

DIESEL FX: THE ULTIMATE FUEL ECONOMY BOOSTER FOR DIESEL FUEL ON THE MARKET TODAY

DIESEL FX

DIESEL FUEL BOOSTER

POWER UP
LUBRICANTS

Power Up **Diesel FX** is a performance enhanced High Pressure Fuel Injector Antifoulant. **Diesel FX** prevents filter plugging and injector fouling due to extreme pressures and temperatures in today's common rail fuel injection systems. It also increases cetane number, disperses moisture, and contains both a fully synthetic lubricity improver and corrosion inhibitor. Although developed for newer model vehicles, **Diesel FX** can be used in any diesel motor engine. For use in ULSD and Biodiesel blends.

Primary Benefits of Diesel FX:

- Prevents filter plugging caused by thermal stressing within the engine
- Prevents fuel soot and sludge formation, extending fuel filter and injector life
- Cleans and prevents injector deposits in high pressure fuel injection systems
- Increases cetane number 3 to 5 numbers....can increase the Cetane number of diesel fuel up to 10%!
- Provides thermal and oxidative stability
- Improves and maintains fuel economy
- Reduces exhaust emissions
- Enhances lubricity with a fully synthetic non-acid lubricity improver
- Water dispersant to help safely remove water on a gradual basis
- Contains synthetic corrosion inhibitor
- Reduces cost of maintenance and downtime

Specially Formulated To Tackle the Shortcomings of Modern ULSD and Biodiesel

Diesel FX was developed in direct response to the performance issues surrounding modern diesel engines and new age fuels. **Diesel FX** complies with the federal low sulfur content requirements and does not exceed 15ppm.

To understand the benefits of **Diesel FX** it is important to appreciate how recent advances in engine and fuel technology have impacted vehicle performance and fleet maintenance costs. The technology at the core of the modern diesel engine is very sophisticated. Developments like high pressure common rail (HPCR) direct fuel injection have transformed vehicle performance. Today's engines are more powerful and more efficient resulting in lower emissions.

Alongside advances in engines technology we have seen a major shift towards new age fuels. These have been introduced to help reduce the environmental impact of exhaust emissions. Ultra Low Sulfur Diesel (ULSD) contains less than 15ppm sulfur and is a cleaner alternative to traditional diesel fuels. With its use now mandatory under EPA legislation, this fuel has quickly gained acceptance across the United States. It is also used extensively in Canada.

While the introduction of ULSD is to be supported, it should be recognized that the hydrotreating process used to remove sulfur from refinery streams has severe effects on fuel properties.



Removing the sulfur not only affects a fuel's natural lubricity, the process also removes nitrogen and oxygen. Without these naturally occurring components there can be problems with the fuel's low-temperature handling, thermal stability (vulnerability to peroxide formation) and corrosion potential.

This presents the fuel industry with the challenge of extracting maximum performance from today's super-efficient engines while working with more problematic, yet environmentally friendly, ULSD fuels.

Diesel FX was developed to address two critical performance issues: **Injector fouling** and **Fuel Filter Plugging**.

Modern diesel engines operating on ULSD can be negatively affected by deposit contamination because of the extreme heat and high pressures generated by advanced fuel injection equipment.

Call today for more information **1-800-897-6937**
or visit us online at **www.powerupusa.net**



DIESEL FX WAS DESIGNED TO ADDRESS THE ISSUES OF INJECTOR FOULING AND FUEL FILTER



INCREASES THE CETANE NUMBER OF DIESEL UP TO 10%!



Diesel FX will boost the cetane number of diesel fuel up to 10% using the recommended dosage! High cetane number fuels will start to burn earlier in the compression stroke, important for efficient engine operation and emissions.

Fuel Filter Plugging

Under the extreme high temperatures and pressures present in modern diesel engines, ULSD is thermally decomposed in the injection system. This process results in fuel filter plugging. Black soot like deposits form in the fuel filter.

Field tests with heavy duty vehicles show that fuel filter plugging can occur after just 10,000 to 12,000 miles in operation. Filters are often found to be completely blocked with black soot and need replacing.

First, stubborn deposits build up around the injector valve seat and nozzle, inhibiting fuel flow and adversely affecting engine performance. Second, black soot like deposits form in the fuel filter as a result of ULSD being thermally decomposed. The fuel decomposes in the injection system where there are enormous differences in pressure and temperature.

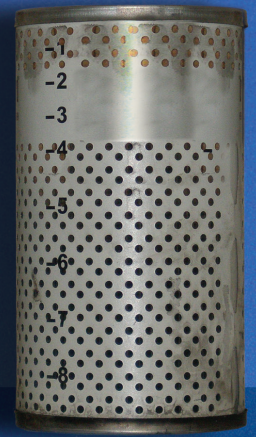
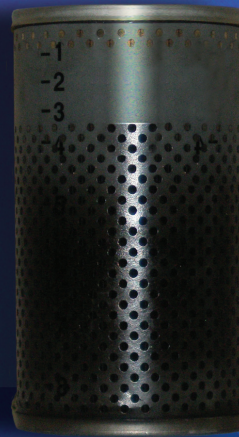
Both injector fouling and fuel filter plugging lead to increased maintenance costs on heavy duty vehicles fitted with modern diesel engines. **Diesel FX** was designed to resolve these problems. **Diesel FX** is an exciting new fuel additive that can help fleet owners and operators reduce maintenance costs. With **Diesel FX** it is possible to push the performance of ultra low sulfur fuels to a new level. The additive not only helps to keep maintenance costs low but also boosts power in today's high-tech engines and helps the environment by reducing harmful exhaust emissions and improving fuel economy

The Ultimate Cetane Number Booster!

Higher cetane number means better ignition quality. It is widely recognized that high cetane number diesel fuels offer a number of benefits that are important for both engine performance and environmental health. Standard diesel fuel has a Cetane number of 40-44. **Diesel FX** will increase the cetane number of your diesel fuel by 3 to 5 numbers, which is important for efficient engine operation and emission control. Increasing cetane number can also reduce NOx emissions.

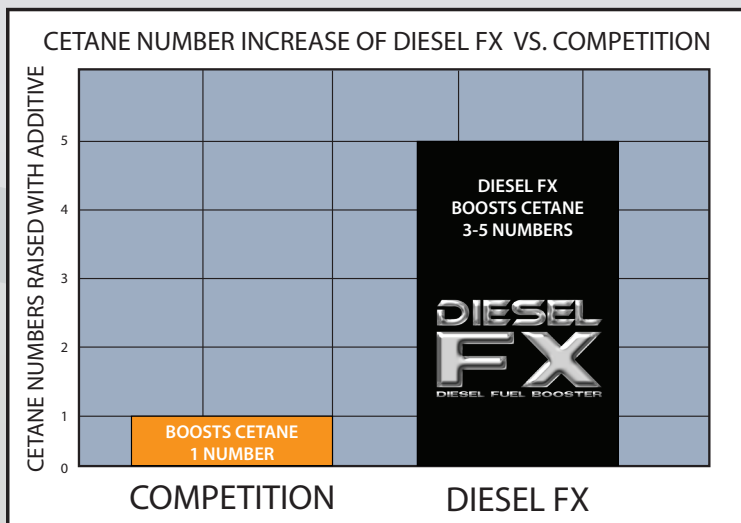
Baseline (no additive) filter after 12,000 miles

Fuel treated with **Diesel FX** after 30,000 miles - recommended preventative maintenance intervals (PMI).



THE SAVINGS ON FUEL FILTERS ALONE COULD COVER THE COST OF USING DIESEL FX!

Using **Diesel FX** reduces fuel filter plugging dramatically. Field tests suggest the filter lifecycle is extended to the scheduled PMI of approximately 30,000 miles from between 5,000 and 12,000 miles. It is estimated that savings on fuel filters alone could cover the cost of using **Diesel FX**!



POWER PLUGGING COMMON WITH TODAY'S MODERN ULSD FUELS AND BIODIESEL BLENDS

Diesel FX is a new fuel additive created specifically to improve the performance of ULSD in newer model vehicles equipped with high pressure fuel injectors. The antifoulant in **Diesel FX** has been designed to combat the problem of fuel filter plugging.

Historically the problem of fuel filter plugging and preventing deposits was combated using traditional detergents but these products are proving less effective in modern heavy duty diesel engines. The treat rates required to have any impact are simply not practical and so the problem of fuel filter plugging must be tackled in a different way.

The antifoulant in **Diesel FX** is a highly innovative multifunctional middle distillate fuel additive that offers a number of important benefits to fleet operators. It prevents the formation of fuel soot by conditioning ULSD to withstand the extreme temperatures and high pressures of today's fuel injection systems.

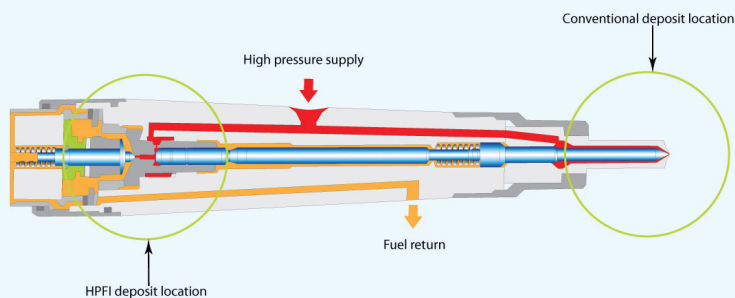
This new fuel additive not only maintains the thermal and oxidative stability of ULSD, it also prevents the formation of black sludge. This is a common problem but it can be made worse in high pressure engine units operating at high temperatures. Contaminants from unburnt fuel and combustion soot build up over time to form a thick black sludge. Sludging ultimately affects performance.

Thanks to **Diesel FX**, it is possible to push the performance of ultra low sulfur fuels to a new level. The additive not only helps to keep maintenance costs low but **Diesel FX** also boosts power in today's high-tech engines and helps the environment by reducing exhaust emissions and improving fuel economy.

Injector Fouling

When used in a modern diesel engine, ULSD can lead to deposit contamination because of the extreme heat and high pressures generated by advanced fuel injection equipment. These injection systems produce temperatures and pressures that are considerably higher than those found in older diesel engines.

Injector fouling is a known issue that affects high performance diesel engines operating on ULSD. Injector fouling occurs when deposits form in the high pressure fuel injection (HPFI) system. Particularly stubborn deposits form at and around the injector valve seat and nozzle. The result of injector fouling is injector drift, power loss and an increase in smoke emissions.



In modern heavy duty diesel engines, traditional detergents at treat rates required to have any impact, are simply not practical, as a means to prevent injector fouling. At the same time, the need to remove deposits in and around the injector valve seat and nozzle has become even more critical to overall performance.

Diesel FX is a highly innovative multifunctional middle distillate fuel additive that maintains the thermal and oxidative stability of ULSD. It offers a number of important benefits to fleet operators.

By conditioning ULSD to withstand the extreme temperatures and high pressures of today's fuel injection systems, the antifoulant in **Diesel FX** helps prevent the formation of fuel soot. **Diesel FX** also cleans up existing injector fouling deposits, returning injectors to "like new" condition within a short time period.

With injectors cleaned and maintained in top condition, operators can expect fewer injector failures and optimum combustion at all times. This makes for a more efficient running engine that benefits from restored power, reduced emissions and better fuel economy.

Diesel FX has been trialed with a number of major fleet operators to see what effect using our additive had on a working fleet in terms of reducing maintenance costs. The results are impressive.

One customer reported no occurrence of injector fouling after starting to use **Diesel FX**. They also noted a substantial increase in fuel economy during the trial period. On the strength of these results, the fleet director recommended the use of **Diesel FX** at all of their company's locations.

"My fuel is gauged big time. My loads are 80% heavy but the odd load will be light. After 6 weeks of using Power Up Diesel FX and running on winter fuel, my last report said that I was getting 6.82mpg. On summer fuel, I was getting 5.5mpg at the best. I could give you any calculation I wanted but this is right off of the IFTA reports because I enter my odometer reading every time that I fuel up..... For my 10,000 - 12,000 miles per month, I need to spend roughly \$100 per month on Diesel FX. That's putting an extra 2 grand in my pocket, in fuel savings. I knew that Power Up products were great before but with the FX, you knocked this baby right out of the park!"

Lawrence Kimoff, Owner/Operator - Calgary, AB



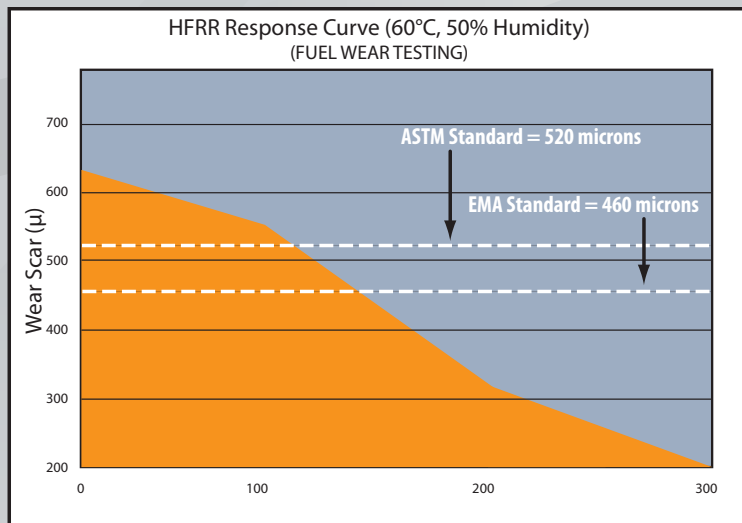
DIESEL FX: INCREASES CETANE NUMBER OF DIESEL FUEL UP TO 10%!

Lubricity

A fuel with adequate lubricity is critical to the satisfactory operation of diesel engines. The engine relies on the fuel to lubricate many of the moving parts within the fuel injection system. ULSD fuels in particular have poor lubricity. The processing required to reduce sulfur 97% in ULSD also removes naturally-occurring lubricity agents. ASTM has incorporated a lubricity requirement as part of the diesel fuel specification, ASTM D975. As a result all diesel fuel must have a High Frequency Reciprocating Rig (HFRR) test result (ASTM D6079) of no more than 520 μ . However, the fuel components that inherently provide protection are removed by the hydrotreating process. This means ULSD typically has poor lubricity.

Diesel FX contains a powerful synthetic lubricant package which reduces friction and wear in the top end of the cylinder, injectors and fuel pump. **Diesel FX** is approved for and surpasses the new standards for diesel fuel and significantly reduces wear and friction below typical levels. Poor fuel lubricity results in increased maintenance costs, downtime and poor fuel economy. Lubricity-improving additives are the most cost-effective way of achieving the lubricity specification for ULSD. **Diesel FX** is engineered to

improve the lubricity of low sulphur fuels and restore protection for the rotary fuel pumps. High fuel lubricity also prevents pump-sticking in the In-Line fuel pumps used in heavy-duty vehicles and equipment.



Product Application:

Diesel FX Advanced Diesel Fuel Treatment may be continuously or batch blended into diesel fuel, ULSD fuel or Biodiesel blend as a concentrate or as a stock solution.

Typical Properties of Diesel FX		
Property	Method	Result
Appearance		Clear, light amber liquid
Viscosity, cSt @ 100°F (37.8°C)	ASTM D445	5
@ 68°F (20°C)		8
@ 32°F (0°C)		16
@ 0°F (-17.8°C)		37
@ -20°F (-28.9°C)		72
@ -40°F (-40°C)	164	
Specific Gravity, 60/60°F (15.6/15.6°C)	ASTM D941	0.959
Density, lb/gal, 60°F (15.6°C)	ASTM D941	7.99
Flash Point, TCC °F (°C)	ASTM D92	163 (72.8)
Pour Point, °F (°C)	ASTM D97	< -40 (< -40)

Special Notations on Diesel FX	
Application:	Diesel FX Advanced Diesel Fuel Treatment may be continuously or batch blended into diesel fuel as a concentrate or as a stock solution.
Personal Safety, First Aid, Storage, and Handling	See the Material Safety Data Sheet. Do not heat. Self sustaining exothermic decomposition of cetane improver begins above 212°F (100°C). Risk of explosion if heated under confinement.
Recommended Treat Rate	1:1000, or 152 cc's : 40 gallons
Registered EPA Maximum Treat Rate	2000 mg/L

Diesel FX to Diesel Lubrication Blend Ratio	
Application Rate 1 oz of Diesel FX to 8 Gallons of Diesel Fuel (1:1000)	
Diesel FX	Fuel
1 Ounce (29.5 ml)	8 Gallons (30.28 Liters)
32 Ounces (1 Quart Bottle)	256 Gallons (969 Liters)
128 Ounces (1 Gallon Jug)	1,024 Gallons (3,876 Liters)
640 Ounces (5 Gallon Pail)	5,120 Gallons (19,381 Liters)
7,040 Ounces (55 Gallon Drum)	56,320 Gallons (213,194 Liters)

Diesel FX is available in the following convenient sizes:

- 1 Quart (32 ounce) Bottle
- 1 Gallon (128 ounce) Jug
- 5 Gallon (640 ounce) Pail
- 55 Gallon (7,040 ounce) Drum



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