Mobil Diesel Efficient™

Frequently Asked Questions

General

What is Mobil Diesel Efficient (MDE) fuel?

- MDE, delivered by ExxonMobil authorized resellers, is the first and only fully formulated, additized diesel fuel with a proven fuel economy claim in the United States.
- It is specially engineered to help improve fuel economy and boost engine performance by cleaning up injector deposits. This new fuel also helps improve power, increase engine responsiveness and reduce emissions. MDE fuel can also help guard against internal injector sticking which can contribute to premature injector failure. Furthermore, MDE fuel offers excellent fuel system corrosion protection and can help prevent premature fuel filter plugging.

I already use an additive and manage the inventory and dosing procedures in-house. What would be the benefit of using MDE fuel instead?

- MDE fuel is a fully-formulated fuel, meaning the additive is injected and blended into ASTM D975 base fuel with precision at the fuel terminal.
  - Correct additive concentration and adequate blending are essential to harnessing the benefits of fuel detergents.
  - Hand-dosing additive requires administrative and operational costs to research, purchase, store and dose additive.
  - Under-dosing could result in lost performance, over-dosing could result in adverse impacts to your equipment.
- MDE fuel delivers guaranteed quality and proven performance without requiring any extra effort on the part of the customer.

Why would I need to use an advanced diesel fuel such as MDE fuel today?

- Modern diesel engines have very sophisticated fuel systems engineered to meet today's stringent diesel engine emissions requirements. MDE fuel helps prevent deposit formation and cleans up the existing deposits that may be negatively affecting your engine performance. Deposits on the injector needle guide or control valve, which have extremely tight tolerances (~ 2 - 5 microns), can jam the needle movement and cause early failure of the injectors. Deposits which build up inside and around the injector nozzle can restrict fuel flow and deteriorate the fuel spray quality which results in loss of engine power, increased emissions and reduced fuel economy.

What additive types are contained in MDE?

- MDE fuel's patented additive technology is a multifunctional detergent system that cleans up and prevents the formation of both internal and external injector deposits. Cleaner injectors lead to improved performance. The size of the benefit is dependent on the type and amount of accumulated deposits, type of fuel system in use, duty cycle, and other factors.
- It also contains a demulsifying agent to shed water.
- In northern regions of the US during cold weather months, the MDE fuel additive system also contains a compatible cold weather additive to enhance low temperature operation.

(Note: MDE fuel is added to ASTM D975 base fuel, which may contain other components in order to meet the required specification targets (i.e. cetane improver, lubricity improver).)

How is MDE fuel different from standard diesel fuels?

- MDE fuel is treated with a patented additive package that is specially designed to clean up and keep clean both internal injector deposits and nozzle deposits. Research demonstrates that MDE fuel can help improve the performance of your diesel engine.

Performance

Once I start using MDE fuel in my equipment, how long will it take to see results?

- MDE fuel will start working right away to clean up fuel system deposits and noticeable benefits resulting from the cleanup process will vary depending on multiple factors such as equipment duty cycle and the starting condition of the fuel system.
- The level of improved engine performance depends directly on the level of performance degradation that has taken place as a result of fuel system deposit accumulation.
- Customers have reported experiencing an improvement in performance after three to four tank fills of MDE fuel.

I travel all over and MDE fuel is only available at a few of your locations. What happens if I use fuel other than MDE fuel?

- Consistent use of MDE fuel will have the greatest benefit on fuel economy and fuel system health. That said, using MDE fuel whenever possible is better than not at all as it will help clean up engine deposits with every tank fill.

Will MDE fuel accelerate the ash loading of the diesel particulate filter?

- MDE fuel contains ashless detergent technology and therefore should not contribute to the ash loading of the diesel particulate filter (DPF). MDE fuel can clean up injector deposits to promote better spray quality and improve fuel/air mixing resulting in reduced emissions, which can mitigate soot loading of the DPF.

Will I still benefit from MDE fuel even if I have a new, clean fuel system?

- Yes, one of the best ways to help guard against engine deposit formation in a new, clean fuel system is to use MDE fuel. The "keep clean" technology manages deposit precursors and helps prevent them from attaching to either internal or external injector surfaces.
- Keeping your fuel system clean will help maintain "like new" performance.

When I convert to MDE fuel, will I need to change my fuel filters more frequently?

- The first two to three tank fills may result in a more frequent fuel filter replacement interval. This is due to MDE fuel "cleaning up" the fuel system. After the initial "clean-up" process, the service intervals will return to historical levels.
- MDE fuel can protect filters from premature plugging by saturated monoglycerides, which are introduced with biodiesel and are the lead cause of premature filter blocking.
- MDE fuel can also improve fuel thermal stability and help prevent premature filter plugging caused by thermally stressed fuel.

Will MDE fuel help remove the water out of my storage tank?

- The MDE fuel additive includes a demulsifier designed to shed water from the fuel rather than holding onto it.
- Additives that hold (emulsify) fuel and water run the risk of transferring higher water content fuel to other storage tanks or worse, customer equipment/engine fuel systems.
- Today's modern engine fuel systems have a low tolerance for water, and high water levels can promote corrosion as well as damage fuel pumps and injectors.
- In cold climates, water in fuel systems can freeze, resulting in fuel filter plugging, which starves the engine of fuel.

I suspect I am experiencing issues with microbial growth in my storage tanks and/or equipment fuel tanks. Can MDE fuel help control my microbiological growth problem?

- MDE fuel does not contain a biocide component to control microbiological activity.
- The best approach to control biological growth is to limit water contamination in fuel storage systems, as even the smallest amount of water present in a fuel storage tank can provide a habitat for microbe growth. This includes dormant microbe spores that would likely go unnoticed/undetected by simple test methods.
- Biocides are effective to use on a case-by-case basis to treat an existing overgrowth of microbes.

(Note: Biocides are expensive components meant to exterminate living organisms, and are not intended to be used continuously.)

Applications

Does the Mobil Diesel Efficient meet ASTM D975 specifications?

- Yes, MDE fuel is an ASTM D975 compliant fuel.
- MDE fuel technology is blended into ASTM D975 base fuel at designated fuel terminals and does not affect ASTM D975 compliance.

What types of applications and engines would benefit from using MDE fuel?

- MDE fuel is designed to provide benefits in all types of applications requiring an ASTM D975 fuel including but not necessarily limited to light duty passenger cars and trucks, on-highway commercial trucks and off-road construction and mining equipment.

Will it harm my equipment?

- No, a rigorous test program was performed on MDE fuel to ensure that no adverse effects will result from its use in vehicles specifying the use of D975 diesel fuel.

Is MDE fuel compatible with biodiesel blends?

- Yes, the performance testing was successfully performed using a B5 base fuel.*
- MDE fuel is available in biodiesel blends up to B5 where B5 is available, and up to a B11 in Illinois.*

**Note: Drivers must consult their OEM service manuals to determine the biodiesel content approved for use in their specific vehicle.*

Product Testing

What kind of independent testing was done to support your claims?

- Extensive product testing was performed in world-class independent testing facilities. The test protocols used were scientifically designed to tightly control important factors such as vehicle load, driving styles, ambient conditions, and test equipment. This robust testing approach helps ensure that the observed differences and performance benefits are from MDE fuel and not from other factors.

What type of fuel was used for the testing?

- The performance testing was performed using a B5 base fuel.

How does MDE fuel compare to "off-the-shelf additive in a bottle"?

- MDE fuel carries the benefit of being homogenized at the terminal, requiring no additional mixing upon receipt and guaranteeing accurate additive concentration to yield desired engine performance.

What type of equipment has been used to test MDE fuel? Have you tested in off-road equipment?

- The quantifiable fuel economy and emissions claims were generated using on highway commercial trucks, pickup trucks and light duty passenger cars.
- MDE fuel has been in use for several years in off-road equipment. For example, The Imperial Kearl Oil Sands in Alberta, CAN is currently operating on Synergy Diesel Efficient fuel.
- Field tests conducted using off-road and stationary equipment have demonstrated the following performance results:*
  - 1% fuel economy improvement in stationary generators.
  - Injector flow restoration in CAT 797F ore haulers.
  - 1.5-2% fuel economy improvement in Cat 3512 fracking pumps

Have you done any competitive testing vs. aftermarket diesel fuel additives?

- The MDE fuel testing program was focused on validating fuel economy and emissions benefits vs. non-detergent diesel fuel.
- There are a wide array of aftermarket additives in the market place, making it not cost effective to conduct rigorous comparative test programs.
- Issues with properly blending aftermarket additives (i.e. homogeneity and accurate concentration) make them hard to evaluate and make it difficult to accurately simulate their field performance. Under-dosing could result in lost performance, over-dosing could result in adverse impacts to your equipment.

**Applies to Mobil Diesel Efficient fuel compared to diesel fuel without detergent additive. Actual benefits will vary depending on factors such as vehicle/engine type, driving style and diesel fuel previously used. Concentration and availability of our proprietary additive package may vary based on upon factors beyond our control.*

Cold Weather Operability

Why is winterized MDE fuel needed?

- All diesel fuel contains paraffin wax. At low temperatures the wax separates (precipitates) from the fuel as wax crystals, which eventually collect and lead to fuel gelling. Fuel gelling results in reduced pumpability and may lead to premature fuel filter plugging.
- Winterized MDE fuel contains a cold flow improver, which helps to lower the fuel's natural pour point by modifying the shape, size and formation of wax crystals to help fuel flow through fuel filters at lower temperatures.

What is the coldest temperature in which winterized MDE fuel can be used?

- Typically, winterized MDE fuel can improve the low temperature operability of base fuels by as much as 15°-20°F below the fuel's cloud point.*
- Cold weather operability of diesel fuel is highly dependent on the base diesel fuel's properties, such as its composition and cloud point.
- The cloud point (CP) is the temperature at which wax crystals begin to form in the fuel and is used as an estimator of the cold weather operability of the fuel.
- Cold flow improvers do not lower the CP, but instead lower the temperature at which wax will block the fuel filters (Cold Filter Plugging Point or CFPP).
- The CFPP is typically lower than the cloud point but higher than the pour point of diesel fuel.

**Low temperature properties and response to cold flow improvers vary by fuel.*

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