Today's diesel engines demand better fuel

Not all delivered diesel fuels are the same.

Today's diesel engines have very sophisticated fuel systems engineered to meet today's more stringent diesel emissions requirements.

Modern fuel systems operate with higher injection pressures and temperatures, extremely tight internal fit tolerances, and execute multiple fuel injection events per cycle. Combined with further desulfurization of the fuel, these changes have placed more stress on the fuel and fuel system.

Selecting a better diesel fuel.

Work with your bulk fuel supplier to carefully select the diesel fuel scientifically proven to consistently deliver optimal equipment efficiency so you can maximize your bottom line.

Product Properties

Look For

Balanced formulation that meets or exceeds the specs.

Avoid

Paying for products you don't need.

All diesel fuels and additives are characterized by certain properties and quality features that define the physical make-up of the product and help determine its operational capabilities. Each country has a specification, i.e. ASTM D975, that diesel fuel is required to meet to ensure that it meets quality standards and engine Original Equipment Manufacturers (OEM) performance characteristics to protect the engines, after-treatment and fuel systems. Depending on your particular operational or applications needs, some properties may be more important than others.

Claim Substantiation

Look For

Claims that have been validated with statistically significant accuracy by independent labs.

Avoid

Claims that are only underpinned by customer specific anecdotes that have not been scientifically verified.

A product's claims are only as good as the validation methods used for those claims. Clues as to how fuel marketers establish their claims can usually be found in the fine print of any legal footnotes. The burden of proof for a particular claim will vary from marketer to marketer depending on each company's level of risk tolerance. Marketers that are more risk averse may not accept anecdotal evidence, while another marketer may find that anecdotal validation is sufficient to support an entire suite of claims. It is important to understand and weigh a marketer's reputation with how they represent their products.

Additization Method

Look For

Additives that have been applied at the terminal rack at precise concentrations and appropriate temperatures to ensure a homogenous mixture that can consistently deliver performance benefits.

Avoid

Additive that has been hand dosed or splash blended by personnel unfamiliar with concentration requirements. Inability to control temperatures and/or ensure a homogenous mixture.

Determine how the additives are introduced into the diesel fuel. Fuel suppliers may hand dose, splash blend or use terminal additization systems to apply the additive. Hand dosing or splash blending comes with operational complexity and potentially inconsistent performance benefits. Terminal additization systems, while very expensive, deliver consistent quality and performance benefits.

Quality Control

Look For

Additive package applied to the diesel fuel that has undergone thorough quality control testing to ensure it is stable, compatible, and won't cause unintended side effects to your fuel systems and equipment.

Avoid

Quality control testing not documented or not performed, leading to unknown consequences to your fuel system and equipment.

Since fuel formulation is not a trivial exercise, processes must be in place to ensure that the product is delivered at a consistent quality. While this information is not easily obtained via a product data sheet, it is an important aspect to understand nonetheless. If a product is being seriously considered for use, a meeting with a company representative is likely warranted to understand quality assurance methods in place.

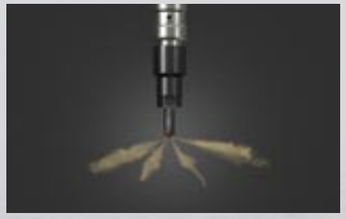
Additives – Which do you really need?

Detergents

Help keep your fuel injectors clean

Detergents help to remove existing internal and external injector deposits and prevent new deposit formation that adversely impact engine performance. By restoring injector function, your engine is able to operate more efficiently, burn less fuel, produce less emissions, protect the critical fuel system components, and reduce unplanned maintenance.

While detergents provide the best return on investment, they do have a downside in that they can reduce the fuel's ability to shed water. For that reason, they should be coupled with a demulsifier.



Dirty fuel injector

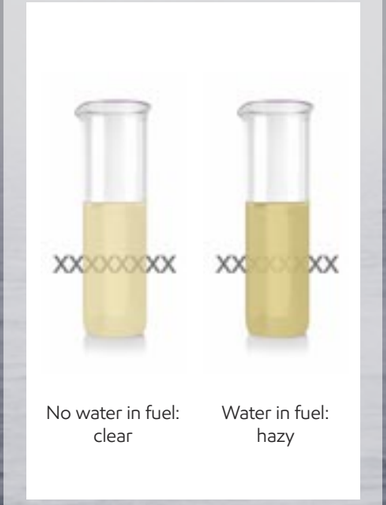
Clean fuel injector

*Illustration purpose only.

Demulsifiers

Help manage water contamination

Demulsifiers help to separate water from diesel fuel in order to prevent carrying the water along with the fuel. Water contamination can cause many issues, including rust, corrosion, microbiological growth, filter plugging, and freezing.



No water in fuel: clear

Water in fuel: hazy

*Illustration purpose only.

Cetane Improver

Limited benefit in today's engines

Higher cetane can help improve cold starts in cold weather by shortening the ignition delay, promoting complete combustion, and reducing misfiring. Beyond the benefits experienced during the few minutes of warm-up, higher cetane fuel has limited benefits.

- U.S. diesel engines are calibrated and optimized using typical U.S. fuel, which can be as low as 40 cetane.
- Negligible performance / efficiency impact of higher cetane fuel after warm-up, since the effect of cetane on ignition delay becomes much smaller.
- Advancements in diesel engine technology (high injection pressures, multiple injections per cycle, etc.) have made today's diesel engines less sensitive to cetane.

Lubricity Improver

Over treating can cause issues

Lubricity helps protect against accelerated wear of metal-to-metal surfaces. However, there are several downsides to using additional lubricity improvers:

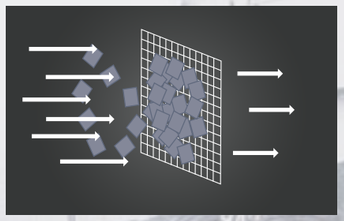
- Vehicles in the U.S. are designed to run on lubricity requirements in ASTM D975 (WSD <520µm)
- Many diesel fuels already contain lubricity improvers. Using additional lubricity improver could result in an overtreatment and cause premature fuel filter plugging or deposits.
- Many diesel fuels contain at least some low level of biodiesel, as ASTM D975 allows for up to 5% blends. As little as 2% biodiesel can result in an HFRR Wear Scar Diameter < 460 µm, which corresponds to the most stringent requirements.

Therefore, the need for additional lubricity in North America is questionable.

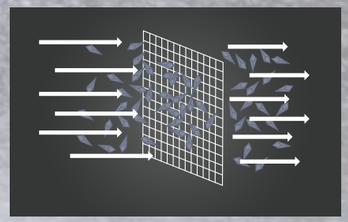
Cold Flow Improvers (CFIs)

Help prevent fuel gelling issues

Cold flow improvers help to improve the operability of diesel fuel at cold temperatures by modifying how wax crystals form and preventing them from agglomerating together. However, CFIs need to be added at the correct temperatures at precise concentrations to prevent fuel gelling. If applied correctly, the fuel will continue to flow through the filter until the fuel system warms up enough to prevent gelling of the diesel fuel.



Without CFI



With CFI

*Illustration purpose only.

Mobil Diesel Efficient™ fuel advantage*

First and only fully formulated diesel fuel from a major energy company

What's in it?

Mobil Diesel Efficient fuel contains a proprietary and patented additive package balanced to provide the most impact to help save money, improve performance and operability, and reduce maintenance. It contains a multifunctional detergent system that helps to clean up and prevent the formation of both internal and external injector deposits. It also contains a demulsifying agent to shed water. This additive package is added to ASTM D975 specification diesel fuel.

How is it additized?

Mobil Diesel Efficient fuel is fully-formulated at the terminal meaning the additive package is uniformly and completely blended at the terminal rack at precise concentrations and appropriate temperatures to consistently deliver performance benefits. In northern states during specified months, winterized Mobil Diesel Efficient provides an additional 15-20°F of operability below the cloud point. No need to worry about selecting, inventorying, storing, or dosing additives yourself.

Independently tested quantified on-road fuel economy claim

How do I know it works?

Mobil Diesel Efficient fuel was tested in world-class, independent testing facilities in order to scientifically prove its benefits. This robust testing approach helps ensure that the observed differences and performance benefits are from Mobil Diesel Efficient fuel and not from other factors.

How is quality ensured?

ExxonMobil conducts extensive no-harms testing to ensure that the fuel is stable, the additives are compatible, and that there are no adverse impacts from using the fuel. Additionally, because it is additized at the terminal, you can rest assured that you are getting a quality fuel every time!

Additive	Base Diesel Fuel	**Mobil Diesel Efficient**	Benefit
Detergent		✓	●●●●●
Demulsifier		✓	●●
Cold Flow Improver*		✓	●●
Cetane	Added to base diesel fuel **only if required** to meet ASTM D975 specification		●
Lubricity	Added to base diesel fuel to meet ASTM D975 specification		●

Key: • = lower degree, ••••• = higher degree

*Winterized Mobil Diesel Efficient is available in northern geographies during the winter months.

Mobil Diesel Efficient™

Contact your Mobil Branded Reseller to learn more about Mobil Diesel Efficient™ fuel.

ExxonMobil Brands

mobildieselefficient.com