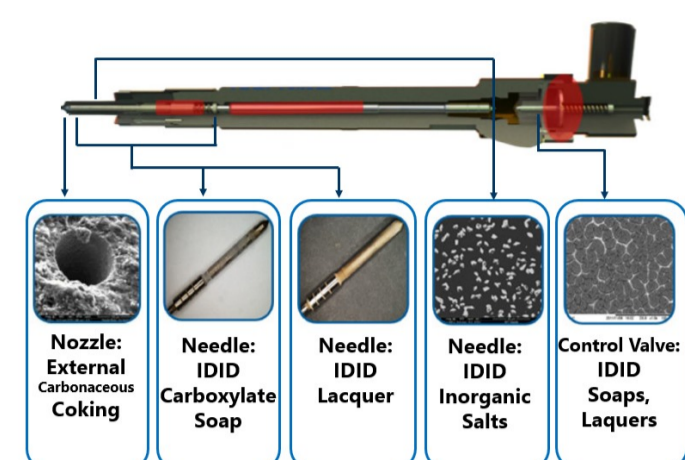


Premium Diesel Fuel Programs 2019



Premium Detergents

Not all detergents are created equal. Modern heavy-duty engines require detergents that are able to both keep injector tips free and clear of obstructions and prevent/ remove Internal Diesel Injector Deposits (IDID). The relevant tests that can prove these performance levels are the XUD-9, DW-10B and DW-10C, and Heavy Duty IDID Test.



Lubricity

Lubricity is important to protect and prolong fuel system life. Fuels that have a lower wear scar rating on the HFRR lubricity test create less wear and tear on fuel system components. Because of this, increasing lubricity levels in fuel is very beneficial to engine life and extending maintenance intervals.



Thermal Stability

Modern engines expose fuel to high pressures and extreme heat which can accelerate the breakdown of fuels. This results in the formation of larger black particles that can get caught in fuel filters. A good thermal stabilizer will extend filter and fuel life and prevent black filters.



Oxidative Stability

Oxidation occurs when fuel is stored for an extended period of time. Oxidative Stability components can keep fuel fresh for longer periods of time and prevent oxidative breakdown.

Cetane Improvers

Cetane Improvers allow engines to start easier, especially in cold weather and ignite fuel faster for more complete combustion. They also reduce white smoke and knocking during ignition by increasing the cetane number.

Winterization

In order to properly function in most winter climates, a winter fuel should include the following components: Anti-gel, heavy wax modifiers, de-icer, and Wax Anti-Settling Agent (WASA). Modern fuels are becoming more susceptible to cold weather-related issues. This is due in large part to changes in refining methods, new crude sources, biodiesel, and changes in engine design. Because of these changes, it is more important than ever to have a proven, conservative winterization plan in place throughout the winter.

Top Tier Diesel

Like gasoline, diesel fuel also has a newer “Top Tier” rating that for premium fuel.

Providers of Top Tier Diesel will be offering a better product than straight diesel fuel. However, the ratings requirements are not sufficient enough to ensure that the fuel will meet the needs of heavy duty modern engines.

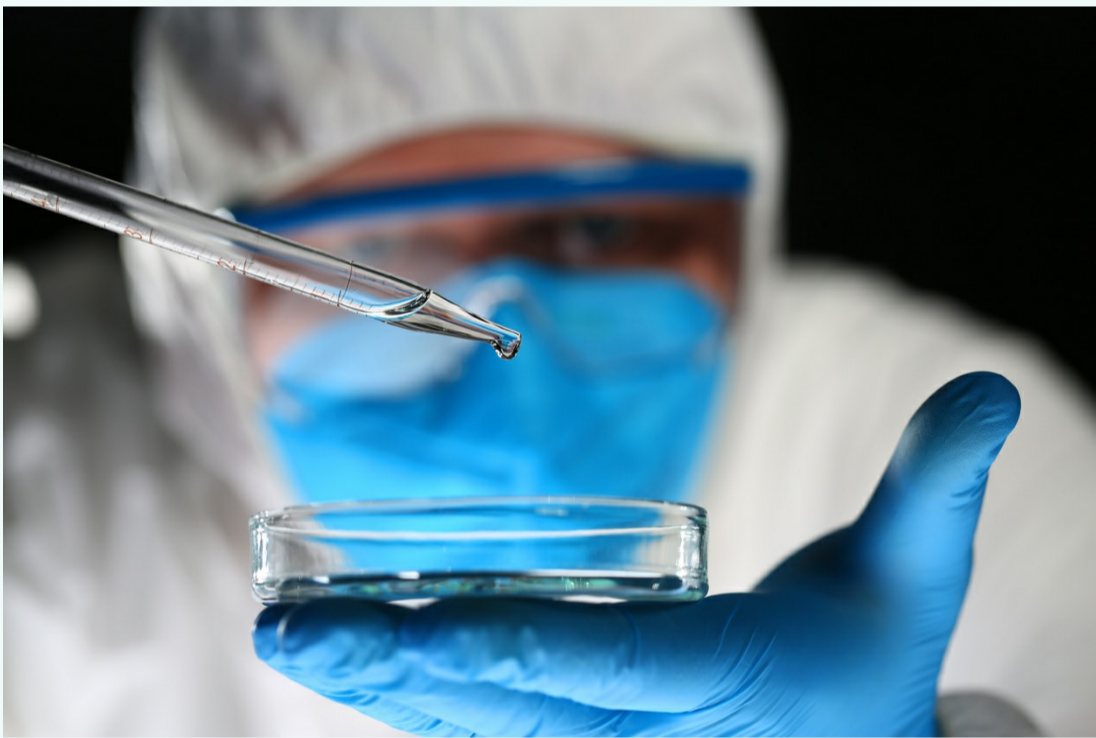
NCWM Proposed Premium Diesel Definition Recommendation (Post 2017)

- 1) **Cetane Number**, ASTM D613: 47 minimum
– ASTM D613 is the referee method; however, the following methods may be used to determine cetane number
–D6890 (IQT). –D7170 –D7668
- 2) **Corrosion**, NACE TM0172-2015: B+ rating minimum
- 3) **Filter Blocking Tendency**, ASTM D2068, procedure B: 1.6 maximum
- 4). **Injector Deposit**, CEC DW-10 B: 2 % maximum power loss
- 5) **Low Temperature Operability**, Cloud Point, LTFT, or a restricted CFPP: ASTM D975 Guideline
– CFPP should be limited to a maximum of 6 C below the cloud point of the fuel.
- 6) **Lubricity Wear Scar Diameter**, ASTM D6079: 460-micron maximum

Click [here](#) to read the focus group's recommendation in its entirety.

The official definition of premium diesel varies from state to state depending on their governing boards' requirements. Some states have adopted above outlined basic recommendations created by the National Council of Weights and Measures (NCWM) several years ago. Unfortunately, the NCWM's definition for premium diesel is, in most industry experts' opinions, too vague.

Distinguishing Your Premium Diesel Fuel Program in a Vague Marketplace



1) Proper Detergent Chemistry

Are you using a detergent line that not only excels in passing test specification standards, but is extremely beneficial in real world situations?

Current test requirements for detergent performance only expect a detergent to restore 98% of lost horsepower during testing.

However, detergents lines exist that will restore 100% of lost horsepower and renew engine performance to levels it had when it was brand new.

Specific detergents have proven to be highly effective at removing even the most difficult types of deposits that can form on modern engines.

Many other inferior detergent chemistries are specifically designed to minimally pass the requirements of certain tests. These detergents do not address other commonly occurring deposits that can form, rendering them very ineffective in most real world situations.



3) Providing Educational Services

A superior Premium Diesel Fuel program doesn't stop with proper detergent chemistries and fuels testing programs.

Implementation of educational training between additive suppliers, fuel supplier teams and customers is crucial to ensure a smooth and successful premium diesel fuel program.

What Does A Premium Fuel Program Provide The Fuel Supplier?	What Does A Premium Fuel Program Provide The Fuel Consumer?
<ul style="list-style-type: none">■ Allows for higher margins■ Distinguishes their fuel as premium and supreme in the fuel marketplace■ Provides highest possible quality fuel for consumers■ Relieves from stress of being a “low cost provider in the market”■ Provides a premium service, saving from competing on price alone	<ul style="list-style-type: none">■ Fuel designed to work best with modern engines■ Prevents fuel related issues■ Adds a barrier of protection■ Addresses winterization concerns■ Meets lubricity needs■ Meets needs of fuel designed for heavy duty engines■ Allows for less maintenance and downtime■ Maximizes the potential of fuel■ Protects expensive equipment



2) Exceeding Testing Requirements

What are the tests requirements and what does an “exceeds” rating mean?

Most specifications created to test fuel performance and define a “premium fuel”, like those of the NCWM, do not go far enough to ensure that fuels work optimally in modern engines.

Light Duty Engine Testing

Some Premium Diesel Programs rely on minimally passing the light duty engine testing. Some of these tests include the following: DW-10B, DW-10C, and XUD- 9 Tests. For these tests a fuel receives a simple “pass” or “fail” rating.

Fuels that simply pass the above testing trials perform only 1/3 as effective in providing real and noticeable improvement in modern engines.

To ensure that fuels work optimally in modern, heavy duty engines engines, it is imperative to select a Premium Diesel Fuel Program that exceedingly passes an specifications test. The additional DW-10C Test is Merit Based and a the premium diesel program select should score of 10/10.

Heavy Duty Engine Testing

(Applies to majority of premium diesel users in the US)

A vast majority of diesel engines used in the US are heavy duty engines. However, many premium diesel fuel programs shy away from running this important and rigorous test.

When selecting a premium diesel fuel program, choose one who has run the **Heavy Duty 6.8 Liter IDID Test**. The premium diesel test should result in 0% power loss for the engine.



4) Analyzing the Fuels Source and Winterizing Modern Fuel

More diverse crude sources and newer refining methods have worked together to create more difficult fuels to treat, especially during longer periods of extended cold. As a result, traditional anti-gel, heavy wax modifiers, and de-icers are not as effective as they once were.

Modern fuels are extremely susceptible to Wax Fall Out (WFO), and new formulations and chemistries are required to effectively treat these fuels.

Your Premium Diesel Fuel Program should test and analyze your fuel sources. Then, with modern treatment technologies, design a specialized line of winter additives. These need to contain the most effective combination of winterization chemistries in order to prevent Wax Fall Out from occurring over extended duration of cold weather.

Premium testing requires these new additives to keep wax in suspension for at least 72 hours at -15 F in lab testing.