

SNOW TEST

Fitch Fuel Catalyst

It's been a few years since we first introduced you to a strange little plastic/nylon cage of what appeared to be metal pellets that you drop into your gas tank or gas cans, called Fitch Fuel Catalyst. We admit, we were very skeptical of the claims it was a "mini-refinery" able to keep gasoline (and diesel fuel) fresh almost indefinitely.

Since that introduction, we have been using these things in most every gasoline-powered engine we own. We continue to experience nothing but fresh fuel and seemingly an elimination of fuel related problems with all of our seasonal equipment when using Fitch Fuel Catalysts to pre-treat our gasoline. The FFC metal pellets do not dissolve, but constantly act upon the fuel's hydrocarbon molecules to keep fuel fresh, preventing degradation due to bacteria, yeast, and mold.

Storing a marine engine with a half tank of "old" fuel? This used to be a big no-no, but now it is a non-issue. Have you ever had to dump all the old gas out of your lawnmower because it wouldn't fire? Now it doesn't matter. With a Fitch in the tank, all of the seasonal equipment, whether it is mowers, trimmers, blowers, tractors, they all start easily every time. No more fuel related problems. Year after year. No green crap, no varnish, no gum, and the gas acts like it is still of a "premium" grade. Gasoline treated with a Fitch Catalyst does not appear to go stale – even after six months it does not lose octane, it actually seems to get better. Think of it as a fuel stabilizer, mold-bacteria-yeast inhibitor, octane booster, your "fuel sentry".

One of the largest fleets of gasoline-powered equipment that sits idle for long periods of time but needs to operate properly at a moments notice is in the hands of the U.S. Military. How do they keep the gasoline fresh in all of their vehicles?

The federal government recently awarded \$4 million to Advanced Power Systems International (APSI), makers of the Fitch Fuel Catalyst. The money was awarded to APSI for two projects involving the Fitch Fuel Catalyst. Three million dollars will be spent by the U.S. Navy to purchase the permanent pre-combustion fuel catalysts from APSI for 4,000 of the service's biggest fuel guzzlers, including patrol boats, escort boats, security boats, tugs and workboats. The other \$1 million will be used for further fuel catalyst research on ground-based vehicles.

Like we stated, it has taken a few years for us to slowly realize there was more here than



a bunch of hokey. What does the Fitch Fuel Catalyst really do to the fuel? It induces a series of chemical reactions among the molecules present in pump grade fuel. It is manufactured and sold in the form of a metal alloy, not a liquid additive, and is installed so that it is in contact with the fuel on board the vehicle either in the fuel tank or in the fuel supply line of gasoline or diesel powered equipment. It is a catalyst that performs its function for a long time without requiring replacement. It has been tested to be effective in excess of 250,000 miles and 5 years of use.

What Is a Catalyst?

A catalyst is a substance that increases the rate, or speed, of a reaction, at some temperature, without itself being transformed. A catalyst does this by reducing the energy required for the reaction to occur, thus saving energy, time and money.

For example; a vessel containing hydrochloric acid and tin will be stable. Upon adding a minute dose of a few hundredths of a grain of platinum, hydrogen gas will begin to boil off. At the end of the reaction, the platinum is in its original condition.

The Fitch Fuel Catalyst induces chemical reactions among fuel molecules at low temperatures such as those our vehicles and fuel tanks experience and it returns to its original state at the conclusion of the reaction ready to initiate a new sequence.

Reformulation of Hydrocarbon Fuel

Hydrocarbon fuels are complex. Most of us think of fuels (such as gasoline) as a homogeneous commodity without realizing that it is not perfect or uniform. As purchased at the pump, fuel is a mixture of about **forty** primary but as many as a **thousand** secondary different species of hydrocarbon molecules. If fuel were pure there would be few or only one type of molecule. Natural gas types of molecules are too short and light, and asphalt types of molecules are too long and heavy, yet many of these light and heavy molecules are in the gasoline and diesel fuels available at the pump.

Refineries, where fuel is manufactured from crude oil, cannot remove many of the poorly performing molecules to make a more ideal fuel. In addition, once fuel leaves the refinery or is stored it is subject to attack by oxygen, ozone, and microorganisms (bacteria, yeast, and mold) that grow in the fuel. All these processes degrade the fuel to make a poorer product that prevents engines from performing at optimum levels.

This poor fuel does not combust completely in engines and does not yield its maximum potential energy. Some of it forms carbon deposits and gums, and some is not completely burned putting unburned hydrocarbons into the exhaust. Over time, engines develop problems caused by sub-optimal fuel. These include gumming and constriction of fuel systems and carbon deposits in the combustion

chamber and exhaust system.

This is one reason that today's automobiles need an exhaust catalytic converter to reduce toxic emissions. These toxic gasses (Unburned Hydrocarbons UHC and Carbon Monoxide CO) would not exist if the fuel / energy conversion in the engine was perfect. Exhaust system catalytic converters provide an environment for a chemical reaction where unburned hydrocarbons completely combust, hence the combustion process continues but outside the engine combustion chamber where no useful energy is extracted. Over time, engines develop problems caused by sub-optimal fuel including gumming and constriction of fuel systems and carbon deposits in the combustion chamber and exhaust system.

What Does It Do To The Fuel?

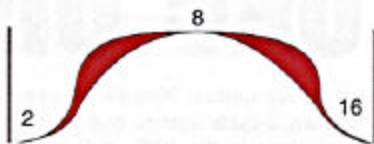
The Fitch Fuel Catalyst minimizes the population of less desirable molecules present in fuel and uses them as building blocks to increase the population of desirable molecules. The resulting highly uniform and potent fuel molecules burn uniformly and completely. This yields greater pressure on the piston. This is where the improved Torque, HP and fuel economy come from. More complete combustion also results in a reduction in Unburned HC, CO, and NOX in the exhaust stream.

A simple example will easily demonstrate this conversion. Draw a "classic" bell curve on a piece of paper. This represents the distribution curve of any hydrocarbon-based fuel (gas, diesel, etc.). In the center of the bell curve are the most efficient burning fuel molecules i.e.: the molecules that produce the most energy during combustion. On the left side of the bell shaped curve are the light, or short-chain, molecules that burn too fast in the combustion chamber causing ping or knock. On the right side of the bell curve are the heavy, or long-chain, molecules that burn too slowly or not at all, contributing little or no energy to the combustion process and resulting in carbon build up, plug fouling and emissions.

Take the bell and assign the molecules in the middle of the curve the number 8. These are the molecules that produce the optimum energy. Assign the left hand side of the bell curve the number 2; these are the light fuel molecules. Finally, assign the right side of the curve the number 16 for the heavier long-chain molecules. When you add the Fitch Fuel Catalyst this is what happens. The 2s begin attaching themselves to each other to create as many 8s as possible and the 16s begin splitting up into as many 8s as possible. Now you have the greatest number of 8s (most combustible fuel molecules) and the least amount of 2s and 16s.

The end result; the most efficient burning fuel leading to greater horsepower and torque, improved mpg, lower emissions and reduced carbon build up and an all around better running machine.

Conflicts? They don't remove water from fuel. They work with any fuel additive, including liquid stabilizer, unless it contains some metal additive (rare). We don't like them bouncing around in gas tanks of some



equipment, so we put them in the storage can that the gas passes through before being added to the tank. Every plastic Gerry can we own now has one.

A number of recreational vehicle dealers now sell the Fitch Fuel Catalyst because they've also seen first hand the reduction in fuel-related issues. This is especially true in the lawn & garden and industrial applications. Ask for them at your local dealer, or order them from one of the many dealers and distributors that carry them. While they may seem expensive at first (around \$50 for a set of two to treat a sled, we use one cage in all smaller tanks), they're good for at least five years. Say "goodbye" to most fuel related problems once and for all. For even more detailed explanations on fuel and how the FFC works, visit www.fitchfuelcatalyst.com.

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