

Bob's Inc.  
Downs, KS

## PREMIUM DIESEL VS STRAIGHT ULSD

"When quality and performance count...count on Bob's Inc."

### Why should you use a Premium Fuel? Is it really worth the added cents per gallon?

**The need to use a premium diesel fuel supplement is now more important than ever. After understanding the facts, common sense will tell you that it will cost you not to use a premium fuel.**

Diesel fuel quality can vary dramatically from source to source and even day to day. Inconsistent fuel quality can result in customer dissatisfaction over equipment life and performance. In addition, most diesel fuels are not designed for use in off-road equipment. It is recommended that farm and large off road equipment use premium fuel all year according to OEM websites. Owners of on-road equipment that require ULSD have to look at the benefits closely due to tighter clearance on fuel systems.

In general, ultra low-sulfur and bio-diesel fuels are less stable and they degrade in quality much sooner. This degradation process varies widely from one fuel source to another as fuel **oxidation** occurs (which oxygen in a small amount of dissolved air attacks reactive compounds in the fuel). Many factors to consider are grades of crude, refinery processing, bio-diesel feed stocks and bio-diesel processing. Less stable fuel results in the formation of gums that can lead to injector deposits or particulates that can plug fuel filters or the fuel injection system. In addition, ultra low-sulfur diesel is a

poorer solvent and therefore tends to drop out more sediment and sludge than high-sulfur diesel.

Carbons form deposits in the nozzle area of injectors – the area exposed to high cylinder temperatures. The extent of deposit formation varies with engine design, fuel composition, lubricant composition, and operating conditions. These deposits may affect the injector spray pattern and fuel-air mixing process. In some engines, this may result in decreased fuel economy and increased emissions.

Filtration efficiency on most diesel fuel systems has been cut in half over the past five years. Cummins had required a 25-micron filter, but now calls for 10 microns, absolute. Caterpillar and Detroit Diesel have both gone from 20-micron fuel filters down to 8- or 10-micron absolute filters. In many cases, tighter filters allow oxidized fuel to clog the fuel system more easily. In addition asphaltenes are increasingly becoming an issue.

**Energy Content:** In general, the processing required to reduce sulfur to 15 ppm also reduces the aromatics content and density of diesel fuel, resulting in a reduction in energy. ([www.chevron.com](http://www.chevron.com))

**Bacteria in fuel** has become a factor in both ULSD and bio-diesel blends. Reduced sul-

fur and oxidation has increased the number of cases reported. (see second page)

#### What benefits will I get with a Premium Diesel Fuel Supplement from E.T. Products?

**Detergency** – A Superior Pass in the industry standard Cummins L-10 test. This is the highest rating available. This rating is obtained by having a high quality detergent package with higher percentages of detergency. Just having detergent is not enough to offer the correct protection every time. This insures clean injectors and a uniform spray pattern that allows fuel to completely combust. This creates an increase in efficiency that leads to more MPGs.

**Lubricity** that is reducing the wear and tear of your internal components. The industry uses an HFFR test to measure lubricity in fuels. The ASTM specification requires fuel to measure 520 microns or below. Most racks will sell fuel at this minimum. The EMA-OEMs requires a measure of 460 microns to adequately lubricate the fuel systems. E.T. Products lubricity improver will measure below 460 microns and consistently measures in the 300s.

**Increased Cetane** helps initiate fuel combustion and shorten the ignition delay period. This decreases pressure build up, provides for smoother engines, reduces white smoke, increased power

and improved fuel economy. In a test comparing an engine running fuel with a cetane improver vs. engine not running cetane improver, "After 1,000 hours of operation, the engine running on fuel treated with cetane improver exhibited lower engine wear and deposits than the engine run without cetane improver." <http://www.sae.org/technical/papers/981364>

**Thermal Stability** additives typically work by blocking one step in a multi-step reaction pathway. Best results are obtained when the additive is added as soon as possible to fuel. E.T. Products includes a stability additive that helps reduce formation of gums and insolubles.

**Anti-oxidants** work to eliminate a complex set of chain reactions which lead to less stable and degradation in the fuel.

**Corrosion Inhibitor** compounds that attach to metal surfaces and form a barrier that prevents attack by corrosive agents.

**Demulsifiers** that break up emulsions and allow the fuel and water phases to separate for easy removal.

Regular use inhibits the growth of fuel bacteria by reducing the moisture available in the fuel.

*The EPA does not allow fuel additive packages to contain a biocide that kills bacteria. It must be shipped separately.*



# TAKE BACK YOUR FUEL FILTER LIFE!

Are you tired of spending \$50-\$100 on your fuel filters and only getting 5,000 –10,000 miles? Well, we can help you get more life out of your fuel filters, in most cases 3-5 times more.

## Power Max HPFI Anti-Foulant

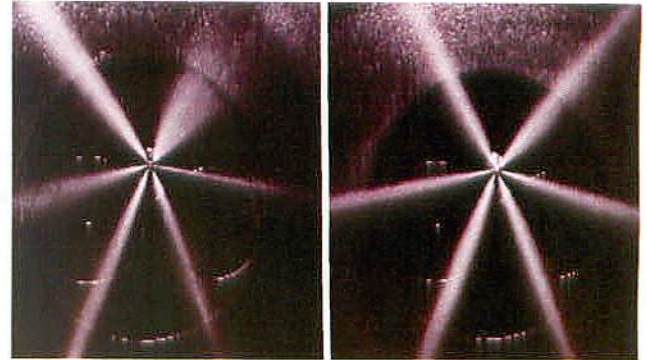
E.T. Products (who has been formulating quality bulk treat additives for more than 30 years) has developed a High Pressure Anti-Foulant (HPFI) in direct response to the performance issues associated with filter and injector plugging surrounding modern diesel engines and Ultra Low Sulfur Diesel Fuel (ULSD).

ULSD was introduced to help reduce emissions by removing sulfur. This reduction requires hydro treating of the fuel. This hydro treating severely affects (among others) the oxidation and thermal stability of the fuel. The lack of oxidation and thermal stability are directly responsible for increased carbon deposits and soot build up.

Although technology has increased the engine performance, the high pressure injection systems, tight clearances, high heat and fuel return rates in these modern engines are more severely impacted by the build up of hydro carbons and soot. The build up of hard carbon around the injectors restricts fuel flow and adversely affects power and performance.

The oxidation process soon forms black soot like deposits in the fuel filter, slowly plugging them. This is a direct result of the ULSD thermally decomposing.

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Diesel Fuel Injectors Flow Patterns

Prior to treatment

After treatment

**Power Max** re-establishes and restores the thermal and oxidative stability so effectively it will completely prevent formation of black sludge.

**Power Max** not only cleans the carbon deposits in fuel injectors, it will extend filter life 3-5 times. Surveys report soot build up on filters as soon as 5,000 miles after filter change. Power Max has shown to extend this life beyond 25,000 miles.

**Power Max** is effective in preventing the rust and corrosion issues now associated with storage tanks.

**Power Max** is formulated with a new age lubricity additive to ensure proper lubrication of fuel system.

Compatible with Mineral based Bio-diesel blends.

BOB'S INC.  
268 W. Hwy. 24,  
Downs, KS 67437  
785-454-6219

