

# Gen49D

PowerSUM 

## THE SOLUTION FOR ULTRA LOW SULFUR DIESEL FUEL ISSUES

Gen49D is an alcohol free lubricant formulated to separate water and provide complete diesel fuel system performance improvements. Gen49D is specifically formulated to meet all manufacturers requirements including GM, Caterpillar, Cummins and Detroit Diesel.

### Primary Benefits of Gen49D:

- Increased Fuel economy
- Improved combustion
- Power Increase
- Increase Cetane Number
- Reduced engine wear
- Cleaner components
- Lower maintenance costs
- Reduced emissions
- Winter fuel/ AntiGel protection
- Excellent for Biodiesel
- Cold Start Performance

### INCREASES CETANE OF FUEL

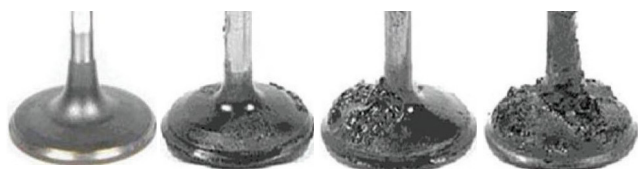


Higher cetane means better ignition quality. Gen49D will increase the cetane number of your diesel fuel by 2 to 3 numbers, which is important for efficient engine operation and emission control.

Cetane number is a measure of its ignition quality. High cetane number fuels will start to burn earlier in the compression stroke, important for efficient engine operation and emissions.

### Cetane Improvers Provide:

- Improved cold start performance
- Reduced fuel consumption
- Reduced engine noise
- Improved engine durability
- Decrease in Particulates, Nitrogen Oxides (NOx), Carbon Monoxide, and Hydrocarbon Emissions
- Reduce white and black smoke production



Gen49D

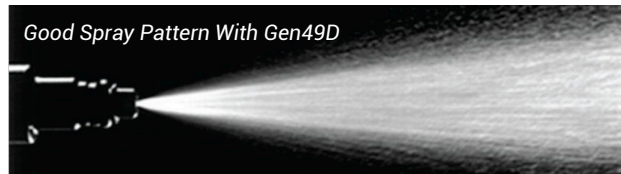
High Detergency

LAC Detergency

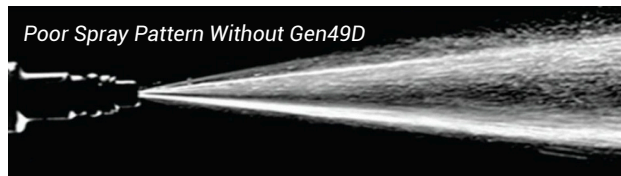
No Additive

Poor injector spray patterns result in poor combustion and fuel economy while injectors treated with Gen49D remain clean with a good spray pattern insuring optimal performance.

Good Spray Pattern With Gen49D



Poor Spray Pattern Without Gen49D



Ultra Low Sulfur Diesel today adheres to the regulations that have lowered the amount of sulfur in diesel fuel 97% from 500 ppm to 15ppm effective Sept 15, 2006.

The new ULSD specs are driven by the demand for reduced pollution. Sulfur is good in diesel fuel - not so good for the air we breathe.

This will greatly reduce environmental toxins which affect air quality around the world.

### Ultra Low Sulfur Diesel Fuels Adversely Impact Fuel Properties

**Lubricity** The processing required to reduce sulfur 97% also removes naturally-occurring lubricity agents in diesel.

**Cold Flow** The conversion of aromatics to paraffins will affect the cold flow of 515 fuel adversely. We can expect the cloud point and pour point of the fuel to be worse than with LSD (500 ppm).

**Energy Content** - In general, the processing required to reduce sulfur to 15 ppm also reduces the aromatics content and density of diesel fuel, resulting in a reduction in energy content (BTU/gal). This expected reduction may negatively affect fuel mileage.

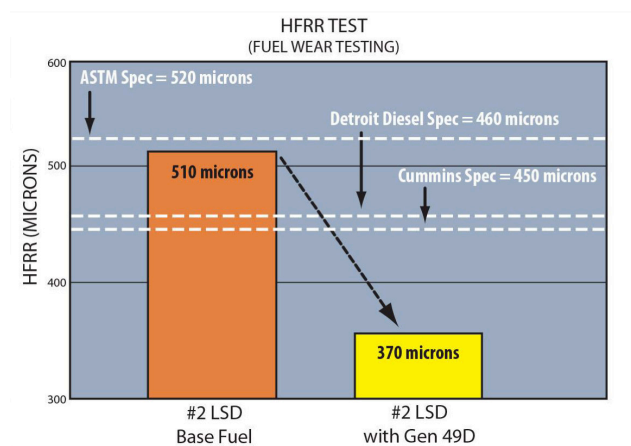
**Gen49D with Cetane is the additive that addresses any and all concerns related to the reduction of sulfur in diesel fuel!** It does this by first addressing the price at the pump. In repeat studies by a variety of users, Gen49D consistently offers fuel savings from 6% to 15%.

A High Frequency Reciprocating Rig (HFRR) is a machine used to test lubricity of fuel. Typical fuels measure approximately 510 microns of wear - failing to pass the standard of 460 microns. With Gen49D added, wear is reduced to 370 microns - well below the standard of 460.

**POWER-UP**  
**LUBRICANTS**

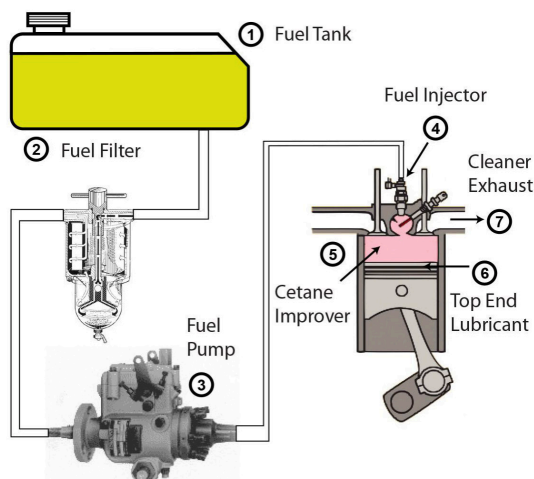
[www.powerupnz.co.nz](http://www.powerupnz.co.nz)

Power Up Lubricants NZ Ltd  
41 Hororata Road, RD 2, Darfield 7572, Canterbury  
Toll Free 0800 336 666



Gen49D is alcohol free and specifically formulated to meet all manufacturers' requirements including GM, Caterpillar, Cummins and Detroit Diesel and brings the fuel much closer to the specifications requested by the OEM's.

With the price of diesel expected to escalate, along with wear and tear on engine components due to ULSD, Gen49D with Cetane offers the results operators are looking for.



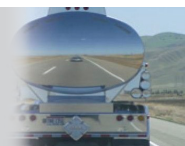
## The 7 Critical Functions of Gen49D:

- FUEL TANK** - Gen49D begins working in the preflame zone of the fuel system by putting a protective coating inside the fuel tank and lines and stabilizes the fuel which prevents water from causing rust and corrosion.
- FUEL FILTER** - By cutting down on rust and corrosion, fuel filters last longer. Note: Gen49D may cause fuel filters to become dirty when used for the first time as it will clean the system as it protects. This may require a quick filter change (especially in old or high mileage equipment).
- FUEL PUMP** - The only lubricant in the fuel pump is the fuel itself. Gen49D adds an environment friendly lubricant to the fuel to prevent excessive wear and premature failure of pumps and injectors.
- FUEL INJECTOR** - Gen49D is formulated with an injector cleaner that dissolves carbon and other power robbing deposits from the spray nozzle. This generates a better mist improving fuel combustion efficiency and cleaner emissions.
- CETANE IMPROVER** - Increasing the Cetane rating of diesel fuel will cause the fuel to atomize and ignite quicker. This creates a cleaner burn, more power and less smoke. Gen49D is equipped with Cetane Im provers and combustion enhancers that will increase the Cetane rating of diesel up to 3 numbers.
- TOP END LUBRICANT** - Creating a seal around the top ring is critical in preventing power loss and less blow by of gases into the engine oil. Gen49D creates this lubricating film on the fire side of the piston giving you a better explosion and more bang for your buck. This results in better fuel economy and improved horsepower.
- CLEANER EXHAUST** - In addition to reducing emissions and engine smoke, Gen49D will lower exhaust temperatures which shows that the fuel is burning up in the cylinder head, where it is supposed to, and not in the tail pipe.

## Cold Starting Performance

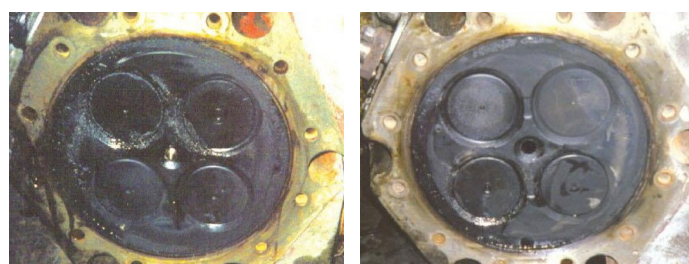
Starting your equipment each day can seem to be the easiest of all tasks....that is until it won't start. All the proprietary components of Gen49D working together ensure exceptional starting efficiency especially in cold conditions. Gen49D will save unnecessary strain on starters and high stress on batteries. One of the first benefits our customers report is how much easier their equipment fires after applying Power Up Gen49D for the first time.

**SAVES UP TO  
15% ON FUEL COST**



Gen49D contains a powerful synthetic lubricant package which reduces friction and wear in the top end of the cylinder, injectors and fuel pump. Poor fuel lubricity is commonly seen in new low sulphur fuels. Gen49D is approved for and surpasses the new standards for diesel fuel and exhibits wear and friction reduction significantly below typical levels. Poor fuel lubricity results increased maintenance costs, downtime and poor fuel economy.

## Train Cylinder Heads Comparison



Untreated cylinder head shows hardened carbon deposits in control unit #4203 severely inhibiting engine performance.

Cylinder head is clean with very small amounts of soft residue.

Gen49D protects your fuel pump, the injectors and top end of the engine from premature wear and failure, reducing costs and increases life over straight diesel fuel.

The preflame region before fuel enters the combustion chamber is only a small part of the complete lubrication protection offered by Gen49D. Gen49D is designed and formulated to lubricate the top end of the combustion chamber where the severe stresses of burning new, dry low sulphur fuels are causing premature wear and poor performance. Fuel injectors, intake and exhaust valves and piston rings are being subjected to more extreme conditions than ever before.

Using a modified ASTM D5001 Ball on Cylinder Lubricity Evaluation (BOCLE) the lubricity of diesel fuel can be measured. The test consists of a hardened steel ball bearing wearing against a rotating steel bearing race. Poor diesel fuel lubricity will result in increased wear on the steel ball.

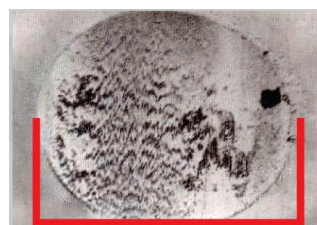


Figure 1 - .63 mm



Figure 2 - .36 mm

Figure 1 is a magnified picture of the wear scar left when only low sulphur diesel fuel is lubricating the wearing surfaces. The actual size of this scar is 0.63 mm across. The photograph in Figure 2 shows the wear spot left on the ball bearing when 0.08% Gen49D is added to the same low sulphur diesel fuel. The fuel's lubricity is improved dramatically. The wear spot with Gen49D is only 0.36 mm across. The area of the scar is more than three times smaller than with diesel fuel alone. It is also obvious that there is a lot less scoring of the worn area!

Gen49D protects your investment, prevents fuel system component wear and will improve your equipment's performance and service life!

## Anti-Gel Protection

Gen49D fights water and gelling the leading problem with winter fuel. Cold flow is improved up to 15°C. This gives your fuel the very best chance of flowing in extreme cold conditions.

Gen49D contains a powerful deicer that lowers the freeze point of water and prevents ice crystals from forming that may plug filters and cause misfiring. Additionally the antigel characteristic keeps crystal molecules from collecting or clumping to ensure problem free winter operation. Gen49D adds an excellent stabilizing package to your diesel fuel. High temperature stress on fuels results in degradation products such as particulate solids which may lead to injector damage and filter plugging. Gen 49D also fights the effects of oxygen and water in stored fuel, neutralizing the effect of water.

## Tests Show Positive Proof

New generation diesel fuels are now required to contain less than 0.05% sulphur and less than 35% aromatic content. This new, dry fuel has been implicated in increased wear of fuel system components, especially pumps and injectors.

## Gen49D: Great for Biodiesel

Biodiesel is fuel produced from organically derived oil combined with alcohol in the presence of a catalyst. It can be made from soybean, canola, waste vegetable oils or animal fats.

Although there are plenty of environmental benefits to using biodiesel there are still a few challenges such as:

- Lower energy content compared to petroleum diesel
- Cold weather performance
- Increased nitrogen oxide (NOx) emissions
- Short shelf life/Fuel stability.

Gen 49D with Cetane Improver is a multi-functional diesel fuel additive that can help with these challenges.

- Gen 49D contains a cold flow improver that can help lower the pour point of diesel fuel.
- Gen 49D contains cetane improver that will improve the combustion and performance of the fuel. Increasing cetane can also reduce NOx emissions.
- Gen 49D contains a fuel stabilizer that will improve the life of the fuel.
- The lower energy content of biodiesel refers to the btu's. Unfortunately, there is no additive that exists that can improve the btu's of biodiesel.

There are also some additional benefits that Gen 49D can provide:

- Fully synthetic lubricity improver for ULSD fuel
- Diesel detergent to keep the engine clean
- Corrosion inhibitor
- Wax Anti-settling additive.

Overall, the use of Gen 49D with Cetane Improver in diesel fuel or a biodiesel blend would benefit the performance and life of the engine.

## Product Application:

Gen49D with Cetane Improver should be added with each fuel fill at the rate of 0.05% (Summer) or 0.1% (Winter). Please see the below table for Blend ratio.

Gen49D to Diesel Lubrication Blend Ratio	
Summer Months 0.05% (0.5 ml per litre fuel)	Winter Months 0.1% (1 ml per litre fuel)
1 Litre treats 2000 litres of fuel	1 Litre treats 1000 Litre of fuel
4 Litres treats 8000 litres of fuel	4 Litres treats 4000 litres of fuel
10 Litres treats 20,000 litres of fuel	10 Litres treats 10,000 litres of fuel
20 Litres treats 40,000 litres of fuel	20 Litres treats 20,000 litres of fuel

## Gen49D is available in the following convenient sizes:

- 1 Litre Bottle
- 4 Litre Bottle
- 10 Litre Bottle
- 20 Litre Bottle

## DISTRIBUTED BY:



[www.powerupnz.co.nz](http://www.powerupnz.co.nz)

Power Up Lubricants NZ Ltd  
41 Hororata Road, RD 2, Darfield 7572, Canterbury  
Toll Free 0800 336 666