



orion[®]5000

Frequently Asked Questions

Why does my organization need Orion 5000-EL?

To better control costs

- To hedge against rising diesel fuel prices
- To extend maintenance intervals
- To manage your annual fuel budget
- To protect profit margins

Orion 5000-EL--a synthetic engine and fuel lubricant--was developed for the operators of medium and heavy-duty diesel engines to improve fuel efficiency, reduce maintenance costs and lower annual fuel expenses. Real world results with businesses like yours prove that Orion 5000-EL typically increases fuel efficiency 6% to 9% in both over-the-road and off-road work environments.

Just a 6% fuel improvement can save a fleet of 50 trucks \$150,000 annually at \$3.00 per gallon. At \$3.50 per gallon, that number jumps to \$175,000. The higher the fuel price the greater your savings. The larger your fleet size the larger the savings.

You'll save money with reduced maintenance costs and extended maintenance intervals. The continuous use of Orion 5000-EL in the fuel system and crankcase lowers maintenance costs by extending engine oil change cycles and the life of the diesel particulate filters (DPF), fuel injectors, fuel pumps, and minimizes residue buildup on exhaust gas recirculation (EGR) valves.

Why does my diesel engine need Orion[®] 5000-EL?

Your diesel engine needs Orion 5000-EL for three very important reasons:

- To counter act the effects of ultra low sulfur diesel fuel (ULSD)
- To aid and assist the high tech improvements in today's engines and new fuel injector systems
- To meet clean air requirements

(1) To counter act the effects of ultra low sulfur diesel fuel (ULSD)

Today's low sulfur diesel fuels are better for the environment but harder on diesel engines.

Because of the reduced sulfur content in ULSD, there are lower levels of lubricity resulting in reduced fuel economy, excessive engine and component wear, and increased maintenance intervals. Less lubricity leads to more metal on metal wear so there's not only more engine scarring, the pace of the metal wear is also accelerated.

Orion 5000-EL provides the extra lubricity that today's high performance diesel engines need to continuously lubricate the faster moving metal parts, reducing metal on metal wear, maximizing engine power and improving fuel efficiency.



(2) To aid and assist the high tech improvements in today's engines and new fuel injector systems

Today's high performance engines use high pressure fuel injector systems with common rails and smaller nozzle holes. These smaller holes have a tendency to get gummed up from carbon deposits (nozzle coking) more often these days due to their small size and the lack of adequate detergency. Gummed up fuel injectors lead to decreased power and lowered performance.

Orion 5000-EL provides the extra detergency that today's high performance diesel engines need to continuously clean their fuel injectors, maximize engine power and improve fuel economy.

(3) To meet clean air requirements

As good as ULSD fuel is for the environment, and as good as your diesel particulate filter (DPF) is, your diesel engine is still kicking out ash, particulate matter (PM), hydrocarbons (HC), nitrogen oxides (NOx), and carbon monoxide caused by diesel fuel combustion.

Orion 5000-EL reduces emissions. When added to the fuel tank, Orion 5000-EL enables the fuel to burn cleaner providing more energy, power and performance, and improving fuel efficiency.

How does Orion 5000-EL work?

Orion 5000-EL is formulated with ASET™ technology to provide increased lubricity and detergency to overcome the problems associated with ultra low sulfur diesel fuel (ULSD). Orion 5000-EL's natural molecular polarity results in lower volatility, cleaner lubrication, longer life, biodegradability and attraction to metal surfaces.

When added to the fuel tank, the high weight synthetic ester molecules in Orion 5000-EL quickly coat and penetrate the surface of the diesel engine and its moving parts. Orion 5000-EL forms a bond with the metal and adds needed lubricity to reduce metal on metal friction, heat and wear.

The low weight synthetic ester molecules in Orion 5000-EL add solubility, dispersal and detergency throughout the fuel system and crankcase to clean the fuel system and fuel injectors by removing harmful by-products like carbon, sludge, coking, and varnish.

The added lubricity and detergency in Orion 5000-EL enables the engine to perform more efficiently by reducing particulate matter being sent to the DPF and burning the diesel fuel more completely reducing the sulfur ash, carbon deposits, and dissolving foreign particles.

Can Orion 5000-EL harm my engine in any way?

The use of Orion 5000-EL will not harm your engine. Orion 5000-EL uses only the purest raw materials. Orion 5000-EL is formulated with the highest quality group II base oil and synthetic ester components. In fact, the synthetic components in Orion 5000-EL are higher in quality and quantity than those found in premium synthetic engine lubricants including name brand high performance motor oils.

Is Orion 5000-EL free of toxic and harmful chemicals?

Yes. Orion 5000-EL is free of all toxic and hazardous chemicals that are typically found in other common fuel additives, such as trimethylbenzene, naphthalene, ether and other hazardous ingredients.



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What is the flash point of Orion 5000-EL?

Orion 5000-EL is safe to use and store. Its flash point is 307° Fahrenheit. Typical flash points for common chemical fuel additives range from 105° to 130° Fahrenheit. Diesel fuel flash points typically range from 126° to 200° Fahrenheit.

Does Orion 5000-EL improve cold weather starting?

Yes. The cetane boost from using Orion 5000-EL and the increased lubricity from its molecular formulation improve cold weather starting.

Independent testing performed by Paragon Laboratories using ASTM D613 protocol proves that Orion 5000-EL increases cetane levels of diesel fuel by two points or 4.5%. Increased cetane levels provide shorter ignition delay, better quality of combustion, and improved cold weather starting.

The ester molecules in Orion 5000-EL not only boost the cetane, they increase lubricity. These molecular properties are very important to diesel engines, fuel and crankcases especially during cold weather. The ester molecules in Orion 5000-EL are attracted to positively charged metal surfaces and form a strong film which creates higher lubricity. That makes it easier for fuel and oil to flow in cold weather.

A significant amount of engine wear occurs when the motor is very cold so you want maximum protection as soon as possible. Orion 5000-EL bonds with the metal surfaces in your engine and crankcase allowing your fuel and oil to pump quickly when it's cold reducing wear, and protecting your engine and its components.

Is Orion 5000-EL registered with the EPA?

Yes. Orion 5000-EL's U.S. Environmental Protection Agency number is 243520001. This diesel fuel additive complies with federal low sulfur content requirements for use in diesel motor vehicles and non-road engines.

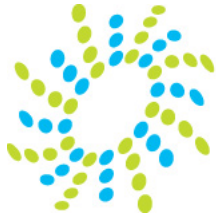
Can I safely use Orion 5000-EL and not impact my manufacturer's warranty?

Orion 5000-EL will not void your engine's warranty. The Magnusson-Moss Warranty Act protects you and states that "use of after-market products will not void a manufacturer's warranty." As an added protection, Orion 5000-EL is fully insured with full product liability coverage.

Is Orion 5000-EL cost effective to use?

Yes. Orion 5000-EL clients typically see fuel savings of 6%-9% after the cost of the product with continuous use. The higher diesel fuel prices go the more you will save. The more trucks in your fleet or yellow iron in service the more you will save. The breakeven point in fuel efficiency alone is typically 2%-3%. After that you are saving money.

You'll save money with reduced maintenance, too. The continuous use of Orion 5000-EL in the fuel system and crankcase lowers maintenance costs by extending engine oil change cycles and the life of the diesel particulate filters (DPF), fuel injectors, fuel pumps, and minimizes residue buildup on exhaust gas recirculation (EGR) valves.



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Will Orion 5000-EL reduce emissions?

Yes. Orion 5000-EL reduces emissions due to its unique formulation.

(1) The natural polarity of the esters increases detergency through solubility and dispersal. The esters disperse the carbon, varnish and sludge from the walls of the fuel line and the fuel injectors back into the fuel where they flow into and are trapped by the diesel particulate filter (DPF) or are burned completely during the combustion process.

Orion 5000-EL clients have demonstrated 30% reductions in particulate matter (PM) emissions, with results often higher, using Red Mountain Engineering Smoke Check 1667 opacity meters (SAE J1667 standard specifications).

(2) The increased cetane content in Orion 5000-EL reduces dangerous NOx emissions especially in non-road fleets where less cetane-insensitive technologies exist. In an ASTM D613 test—Cetane Number of Diesel Fuel—Orion 5000-EL increased the cetane level of diesel fuel 4.5%.

(3) Orion 5000-EL burns nearly ashless. In an ASTM D482 test— Ash Content from Petroleum Products— Orion 5000-EL was found to burn 99.9999% ashless upon combustion.

Will Orion 5000-EL improve my diesel fuel's performance?

Yes. Orion 5000-EL will increase your diesel fuel's performance. Increased fuel lubricity leads to an increase in engine performance and an increase in fuel efficiency. It also increases the longevity of fuel injectors and fuel pumps. Orion Industrial recently conducted a lab test and continuously monitors its clients' results.

In the Lab

Orion Industrial, LLC contracted with Paragon Laboratories, Inc. to perform an ASTM D6079 — Lubricity of Diesel Fuels by High-Frequency Reciprocating Rig (HFRR). The results of the lab test indicate an 8.6% increase in lubricity in ULSD fuels treated with Orion 5000-EL. The independent test suggests that continuous use of Orion 5000-EL will improve the performance of your medium-duty to heavy-duty diesel engine.

In the Real World

Orion 5000-EL has been successfully implemented in both over-the-road and off-road work environments on medium duty and heavy-duty diesel engines. Our clients typically experience a 6% to 9% increase in fuel efficiency during their day-to-day operations.

[Results from various diesel intensive industries:](#)

International Aggregate Operator — 7.12% Fuel Efficiency Improvement

Waste Hauler — 13.9% Fuel Efficiency Improvement

Fleet — 9.7% Fuel Efficiency Improvement

Agriculture — 20% Fuel Efficiency Improvement



Will Orion 5000-EL improve my motor oil's performance?

Orion Industrial, LLC contracted Petro-Lubricant Testing Laboratories, Inc. to conduct the ASTM D4172 Four Ball Wear Test on some common motor oils with and without Orion 5000-EL. The four-ball test method determines fluid wear protection. Anti-wear fluids will reduce the amount of metal lost due to friction during metal on metal contact.

Motor oil samples treated with Orion 5000-EL experienced an improvement in the Wear Scar Diameter as well as a reduction in the Coefficient of Friction compared to its baseline reading.

Adding Orion 5000-EL to either conventional or synthetic motor oil improves engine wear by reducing scaring and friction levels between metal surfaces. The ASTM D4172 Four Ball Wear Test and Coefficient of Friction lab results confirm the real world results of Orion customers. Orion 5000-EL's molecular properties increase lubricity, thereby improving the motor oil's performance.

How do I use Orion 5000-EL?

Orion 5000-EL works best when properly administered with continuous use.

For the Fuel Tank

Initial Fuel Tank Treatment

Add 5oz. (147ml) of Orion 5000-EL per 10 gallons of fuel (37.85L) to speed engine conditioning.

2nd Fuel Tank Treatment

Repeat initial treatment for second application.

Ongoing Fuel Tank Treatment

Fuel tank: Add 1oz. (29ml) of Orion 5000-EL per 10 gallons (37.85L) of fuel

For the Crankcase

Initial Crankcase Treatment

Add 1oz. (29ml) of Orion 5000-EL per quart of oil to crankcase

Ongoing Crankcase Treatment

Crankcase: Add 1oz. (29ml) of Orion 5000-EL per quart of oil to the crankcase with oil changes

This diesel fuel additive complies with federal low sulfur content requirements for use in diesel motor vehicles and non-road engines.