



## FAQ'S

**Why is GF2™ Fuel Enhancer better than other fuel additives on the market?**

It's the only one of it's kind in the world that has been formulated with a lubricant, water emulsifier, polymerization retardant, oxidation stabilizer and corrosion inhibitors. It is highly concentrated fuel additive. 1 ounce will treat 80 gallons of fuel.

**What exactly is in GF2™ Fuel Enhancer?**

Combustion Catalyst (Complex Organometallic compounds) , Lubrication, Water Demulsifier, Polymerization Retardants, Oxidation Stabilizers, Detergents and Corrosion Inhibitors.

**What does an Organometallic compound do?**

It lowers the initial ignition point of the fuel in the cylinder allowing more time for the fuel closest to the piston to burn more completely. Your engine only has a limited amount of time to burn all of the fuel in the combustion chamber before it is swept out to the exhaust. Without GF2™ , fuel is ignited from only one point in the chamber. The flame burns from the top down to the piston head. GF2™ contains Organometallic compounds that act as flame initiators. Because of this, the flame in your engine's combustion

chamber isn't propagating only from top to bottom. It's also propagating from all of the GF2™ molecules in the fuel. More of the fuel in the chamber will be burned on each stroke and less will be wasted in the exhaust.

This also allows more of the BTU's in the fuel to be released and used in the form of energy to deliver more power to the transmission and provide better overall fuel economy.

## How does GF2™ Fuel Enhancer affect the Cetane or Octane value of the fuel?

The cetane value of Diesel is greatly enhanced by using GF2 allowing for the diesel and all heavy fuels such as bunker fuel or No 6 fuel to burn more efficiently and cleaner obtaining close to the full Cetane value of the fuel. In gasoline engines you can use the lowest octane fuel with GF2™ to achieve the performance of a higher Octane fuel. This is a real money saver for everyone.

## Does GF2™ Fuel Enhancer increase the BTU's in the fuel.

BTU's are not increased in fuel with the use of GF2™ Fuel Enhancer. GF2™ is able to release more of the available BTU's that already exist in your fuel. Most engines do not burn all the fuel available in the cylinder and therefore do not utilize all the BTU's available. Unburnt fuel is expelled into the exhaust system creating smoke and pollution in the atmosphere. This unburnt fuel that is expelled in the exhaust creates the need for catalytic convertors in smaller vehicles and Regen systems in larger vehicles to burn off the unused fuel to reduce pollution. If the engine can burn more of the available BTU's in the fuel then there is less waste, more power and more economy and less need for DEF additive in Regen systems and less need for catalytic convertors to burn off unused fuel in the exhaust system.

BTU is a British thermal unit which measures the amount of energy in a particular fuel. It is a similar measure to that of a calorie. For example: Regular unleaded gasoline contains 114,100 BTU's. No 2 Diesel contains 129,500 BTU's. Liquefied Natural gas (LNG) contains 75,000, Liquefied Petroleum Gas (LPG or Propane) contains 84,300, Bio Diesel contains 118,300.

## How does BTU's relate to horsepower and fuel economy?

The more of the available BTU's the engine uses the more efficient it is. The price of the fuel must be taken into consideration that the application it is going to be used in. For example a large earth moving machine in a mine will be more efficient using No 2 Diesel with 129,500 BTU's as it has more BTU's per pound of fuel than if the same machine was using LNG which has 75,000 BTU's. It would take 55,500 more BTU's of LNG to create the same power of No 2 diesel. This would mean using larger tanks to contain the fuel and a larger engine (meaning larger cylinders and pistons, valve openings etc.) capable of creating the power necessary to achieve the same results as the diesel engine can achieve.

## Why does GF2™ Fuel Enhancer contain a lubricant?

Yes, On road diesel fuels today are almost completely sulfur free. On road gasoline's are almost completely lead free. Sulfur and Lead are natural lubricants. Today's high performance engines are subject to much more wear and breakdown when not lubricated properly especially in the fuel injectors and valve systems. GF2™ lubricates the upper cylinders, valve system and the entire fuel system minimizing breakdowns and ensuring long component life.

## Why does GF2™ Fuel Enhancer contain a Water Demulsifier?

All fuels contain some degree of water. Water is naturally in the atmosphere and with each 24 hour period of day (warmer) and night (cooler) condensation is formed inside fuel tanks and fuel lines including engines. Water in fuel makes it less efficient in the engine and also causes acids which are harmful to the engine and exhaust system. GF2™ separates water from the fuel allowing the fuel going into the engine to burn more completely.

In this article by American Filtration and Separations Society, One of the most commonly thought of sources of water contamination is through condensation of atmospheric moisture to form liquid water. A research study shows that an empty 200 gallon fuel tank could contain a maximum amount of 22.8 grams of water vapor at 86°F, and 12.92 grams at 50°F[1]. These values do not account for all of the water observed. Condensation is only one of the many ways in which water can contaminate fuel tanks. Fuel travels through several intermediate facilities prior to reaching the end user. It travels from refineries, is pumped through pipelines, is shipped via truck and is stored in tank farms before reaching the fuel stations. <http://www.afssociety.org/automotive/93-water-contamination-in-fuel-cause-and-effect>

## Why does GF2™ Fuel Enhancer have a Polymerization Retardant in it?

Fuel naturally begins to breakdown soon after it is refined. Eventually over time it returns to its natural state as crude oil. This polymerization process starts to form submicron-sized particles. As the process continues, particles become larger and eventually agglomerate, forming macroscopic sludge. These particles can score injectors and eventually plug filters and the very small

openings in the injectors nozzles and over long periods of time render the fuel un-pumpable. For example have you ever left your boat or lawnmower long periods of time without using it? It becomes very hard to start it because of this polymerization process. GF2™ Fuel Enhancer disperses existing macroscopic sludge and retards further polymerization, permitting the fuel to flow and burn more efficiently.

## Why does GF2™ Fuel Enhancer have an Oxidation stabilizer?

All fuels are subject to oxidation. Oxidation creates in-soluble by products which cause injector deposits. These deposits can slow response or cause sticking of moving internal parts and lead to injector failure. GF2™ contains a dispersant that stabilizes fuels, preventing oxidation.

## Why does GF2™ Fuel Enhancer have corrosion inhibitors?

Many parts of an engine are made up of ferrous metal components, aluminum and plastics. Many fuels today contain Ethanol which is alcohol and is highly corrosive to a variety of components in your fuel lines and engine. GF2™ contains a corrosion inhibitor in order to mitigate corrosion in tanks, engines and fuel lines and a detergent to help keep engines, fuel lines, filters, pumps and injectors clean. This will result in increased efficiency, less breakdowns and less maintenance for your equipment.

## Is GF2™ Fuel Enhancer beneficial for use in Biodiesel?

GF2™ is excellent for use in Biodiesel fuels. Biodiesel has less BTU's than No 2 diesel. Biodiesel is much more prone to higher water content minimizing it's effectiveness as well as being subject to faster fuel degradation than regular diesel. GF2™ is ideal for use in this type of fuel, not only to stabilize it, but also allowing it to burn more effectively and obtain much more of the available BTU's while eliminating the water content to make it more efficient.

## How long has GF2™ Fuel Enhancer been in use?

GF2™ has been in use since the early 1990's. It is proven in all heavy industries with the emphasis on mining. However we are currently making it available to the general public so they can benefit from it amazing properties.

## Can GF2™ Fuel Enhancer reduce pollution?

Yes GF2™ is very effective at reducing carbon and greenhouse gasses up to 70%. It does this by burning more of the available BTU's in the fuel and burning the fuel in the engine more efficiently; this gives more horsepower and more fuel economy, which means you use less fuel to go the same distance or complete the same amount of work.

## Why was GF2™ Fuel Enhancer not available to the general public?

Heavy industry has been the primary user of GF2™ .Our goal is to make this fuel additive available to the general public via network

networking enabling us a simple way to get the product to small fuel users . We believe by doing so we will create a greener environment for our world.

## Can GF2™ Fuel Enhancer's interaction with fuel be explained using a chemical formula?

The basic principles behind the benefits and catalytic effects of GF2™ are easy to understand. Today's engines leave some amount of fuel unburned on each piston stroke. GF2™ makes it easier for your engine to burn more of the fuel in the cylinder. Since more of the fuel is being burned, more power is being generated. Since less of the fuel is being wasted, you will have fewer emissions.

### Chemistry

An engine converts fuel into energy by the following chemical processes:

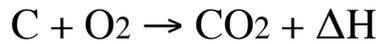
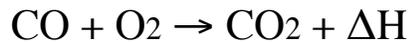


The  $\Delta H$  is known in chemistry as enthalpy and represents the energy created from the thermodynamic process taking place inside an engine. The  $C_xH_y$  represents the fuel, for example gasoline is  $C_8H_{18}$  and diesel is  $C_{12}H_{26}$ . The  $CO_2$ ,  $H_2O$ ,  $CO$ ,  $HC$ , and  $C$  on the right side of the arrow represent products that are released in the engine exhaust.

There are no exothermic (i.e. energy producing) reactions that could yield more energy out of the  $CO_2$  or  $H_2O$ , so we've grouped those components together in the equation above. However, there are exothermic reactions that can extract additional energy from the second group: the  $CO$ ,  $HC$ , and  $C$ .

When GF2™ is introduced into the engine, it acts as a catalyst and lowers the activation energy needed to further break down the unburned products in the above reactions. Specifically, when

GF2™ is used the following additional chemical processes take place in the engine:



The  $\Delta\text{H}$ 's in the three above equations are how GF2™ increases your engine's output. These  $\Delta\text{H}$ 's add to the  $\Delta\text{H}$  produced by the engine's standard process to deliver more output energy from the engine. This extra energy can be used to either increase engine output power (if the amount of fuel input is kept constant) or reduce the engine's fuel intake (if the amount of output power is kept constant).

### Flame Propagation

Your engine only has a limited amount of time to burn all the fuel in the combustion chamber before it's swept out to the exhaust. Without GF2™, fuel is ignited from only one point in the chamber. A red flame burns from the top down to the piston head. GF2™ contains compounds that act as flame initiators. Because of this, the flame in your engine's combustion chamber isn't propagating only from top to bottom. It's also propagating from all of the GF2™ molecules in the fuel. More of the fuel in the chamber will be burned on each stroke and less will be wasted in the exhaust.

### Pressure Measurements

Sensors inside laboratory engines have shown that GF2™ changes the pressure cycle inside the combustion chamber. Since the average pressure is greater inside the chamber, the piston will receive more force driving it down. Since the piston is being driven down faster, more output power will be delivered to the crankshaft resulting in efficiency improvements.

Q. Can GF2™ be used by the shipping industry for heavy fuels such as No 6 diesel fuel (Bunker fuel)

A. GF2™ is ideal for use in shipping industry.

The treatment ratio is:

1:5,000 after use over 1,000 hours the treatment ratio can be extended 1:7,000

1 gallon of GF2™ will treat 5000 gallons.

1 liter of GF2™ will treat 5000 liters

After 1,000 hours 1 gallon of GF2™ to 7,000 gallons bunker fuel.

1 liter of GF2™ will treat 7,000 liters fuel.

As a Combustion Catalyst

GF2™ is a burn rate modifier. Due to its organometallic compounds, it lowers the initial combustion point temperature, burns the lower end BTU's, and allows a longer resonance burn time with fewer emissions.

Sulfur Content. Bunker fuel is exceptionally high in sulfur. GF2 stabilizes the sulfur molecules reducing the sulfur emissions of SO<sub>2</sub> and SO<sub>3</sub> about 10% on average. The remaining sulfur passes through as particulate matter. SO<sub>2</sub> and SO<sub>3</sub> form gas that when released into the atmosphere combines with water during the condensation process and forms acid rain.

Polymerization Retardant

Bunker fuel has a longer molecular chain; almost 3 times longer than diesel fuel. This means it is more difficult for the longer molecule to get enough oxygen for a complete efficient burn. The polymerization retardant in GF2™ Fuel Enhancer will delay the process of the fuel returning to crude oil and creating even longer molecular chains. Cracked fuels begin to deteriorate immediately after they are refined. As fuel ages in storage, it re-polymerizes, forming microscopic particles that score fuel-metering injectors. As re-polymerization continues, the molecular chains become longer and longer, forming large agglomerates (macroscopic

sludge). Eventually, the fuel may become un-pumpable and even noncombustible in some cases.

GF2™ keeps these carbon chains from combining, keeping the fuel stable and eliminating it from returning to its crude state. Less sludge means more available BTU's and more horsepower to the drive and less manpower required to clean out the sludge in the holding tanks.

GF2™ disperses existing macroscopic sludge, retards further polymerization, and permits fuel to be combusted efficiently with fewer emissions.

GF2™ Fuel Enhancer

Reduces engine carbon build up.

Reduces engine wear from carbon build up Reduces de-carbonization maintenance.

Significantly extends the life of pistons, liners, injectors, and valve train components etc.

Engine oil lasts longer due to less carbon in the oil sump/pan.

Engines last longer due to less wear caused by carbon particles in the oil.

Contains Water Demulsifier and Detergents

Bunker fuel contains approximately 2% water. GF2™ removes water from the fuel. It also helps eliminate sludge, and solids from forming and collecting in the fuel tank and fuel lines. It increases the life of filters, injectors, and fuel pumps caused by the above problems. The demulsifier and detergents will separate the water and reduce the solid particles in the fuel. GF2™ will help maintain a clean fuel system, free from water, sludge, and corrosion.

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### 1) FUEL STABILITY

- a) Removes water from fuel
- b) Eliminates existing solids in fuel
- c) Prevents polymerization
- d) Stabilizes fuel in tanks for many years allowing for the bulk purchase of fuels when they are inexpensive.

### 2) FUEL ECONOMY

- a) Increases available BTU's per pound of fuel @ minimum 3.5%
- b) Improves fuel economy and/or horsepower
- c) Dramatic reduction in fuel sludge
- d) Keeps oil cleaner
- e) Lubricates fuel system

### 3) REDUCED MAINTENANCE COSTS

- a) Longer life for pistons and rings (B&W MAN – 12,000 hrs. to 18,000 hrs.)
- b) Reduce hard carbon deposits 60% to 90%
- c) Dramatic reduction of tank cleaning from fuel sludge (saves manpower hours)
- d) Prevents fuel tank corrosion
- e) Reduces combustion system wear
- f) Prevents catalytic oxidation

### 4) ADDITIONAL BENEFITS FOR “INTERNAL COMBUSTION ENGINES”

- a) Reduces vanadium, sulfur, and sodium deposits in the combustion chamber and exhaust spaces (valves, turbochargers)
- b) Reduces or eliminates need to water wash turbocharger gas side
- c) Dispenses existing macroscopic sludge and stops further re polymerization

- d) Helps eliminate filter plugging
- e) Extends engine life
- c) Reduces soot, smoke, and particulate emissions
- d) Prevents the conversion of sulfur to SO<sub>2</sub> and SO<sub>3</sub>.

## Can GF2™ Fuel Enhancer be used in Power Generators to make Electricity?

Yes. Some Power Generating stations use engines and heavy fuels similar to the shipping industry. See explanation on how Can GF2™ is used in the shipping industry.

## Can GF2™ Fuel Enhancer be used in Open Flame Boilers?

Yes. The following is a synopsis of a test done at Grupo Fertinal in Mexico. (Full report on file) It was determined that a fuel consumption and emissions reduction analysis should be conducted on two (2), 100 ton-per-hour steam plants utilized for the production of commercial fertilizers. The test units selected for this procedure were unit CA-001, a Babcock and Wilcox, 100 ton-per-hour boiler, and CA-003, a 100 ton-per-hour Rey boiler. CA-001 was operating at roughly 56.22% efficiency at baseline, while CA-003 was operating at about 18.82% efficiency.

The data showed that the average improvement in fuel consumption, for the test burner evaluated was 4.6% during dynamic testing, using the CMB test procedure and 3.9% using in house volumetric fuel consumption flow meters.

The treated burner also demonstrated a large percentage reduction in soot particulates in the range of 27% and reductions in harmful exhaust related carbon fractions. Carbon dioxide reductions, based

upon the measured reduction in fuel consumption, are also substantial.

Steam production was also increased by 2.5% in CA-001. Prior to cleaning, Fertinal employees reported an absolute efficiency increase of 4.18% (18.82% to 23%) in CA-003. When applied to steam generation in tons-per-hour, this represents an increase in steam production of close to 20%.

## Can GF2™ Fuel Enhancer be used in propane or natural gas?

Yes, GF2™ can be used in all hydrocarbon based fuels. The challenge is the delivery process to combine the GF2™ additive with the natural gas or propane.

## Why do you recommend GF2™ Fuel Enhancer be double dosed for the first 3 or 4 tank fills on Diesel Fuel?

Engines using diesel fuels naturally begin to build carbon deposit and varnishes on pistons, cylinders, valves, injectors, cylinder heads etc. By using twice the recommended treatment for the first 3-4 tank fills GF2™ will burn off all these deposits, making your engine as clean as when it was new and operating at its best.

## Do I have to double treat a new engine with just a few miles/kilometers on it with GF2™ ?

No it is not necessary to double treat a new vehicle unless you reside in a place which has really bad low grade fuel. Just using the regular treatment of GF2™ will keep your engine clean just like when it was new and keep the upper engine components, injectors, valves, fuel pumps etc operating at peak performance.

## What do I do if I get GF2™ Fuel Enhancer on my skin, clothes or eyes?

First Aid: If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical attention immediately. In case of eye contact flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. Remove contaminated clothing. wash contaminated clothing before re-use. If ingested do not induce vomiting, keep warm, get medical attention. Acute Health Hazards: Eyes – Can cause irritation, redness, blurred vision and possible permanent damage. Skin – Prolonged contact can cause irritation, dermatitis. Ingestion – Harmful or fatal if swallowed. Can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Inhalation – High concentrations can cause irritation, dizziness, nausea, fatigue, headache and unconsciousness or asphyxiation. Warning: DO NOT TAKE INTERNALLY. Prolonged or repeated overexposure can cause organ damage and an increased risk of cancer. KEEP OUT OF REACH OF CHILDREN. For emergency, call your physician, local poison control center or local emergency room or call (800) 424-9300, for other information call (505) 892-9601.

Handling and Storage: Protect from physical damage. Store in a cool, dry ventilated area away from acids, alkalis and open flames. For additional safety information, refer to the Material Safety Data Sheet for this product.

Disposal: Place opened, empty containers in normal refuse for disposal. Contact your sanitation department or hazardous waste coordinator for information concerning disposal of unused product.

Accidental release measures: Clean spill with absorbent materials. Eliminate ignition sources. Use full face NIOSH approved organic respirator if TWA/TLV limits are exceeded. Avoid runoff into storm sewers and ditches which lead to waterways.

## Is GF2™ Fuel Enhancer hazardous and toxic?

Yes GF2™ is hazardous and toxic. Read instructions on use carefully. However when used properly in your engine it is rendered harmless.

## Why does the GF2™ Fuel Enhancer bottle state it does not meet EPA 2007 sulfur standards.

As a stand alone product on the shelf it does not meet the 2007 low sulfur standards. But when diluted in fuel the sulfur content is negligible and more than meets the EPA 2007 low sulfur standards.

## How do I calculate the correct amount of GF2™ Fuel Enhancer to use in my vehicle.

1 oz (29.57ml) of GF2™ will treat 80 gallons (302 liters) of fuel either gasoline or diesel. 10ml will treat 20 gallons (75.60 liters) 20ml's will treat 40 gallons (151 liters).

## How do I use the GF2™ Fuel Enhancer bottle?

Watch our video in the HHG University.

The GF2™ bottle is simple to use. Make sure the cap is on tight.

Turn the bottle upside down and fill the reservoir until it's full.

Turn the bottle until the scale and window is facing you and you can see the liquid in the window.

Let's say you only want 10ml's of additive. You will notice 2 scales one on either side of the window where the reservoir is. The scale on the right hand side indicates the measurement in ml. The scale on the left hand side is the measuring scale. The scale on the left hand side determines the amount of fluid which will show up in the reservoir on the right hand side scale.

With the scale and window facing you, tip the top of the bottle away from you until the fluid reaches the lowest scale on the left hand side of the window for 10ml. Once the liquid in the reservoir reaches the lowest mark of the scale on the left hand side of the window (10ml) then just tilt the bottle a little further until you gauge approximately 10 ml. When you set the bottle up vertically you will have the correct amount of additive in the reservoir and on the right hand side where it should show 10ml. For larger amounts of additive use the next scale above.