



## Cetane Number – More is Better

### What is a cetane number?

Similar to the octane number seen on a retail gasoline dispenser, a cetane number rates a diesel fuel's quality of ignition. But that's where the similarities end.

The octane number of a gasoline measures its ability to resist auto-ignition commonly referred to as pre-ignition, knocking or pinging. A diesel fuel's cetane number, however, is actually a measure of the fuel's ignition delay; the time period between the start of the injection of the fuel and the start of the combustion of the fuel (commonly known as ignition). In general, a higher cetane fuel will have a shorter ignition delay period than a lower cetane fuel.

### What does a high cetane number mean to a diesel fuel user?

Since diesels rely on compression ignition, the fuel must be able to readily auto-ignite and quicker is better.

A higher cetane number, indicating a shorter ignition delay time, usually means more complete combustion of the fuel. This translates into:

- ✓ Quicker starting
- ✓ Quieter operation with less diesel chatter
- ✓ Improved fuel efficiency
- ✓ A reduction of harmful emissions
- ✓ Less wear and tear on the starter and batteries
- ✓ Quicker pumping of protective lubricating fluids throughout the system

### How can a higher cetane number be achieved?

There are two ways to gain a higher cetane number. The first is to do it during the refining process. Refining a high cetane diesel fuel usually results in a fuel with a higher API gravity rating and a lower density. A low density fuel contains fewer BTUs and consequently provides less power to a diesel engine. A typical gravity for #2 diesel fuel is in the 32-34 range compared to a high-cetane fuel which typically has a gravity rating in the 36-38 range and more closely resembles a #1 diesel fuel. When a higher cetane number is gained through the refining process, it usually means the fuel contains fewer BTUs, resulting in less horsepower and poorer fuel economy.

## **Another way to gain a higher cetane number...**

A higher cetane number can also be derived through the addition of cetane improver chemistry (2-ethyl hexyl nitrate). When cetane improver is added to a #2 diesel fuel, the result is a high-cetane-number fuel with more power and fuel efficiency than a similar fuel derived through the refining process. A side benefit is that #2 fuels usually cost less, too.

## **How are cetane numbers measured?**

Cetane numbers can only be measured by a laboratory engine test. Usual methods, such as using a cetane index (a calculation using API gravity and the distillation mid-point) cannot measure cetane numbers accurately when using cetane improvers.

## **How can FS help improve your diesel fuel usage?**

Users of FS Dieselext<sup>®</sup> Gold enjoy the benefits of high cetane with the optimum energy to power their diesel engines. FS Dieselext<sup>®</sup> Gold is a combination of a high-quality #2 diesel fuel and a proprietary multi-functional chemistry package. It includes a strong dose of cetane improver that allows it to carry a typical cetane number between 46 and 49 (#2 diesel fuels found in the Midwest typically carry a cetane number between 40 and 44). It's a fact that "more is better," but only when high cetane is combined with more power!