

# ECO-FUEL IONIZER

## Ultimate Solution for ENVIRONMENT & CARBON MARKET

1. GENERATE MORE POWER
2. SAVE FUEL: up to 15% (On average 10%).
3. REDUCE EMISSION AND GASEOUS POLLUTANTS: CO, HC, NO<sub>x</sub> by 60-80%.
4. REDUCE MAINTENANCE:
  - A) ELIMINATES THE CARBONIZATION OF THE ENGINE
  - B) SMOOTHS ENGINE OPERATION
  - C) IMPROVES COLD STARTING
  - D) DECREASES THE WORKING TEMPERATURE
  - E) REDUCES CLEANING NOZZLES
  - F) CLEAN WHOLE COMBUSTION SYSTEM
  - G) PROTECT THE CATALYST



### BASICS OF IONIZATION

Ion is an atom or molecule (electrically charged chemical species) that can be classified as anions, cations and negatively charged, positively charged, and the anions are attracted by anodes and cathodes by cations.

In chemistry, an ion is an atom molecule that has gained or lost electrons in a process known as ionization. In physics, atomic nuclei from completely ionized atoms as the alpha radiation, are usually designated as charged particles.

The ionization is usually achieved by application of high energize to atoms by applying a high voltage electric, or high energy radiation. An ionized gas called plasma.

The first theorist was Michel Faraday in 1830. In 1884 the phenomenon was described by August Arthenius Srante in his doctoral thesis at Uppsala University. At the beginning was not accepted and his thesis was approved with the lowest note, but won the Nobel Prize in chemistry in 1903 by the same description, finally recognized by the scientific community.

The ionization is not constant, is affected very sensitive by chemistry, geometry, local temperature and friction and motion.

So, bringing the concepts of ionization to the combustion process resulting in carbon dioxide and water, depending on the fuel quality or his composed changes the result.

The ionization process of fuel has been the subject of various theoretical studies and experiments aimed at the optimization of the process of use of liquid and gaseous fuels for the generation of motive force, in internal combustion engines.



For example, the concept of fuel ionization was applied by the **National Aeronautics and Space Administration (NASA)** to ionize the hydrogen used in rockets, in order to improve the power and the better use of fuel. The company American General Motors (GM) has developed a vehicular fuel ionizer based on magnets and endowed with highly complex and there are other types of static ionizers of fuels using natural ceramic magnets, and other sources of monopolar magnetic force.

Fundamentally, the ionization is that fuel the fuel atoms have positive electric charges, by action of protons from the atomic nuclei, and negative by action of electrons orbiting around the cores themselves.

The resonance frequency of the ionizer, of any kind, interferes with the electrons which are around of fuel, forcing the atoms molecules clusters grow and decompose into simple molecules by attracting more electrons, thus increasing the exposure of fuel molecules to oxygen around it, which provides a more efficient and complete combustion.

Fuel quality is poor due to the lack of adequate procedures and structure of the refineries, stations, transporters, distributors, not counting fraud.

Thus, the ionization of the fuel is a very effective process to provide quality in the process of combustion of these fuels, even poor quality, at the same time that contributes significantly to the economy and environmental protection by reducing the emission of pollutants. The gauze as CO (carbon monoxide) and HC (hydrocarbons) are highly detrimental to human health and the environment.

The benefits are obvious, because polarized fuel molecules help to dissolve the carbon and varnish in Carburators, injectors and combustion chamber, resulting in absence of carbonization of the entire system for a much longer time.

The positive electrical charge of C<sub>8</sub>H<sub>18</sub> and diesel gasoline is C<sub>7</sub>H<sub>17</sub>. Already the complete burning a fuel emits CO<sub>2</sub> + H<sub>2</sub>O + N<sub>2</sub>. As well, a rich mixture (more fuel and less air) emits CO<sub>2</sub> + CO + HC + H<sub>2</sub>O + N<sub>2</sub>, while a lean mixture (less fuel and more air) emits CO<sub>2</sub> + H<sub>2</sub>O + NO + NO<sub>2</sub> + NO<sub>3</sub>.

The ionization does not reduce the emission of CO<sub>2</sub>, which is the result of any combustion, but helps to decrease the volume generated, by fuel economy around 10% and reduce emissions of harmful gases (CO and HC) of 20% to 80%, primarily in vehicles that have high HC emission that is reality in older vehicles in proportion.

The new models that have improved technology (some national models manufactured and imported in 2011 onwards) that emit the least amount of HC, the result is very little because the opportunity is less reduction in the same proportion.

Thus, we can conclude that the fuel ionization increases and improves the result of combustion through the complete burning of HC (unburned fuel), taking advantage of better energy potential.

