



TECHNICAL DATA

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#137ULSW DIESEL TREAT 2000™ ULTRA LOW SULFUR WINTER PREMIUM

Application

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium is a multifunctional, ultra low sulfur compliant diesel fuel additive that is specifically formulated to provide maximum cold temperature protection against fuel gelling, waxing, and fuel line freeze-up, in addition to providing improved fuel efficiency, increased power, increased fuel lubricity, improved injector cleanliness and improved fuel stability. Diesel Treat 2000™ Ultra Low Sulfur Winter Premium provides clean-up and keep clean performance, as shown by the Peugeot DW-10 Injector Depositing Test, throughout the entire fuel system.

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium can be used in all types of diesel fuel including low sulfur diesel fuel and biodiesel blends.

Features and Benefits

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium contains a highly concentrated multi-functional additive package, which allows the product to provide the following performance benefits when used at the recommended treatment ratio.

1. Improvement of the fuel's cetane number up 2 to 4 points.
2. Easier cold weather starting and reduced misfiring at lower air inlet temperatures.
3. Faster warm-up.
4. Clean-up & Keep clean performance proven in the Peugeot DW-10 Injector Depositing Test
5. Cummins L-10 Injector Depositing Test and Cummins N-14 Injector Corrosion Test Performance.
6. Dispersion of insoluble gums and varnish present in low quality fuels.
7. Excellent deposit control for light duty and medium duty in direct injected diesel engines.
8. Improved combustion of the fuel by completely vaporizing the fuel into smaller particles, thus providing better fuel economy and preventing a significant loss in engine power.
9. Improved fuel economy up to 3%.
10. Modification of existing injector deposits, allowing for their removal and safe passage into the combustion chamber where they can be burned.
11. Reduced emissions, exhaust smoke, particulates and black smoke.
12. Excellent anti-wear protection for injectors and fuel pumps.
13. Supplemental ring and valve-train anti-wear protection.
14. Lubrication of the upper cylinders, fuel pumps and injectors.
15. Increased fuel thermal stability to resist thermal degradation.
16. Inhibition of oxidation during storage which extends storage stability
17. Rust and corrosion protection to the entire fuel system

Coupled with this multifunctional additive package is a non-alcohol jet fuel deicer/water dispersant which eliminates the problems associated with entrained and/or dissolved water present in the fuel by dispersing the water into tiny droplets. These tiny droplets are suspended in the fuel so they can be carried with the fuel in controlled amounts through the fuel filters, fuel lines, and into the combustion chamber to be burned with the fuel. Because the remaining water is dispersed and suspended in the fuel, Diesel Treat 2000™ Ultra Low Sulfur Winter Premium prevents the formation of stable fuel-water emulsions.

Improved Low Temperature Operability

Changes in the refining process of middle distillates to make ultra low sulfur diesel fuel have resulted in chemical changes that can significantly impact the fuel's low temperature operability. These chemical changes cause an increase in the amount of total wax (n-paraffins) and wax-to-wax ratios present in the fuel. These wax particles become more concentrated and harder to disperse. As the temperature of the ultra low sulfur diesel fuel drops, the concentrated wax molecules can begin to rapidly precipitate out of the fuel and form large flat or irregular crystals that can quickly plug fuel lines and filters.

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium contains a proprietary wax crystal modifier, cold flow improver; heavy wax modifier polymeric type additive system that when added to the diesel fuel before the fuel has reached its cloud point helps to prevent the formation of wax crystals. This proprietary polymeric additive system modifies the individual wax crystals by encapsulating and dispersing them as they are formed. This not only drastically reduces the size of the wax crystals by preventing the growth of larger wax crystals through adhesion to each other; but, also allows the wax crystals to flow through the fuel filters and lines and into the combustion chamber with the fuel.

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium can significantly improve the gelling point and low temperature operability of the fuel. **Improvement in low temperature operability is dependent upon the refining process used to make the ultra low sulfur diesel fuel and its response to the additive.**

Prevention of Settling of Wax Crystals at Low Temperatures

The wax crystals forming in a fuel normally have a slightly higher density than the liquid fuel portion resulting in these wax crystals settling at the bottom of the vehicle fuel tanks and the fuel storage tanks.

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium contains a proprietary wax anti-settling agent (WASA) that is designed to prevent the paraffins and other waxy components, which can plug and clog filters and other fuel system components, from dropping out of the fuel and settling out over extended periods of time. This increases the diesel fuel's cold weather operability which reduces downtime and maintenance costs.

Increased Lubricity Protection with Synshield™

Today's diesel powered vehicles feature low emission engines that are more susceptible than ever to diesel fuel related wear. Diesel engine designs are employing the use of higher fuel injection pressures, hotter fuel return temperatures, higher operating temperatures and complex engine geometry to control emissions. All of these factors result in increased fuel system wear and can shorten engine life.

The mandate of the United States EPA to reduce the sulfur content of diesel fuels to control emissions has resulted in the elimination of certain naturally occurring, polar compounds that protect the fuel system from wear by forming a protective layer on the metal surfaces of the fuel injection system. The increased use of the hydrotreating and hydrocracking refining processes to produce the maximum 15 ppm ultra low sulfur diesel fuel causes these naturally occurring polar compounds to become either chemically altered or completely removed which leads to increased engine and fuel system wear.

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium is blended with Schaeffer's proprietary lubricity additive, Synshield™ to protect today's diesel engines from fuel system related wear. Synshield™ surpasses industry standards for diesel fuel lubricity; and is the only lubricity additive that does not contain sulfur or sulfur containing compounds to exceed the EPA's new standard. Synshield™ prevents fuel system wear and injector scoring by forming a protective layer on the metal surfaces of the fuel

system and injectors and provide boundary lubrication between metallic parts in critical fuel system components. This protective boundary lubrication film not only reduces friction and wear between the fuel system surfaces that are in relative motion but also increases fuel system component life, thus leading to less downtime and longer equipment life.

Bulk Treatment Ratio

One gallon of Diesel Treat 2000™ Ultra Low Sulfur Winter Premium to 1,000 gallons of diesel fuel.

For hard to treat or unresponsive Ultra Low Sulfur Diesel Fuels use one gallon of Diesel Treat 2000™ Ultra Low Sulfur Winter Premium to 750 gallons of diesel fuel.

Storage Requirements

It is recommended that this product be stored 15 degrees above its pour point.

Diesel Treat 2000™ Ultra Low Sulfur Winter Premium is registered for use and meets the US EPA requirements for blending into low sulfur and ultra low sulfur diesel fuels. When used at the recommended treatment ratio, Diesel Treat 2000™ Ultra Low Sulfur Premium Winter will not have any measurable effect on the cetane index or aromatic and sulfur content of the diesel fuel.

THIS DIESEL FUEL ADDITIVE CONTAINS LESS THAN 15PPM OF SULFUR AND COMPLIES WITH THE FEDERAL LOW SULFUR CONTENT REQUIREMENTS FOR USE IN DIESEL MOTOR VEHICLES AND NON-ROAD ENGINES.

THIS DIESEL FUEL ADDITIVE IS COMPATIBLE AND APPROVED FOR USE WITH DIESEL FUELS THAT MEET ASTM D975 AND BIODIESEL THAT MEETS ASTM D6751 AND BIODIESEL THAT MEETS EN 14214.

TYPICAL PROPERTIES

Specific Gravity	0.884
Flash Point °F/°C PMCC (ASTM D-93)	126°/52°
Pour Point °F/°C (ASTM D-97)	-30°/-34.4°
Ash Content %wt. (ASTM D-482)	0
Copper Strip Corrosion Test (ASTM D-130)	1a
Sulfur Content ASTM D-7039	<15 ppm