



## Diesel Fuel Overview

### What is diesel fuel?

Diesel fuel is a cut of crude oil that boils in a specific temperature range. It is ignited in the internal combustion engine cylinder by the heat of air ignited by compression and pressure. Because of this mode of ignition, a high cetane number is required in a good diesel fuel. The American Society for Testing Materials (ASTM), which is composed of representatives from the petroleum industry and other interested parties, established the D975 specification to define the minimum standard that is acceptable for distribution and use.

### Some specifications to know:

- ✓ Flash Point – The minimum temperature at which a fluid will provide a momentary flash flame. This limit was created for safety reasons during fuel handling and storage; it is not directly related to engine performance. The higher the flash point, the less likely the fuel will ignite when exposed to spark or flame.
- ✓ Water and Sediment – Regarding fuel cleanliness, there should be no foreign material in diesel fuel.
- ✓ Distillation Temperature – Gives an indication of the volatility and burning characteristics of the diesel fuel. Lighter, more volatile fuels may produce less exhaust smoke and odor. However, heavier fuels may provide better fuel economy due to higher BTU content.
- ✓ Kinematic Viscosity – Viscosity is of prime importance in diesel fuel since it can affect pump operation and injector spray patterns.

<b>Viscosity to Light:</b>	<b>Viscosity too Heavy:</b>
Leakage past pump plunger seals	Excessive load on pump parts and seals
Pump will not develop full pressure	Pump will develop excess pressure
Injector spray pattern affected	Injector spray pattern affected
Engine may be under fueled	Engine may be over fueled

- ✓ Ash – The ash content is a measure of non-combustible materials in the fuel. These materials could cause abrasive wear, filter plugging or deposits.
- ✓ Sulfur – Since 2014, EPA's diesel standards require that all non-road, locomotive, and marine (NRLM) diesel fuel must be ultra-low sulfur diesel (ULSD) containing no more than 15 ppm of sulfur. With some exceptions for older locomotive and marine engines, all NRLM engines must use ULSD. Higher sulfur content causes more emissions and greater accumulation of sulfuric acid in the crankcase due to sulfur in blow-by gasses.

- ✓ Copper Strip – Fuels are typically shipped in metal pipelines, stored in metal tanks, and burned in metal engines. It is important to not react negatively to metal surfaces.
- ✓ Cetane Number – In a diesel engine, the period of time between fuel injection and ignition is referred to as the ignition delay. Cetane number is a numerical expression that measures the ignition quality of diesel fuel based on the ignition delay in an engine.

A higher cetane number signifies a shorter delay period and a smaller amount of fuel in the combustion chamber when the fuel ignites. As a result, high cetane number fuels generally cause lower rates of pressure rise and lower peak pressures resulting in less combustion noise and improved control of combustion. This tends to enable easier starting, particularly in cold weather and faster warm-up.

- ✓ Cetane Index – An approximation of cetane number calculated using API gravity and distillation data. If cetane improver additives are added to diesel fuel, they can raise the cetane number, but will not change the cetane index because the index is calculated using base fuel properties.

Reformulated in 2012, DieseleX Gold entered the market with an enhanced formulation. It features a multi-functional package containing:

- 1) Cetane improver
- 2) Detergent
- 3) Corrosion Inhibitor
- 4) Lubricity Enhancer
- 5) Oxidation Inhibitor
- 6) Stabilizer
- 7) Demulsifier
- 8) Moisture Control

Each of these components has a specific function that directly contributes to engine performance and protection. Please review the [Product Catalog](#) or refer to your local FS for additional information.

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