#2 ULSD PROBLEMS and HPCD SOLUTIONS

Finally, a purified diesel fuel that protects and performs

**Microbe contamination** clogs fuel lines and reduces combustion efficiency.
- **HPCD**'s refinement process removes all but trace amounts of sediment and waste.

**Corrosion in fuel lines and fuel tanks** occurs when water is inducted into the fuel from either condensation or use of hydroscopic additives such as ethanol.
- **HPCD**'s refinement process removes water and other hydroscopic elements without emulsification, which increases injector life.

**Gumming of fuel** takes place due to the presence of olefinic hydrocarbon fractions that are left over in the refining process. These “fractions” easily oxidize leaving a gum residue clogging the fuel system and does not burn efficiently.
- **HPCD**'s proprietary molecular correction technology motivates hydrocarbon fracturing and does not permit gumming and making HPCD the most stable diesel fuel available.

**Waxing of fuel** takes place in heavier fuels such as diesel or bunker fuel. When the fuel temperature drops below the pour point, the fuel transforms to wax. The wax clogs fuel lines or freezes fuel injection systems.
- **HPCD**'s pour point reaches -20°C.

**Carbon build-up** creates a heat-sink material that inhibits combustion and causes pre-ignition thereby reducing performance and causing extra wear.
- **HPCD** removes carbon deposits from the fuel and fuel system, thus the engine achieves greater performance, less emissions and decreased maintenance costs.

**Incomplete combustion** leads to harmful emissions and internal carbon build-up. This problem universally occurs in gasoline, diesel and turbine engines.
- **HPCD fuel** experiences a catalyzed combustion reaction optimizing combustion by transforming the hydrocarbon chain into equal lengths.

**Uneven heating of the combustion chamber** causes excessive wear. Inefficient combustion and is neither fast, nor symmetric. As a result, heat is not evenly disbursed throughout the combustion chamber, and early material fatigue sets in to that local area.
- **HPCD**'s enhanced properties protect combustion surfaces, valves and seats and create a catalytic environment that produces a complete, quick and efficient air/fuel burn rate.

**Exhaust gas temperatures** Today’s Ultra Low Sulphur Diesel or (ULSD) increases exhaust gas temperatures, increasing maintenance intervals and harms expensive exhaust components.
- **HPCD** exhaust temperatures are reduced, this equals longer maintenance intervals and lower operating costs.

**Cold starts** account for up to 90% of engine wear causing extremely adverse effects to vital engine components.
- **HPCD**'s purity, stability and cetane lower the cold start impact on the upper cylinder, valves and valve seats and piston rings.

**Lubricating oil contamination** caused by blow-by or engine wear forces contaminates to enter the oil and shortening the life of oil, filter, and sometimes the engine itself.
- **HPCD** virtually eliminates blow-by by virtue of its numerous capabilities including the ability to create a more efficient combustion environment, burning the combustion mixture complete removes the possibility of blow-by.

**Micro lubrication** is not a feature of ultra low sulfur diesel; it lacks the ability to properly lubricate the expensive engine components, pumps and injectors.
- **HPCD** tested 35% higher lubricity when compared to ULSD prolonged engine life by improving the lubrication properties of today’s low sulfur fuels, protecting the life of injector pumps and injectors.
Fuel contamination is a guarantee; fuel quality however, is not. For reliable engine operation and fuel system performance, a clean fuel supply is absolutely essential. Dirt, debris, water, rust, microbes and small particles are extremely damaging. If not trapped by the filter, such contaminants can plug fuel-metering orifices in the carburetor or prevent valves from seating. In fuel-injected engines, fuel debris can clog the injector inlet screens and starve the injector for fuel. And if debris gets inside the injector, it can wear or jam the pintle valve and seat. With diesel engines, clean fuel is even more important because of the extremely close tolerances inside the injection pump.