the scramble to meet lower diesel engine emissions? Don't feel alone, as a lot of information and *misinformation* surrounding the technologies the various promoters of “future fuels” advertise.

Basically, **bio-fuel** is defined as 100% bio-fuel and is made from any fat or vegetable oil...typically soy bean oil. It contains no petroleum but can be blended with diesel fuel at any level...a typical blend is 20%. The term **bio-diesel** is generally used to define a blend of bio-fuel and petroleum diesel. Bio-diesel is a viable alternative fuel for diesel engines and it can have many positive attributes. Bio-diesel does, however, have numerous *negative attributes* that promoters of this type of fuel technology do not advertise and this is the purpose of this publication:

Potential Concerns

Engine Power/Fuel Economy Loss

- Bio-diesel may decrease engine power output and increase fuel consumption
 - Heating value of bio-diesel is lower than petroleum diesel
 - Oxygen content of bio-diesel is higher

NOx Emissions

- Bio-diesel may increase NOx's
 - Depends on engine design and base stock of bio-diesel
 - Increase in unsaturated fats typically yields higher NOx
 - Adding cetane improver can lower NOx.
- Effects comparable to percentage of bio-diesel used.

Component Compatibility

- Hoses
 - 100% Bio-fuel may adversely effect some elastomers such as natural or nitrile rubber over time and could deteriorate hoses
- Metal



... to keep it running

- Bio-fuel and bio-diesel blend will form high sediment levels when in contact with brass, bronze, copper, lead, tin and zinc

Filter Plugging

- Bio-diesel is a mild solvent
- Bio-diesel may loosen sediments and accumulated material on fuel system surfaces
- May need to replace fuel filters more frequently at start up

Viscosity

- Bio-diesel's typically has higher viscosity than petroleum diesels
- Blending bio-fuel with petroleum diesels will increase the viscosity of the base fuel

Storage Stability/Corrosion

- Most bio-diesel good for only six (6) months in tanks
 - Air (containing moisture) enters tank through vent pipes
 - Air increases oxidation (breakdown) of fuel and forms insoluble materials
 - Free water accelerates corrosion and fuel degradation
 - Presence of water can promote microbiological contaminants
 - Additives are needed to improve stability, minimize corrosion and deter microbiological growth

Cold Flow

- Heavier viscosity and increased oxygen content of bio-diesel hinder cold flow

Injector Deposits

- Bio-diesel may increase injector deposits
- More viscous bio-diesels typically yield more injector deposits

As previous stated, bio-fuel is a viable alternative fuel for diesel engines...especially where legislation dictates that it be used (federal, state and local municipalities, mass transit and public school accounts, etc.)... and it can have positive attributes in the scramble to meet lower diesel engine emissions. But, as shown above, the use of bio-diesel alternative fuels can leave fleet managers with a variety of trade-off problems. Fortunately, fleet managers can rely on SWEPCO's 501 Premium Diesel Fuel Improver to optimize fuel efficiency, reduce emissions and prevent the operational problems throughout the entire life of their equipment. SWEPCO 501 Premium Diesel Fuel Improver and SWEPCO 501 PDI "Winter Formula" pay dividends to the fuel users that far exceed their nominal cost.