

Hydrogen Fuel Systems Pty Ltd

Hydrogen Enhanced Fuel Systems



Director
Gavan Knox

Simply a Hydrogen Enhanced System (HES) is

- An intrinsically safe system that produces hydrogen/oxygen on demand – No storage risk
- This is done by a electrical reaction induced by charging stainless steel plates – to crack water
- The gas generated is then added to the intake air of an engine



What will a “HES” do for you

- Decrease fuel use < 30%
- Increased power/torque at lower RPM
- Decrease exhaust particulate matter
- Engines run cleaner and smoother
- Reduce maintenance costs
- Increase the engine life span



Why use Hydrogen Fuel Systems Pty Ltd Hydrogen Generator

- Hydrogen Fuel Systems - builds alternative energy systems for use in combustion engines, that improves Fuel Efficiency, Power, Torque and reduces the toxic gases
- Hydrogen generators are not new however Gaven Knox has patented modifications
- That allow for more efficient gas generation by:
 - a. Stainless Steel plate design and placement - better water flow
 - b. Porting – better water flow
 - c. Pumping – better water flow

Better Water Flow

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Better Gas Generation



Why use Hydrogen Fuel Systems Pty Ltd Hydrogen Generator

- Greater efficiency means less electrical load to produce the desired volume of gas
- 12.5 % to 20% of the engine capacity in litres/min



Facts about using the H.F.S. Systems.

Fuel Savings

- Introducing hydrogen to diesel, petrol or LPG fuelled engine results in significant fuel savings, by
 1. allowing a leaner air/fuel mixture
 2. thoroughly burning all the fuel introduced to the engine
 3. increasing the power output of the engine
 4. increasing the efficiency of the engine thereby reducing the “throttle “ setting required to achieve the engine speed and vehicle speed
 5. Ensuring the valves, piston head and cylinder head is free of carbon build-ups which would otherwise interfere with the air/fuel flow in the cylinder and reduce engine efficiency

Cleaner Emissions

- Using Hydrogen in engines the fuel is “ flashed” at a much higher temperature allowing the fuel to burn more completely. A leaner fuel mix ensures better combustion resulting in less unburnt fuel/ hydrocarbons being passed through the exhaust system

Cleaner engine.

- By having better combustion there is less wasted fuel producing buildups on the valves, pistons and cylinder heads.
- With less contaminants of incomplete combustion the lubrication fluids remain cleaner providing better protection for the engine

Technical Stuff

- The HFS system is designed to use all the available electrical *energy* by using a series of independent active double electrolysis cells. These three cells use 4.4 Volt each running at 18 amp so that 13.2 volt (battery voltage) is used in total. No wasted voltage / energy / power.
- High speed jetting and porting , together with hydro-dynamically designed electrolysis cartridge , reduces the amount of wasted thermal energy to a minimum and optimizes the percentage of electrical energy converted into electrochemical energy
- Other systems use Buoyancy to circulate the fluid rather than a high pressure pumping system . Consequently the diffusion coefficient which measures the rate at which active chemical pass the plates , is very low due to the laminar/nil flow
- High pressure pumping forces turbulent flow to occur and consequently a very high diffusion coefficient. The active hydrogen ions are brought nearer the plates and more gas is generated with less heat

**Simply a more effective and efficient system
is attained by using high pressure high volume pump**

More Technical Stuff

- **Other manufacturers are all based on the same inefficient design using “Neutral” plates rather than individual cells , to break up the applied voltage into six 2.2 volt steps.**
- **This “Neutral” plate arrangement does not work resulting in massive over-voltage of 11 volts for one cell producing enormous heating of the water and steam generation rather than hydrogen generation**
- **When the hydrogen gas mixes with your gasoline it increases the Octane rating and the amount of compression required before the gas ignites. The piston must then compress the fuel completely before it ignites, and the extra hydrogen allows the fuel to burn more completely reducing the amount of waste (emissions). This also adds a bit more power to the engine, which increases its efficiency and improves your km per liter.**

More Technical Stuff

- Hydrogen ions and hydronium are in very low concentration in water. It is these that are
- producing the gas , not water. By changing the geometry of the electrochemical systems and
- fluid dynamics then it is possible to use only the Water rather than have to introduce
- concentrated electrolytes with damage the system
- Chemical etching of the plates of ss316L ensures that electro-stripping does not occur and plate life becomes much much greater.



Who can you cater for.

- Cars, trucks, busses, boats, generators, pumps etc.
- HFS systems are well suited to any vehicles or engines that are powered by petrol, diesel or LPG.
- Large companies, small business owners and the average punter can achieve savings using the HFS system to assist fuel their diesel, petrol or LPG fuelled engine.



Gen 10 and Gen 15 Systems



Gen 10.2 hydrocell...save fuel up to 50% ... increase Power / torque up to 25%
glknox@dodo.com.au
<https://www.youtube.com/watch?v=ZHWAKseqkYE>
for engines up to 5 litre capacity



Gen 15 systems for work vehicles and small trucks up to 8 litre... increase Fuel economy ... use water to make hydrogen
+610403177183
glknox@dodo.com.au

Gen 20 System



Gen 20 custom made units in Twin Gen 20 and single Gen 20 hydrocell ordered by R.Bainbridge , Townsville , Australia for his 19 Litre diesel powered Trawler. System mounted in checkerplate enclosure. Delivering increased Power , torque and increased economy to fuel hungry Trawlers.

Who is Gavan Knox?

Background.

- Gavan Knox is a professional Scientist / teacher / university qualified researcher with 35 years full time experience

Credentials.

- Bachelor of
- Physics,
- Engineering,
- Education (chemistry)
- currently completing Masters in Chemical engineering (metallurgy)



Mission statement

- **What drives me to do what I am doing.**
- Having been an educator / teacher and research Scientist for the past 35 years I have been able to attain knowledge to develop an alternative fuel system to help reduce the environmental stress on our fragile planet.
- I see that reducing pollution due to the incomplete combustion of fossil fuels is a major risk to my children's future and lifestyle. This pollution problem can be partially rectified by introducing Green / Clean Hydrogen fuel technology.
- Being a parent of 6 children and in particular two Baby girls I desire to be able to put my extensive education to use into protecting the environment which my young family will inherit.
- Finally I wish to protect my family as any father and see that my HFS systems will do this for them as well as providing the people of the world a better option, a safer option, a cleaner option and a cheaper option than indiscriminately burning fossil fuels.

Web site information.

- Contact details etc.
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<http://www.hydrogenfuelsystems.com.au/>
Run your vehicle on HYdrogen from water

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