DZL-LENE XL/10

High Performance Additive For Diesel Fuel and Gasoline

The Complete Package For A Cleaner, Smoother Running, Longer-Lasting Engine
Cummins L10 Depositing Test

Cummins, one of the world’s largest engine manufacturers, developed a severe test to measure injector deposits in heavy-duty engines. Certain engines developed injector deposits that led to a noticeable decrease in power, and Cummins analyzed the driving patterns of the affected fleets and a laboratory test method was developed to simulate these deposits. The test is run on two L-10 Cummins Engines in tandem to assess fuel and additive performance. The engines are run in 15 second cycles — one engine driving, the other being driven. The roles are reversed for each subsequent 15 second cycle and the duration of the test is 125 hours.

The injectors are examined by a Coordinating Research Council (CRC) after 125 hours and given a visual rating of plunger deposits. Cummins Criteria rates the findings as “Acceptable” if the CRC Rating is less than 25, and “Superior” if the CRC Rating is less than 10.

The graph shows the results of the L10 Deposit test on Dzl-Lene XL/10. Dzl-Lene XL/10 controls the formation of injector deposits in this severe test, and is rated as “Superior” in the Cummins L10 Deposit Test, with CRC Ratings less than 10.

(Dzl-Lene XL/10 exceeds the performance standards outlined by the Engine Manufacturers Association, which recommends a rating of 10 or less.)

Modified ASTM BOCLE Test (LZ Scuffing Method)

A modification of the ASTM D5001 BOCLE test (Ball on Cylinder Lubrication Evaluator) is performed to better represent the scuffing wear mechanism found in a diesel engine. Test are run on an untreated and treated base fuel. A non-rotating ball applies a force of 7000 grams to a cylinder rotating at 300 RPM, for a 2 minute duration. The wear scar on the ball is then measured.

The graph and test results show that Dzl-Lene XL/10 provides excellent anti-wear performance, resulting in a 35% improvement in wear. The anti-wear and lubricity properties of Dzl-Lene XL/10 will provide protection to fuel system components.
Rust Test Results

Dzl-Lene XL/10 helps protect fuel systems from rust and corrosion, as shown in the NACE (National Association of Corrosion Engineers) Rust Test. By reducing corrosion of fuel system components, Dzl-Lene XL/10 can increase engine life, reduce maintenance costs and improve engine performance.

<table>
<thead>
<tr>
<th>Additive</th>
<th>NACE Visual Rating</th>
<th>Rust (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>D (unacceptable)</td>
<td>50 - 75</td>
</tr>
<tr>
<td>Dzl-Lene XL/10</td>
<td>A (superior)</td>
<td>None</td>
</tr>
</tbody>
</table>

NACE Rust Test Results

HIGH FREQUENCY RECIPROCATING RIG (HFRR) TEST RESULTS

The HFRR test is the internationally accepted and standardized test method used to evaluate a fluids’ lubricative capability. The HFRR test, as applied to gasoline or diesel fuels, measures the amount of wear on a metal block before and after the treatment of fuel with a fuel additive. Original Equipment Manufacturers (OEM’s) have determined that a wear scar no greater than 460 micron, thereby requiring the use of a fuel lubricity additive, to meet equipment manufacturer warranty standards.

The graph and test results show that DZL-LENE XL/10 provides excellent anti-wear performance and greatly increases the lubricity of diesel fuel, providing outstanding protection against wear to fuel system components.
Field Test Results

A fleet of 22 Cement Trucks were used in a test of Dzl-Lene XL/10 — 11 were run with the product and 11 without. The trucks, with Cummins L10 engines, were run for approximately 18,200 miles and the injectors were rated.

At the end of the test, the units running Dzl-Lene XL/10 had injectors that were 44% cleaner than the base unit injectors.

The units running Dzl-Lene XL/10 also had more horsepower and better fuel economy.

Water Tolerance

Dzl-Lene XL/10 has a unique additive package to significantly control the effects of water in fuel. The demulsifier promotes the separation of water and fuel when water is excessive, preventing the formation of an emulsion. This helps fuel flow freely and allows free water to be drained from fuel storage tanks. In vehicle tanks, where fuel is recirculated, Dzl-Lene XL/10 allows a controlled amount of moisture to be absorbed and burned with the fuel, keeping the vehicle tank dry.

Emission Reduction

After the Cummins L10 Injector Deposit Test was run with low sulfur reference fuel and fuel treated with the Dzl-Lene XL/10 additive, the injectors were removed and placed in another L10 engine. The engine was then run on the transient emission cycle, which is used for on-highway certification of trucks in the USA and it has 3 phases that simulate driving in: New York City urban, New York City highway, and Los Angeles highway. The test is considered representative of real world driving conditions.

Dzl-Lene XL/10 additive greatly reduced emissions, compared to the fuel with no additive.

Dzl-Lene XL/10 provides excellent cleanliness within the engine, which leads to increased fuel economy.

Dzl-Lene XL/10’s cleanliness and lubricity properties help to maintain engines in like “new” condition, which maintains power.

Fuel additive has been registered with EPA per 40 CFR 79.23 Registration Number 0285-0006.