

DNI NANO FORMULA ONE

NANO FAR INFRARED FUEL SAVER

Compiled by: Khairul Anwar Hanafiah, Skudai, Johor. MALAYSIA.

[This article is highly technical contents. For those who are not on technical background, just read for additional knowledge Why? How? The technology gone through]

NANO TECHNOLOGY

Nano technology is defined as the creation of functional systems on a molecular scale. An alternate definition is based on making things from the bottom up. These systems may be motors, robot arms, and even entire computers that are smaller than a single cell. These small mechanisms must be constructed by the strategic placement of atoms or small clusters of atoms. Nano technology has already been incorporated into the creation of strong materials, stain repellant solutions, optic cables, powerful microscopes, and is currently being introduced to the data storage arena and automotive sector.

While the strong materials and stain repellant solutions are very interesting and useful, the technological uses are much more important. The optic cables are created with nanotech crystals which results in a much better optical resolution than regular cables. These nanotech cables also lead to faster transmission speeds and greater transmission capacities. The smaller components within these cables also require less power consumption, which makes them more earth friendly.

Most fiber optic cables on the market have not been created with nano technology yet. Fiber optic cables already create one of the best resolutions in the market, but creating electro-optic modulators on a nanoscale will produce unbelievable results. Electro-optic modulators are used in fiber optic cables to manipulate a beam of light to carry data from one point to another. With the creation of nanometer sized modulators, each fiber optic cable has billions of these wonderful machines. This increase in quantity automatically increases the speed and efficiency of data transmission. Along with the optic cables, nano technology also has a huge impact on new forms of microscopy.

For years, we as humans have had a desire to break down objects into the absolute smallest particles that exist. We have driven microscopy down as much as possible and now are focusing on nano technology to get more in-depth information. With the assistance of nanobots and other nano-scaled devices, it is possible to see particles smaller than ever before. These microscopes actually allow you to see on the molecular level.

Since we know that nano-scaled machines can actually let you see molecular units, it is

easy to believe that these same machines can actually write to a hard drive on the same scale. All data that is written to any type of storage device is written by a laser, so making the laser writing smaller is the perfect way to get more out of the space you already have. This form of data transcription will allow for the successful storage of unheard of amounts of data in extremely small spaces. This will allow you to store more data on hard drives, flash drives and even on CDs and DVDs.

Nano technology is one of the largest new sciences being studied. These new, miniscale devices will no doubt change many of our day to day processes forever. We will be able to view better images on our televisions, discover smaller atomic particles than ever before, and even improve technological storage capacities. Nano technology is the science of the present and the science of the future. There is no limit to the applications of this science in healthcare, technology or any other area of life. These nano-scaled devices are sure to be used in applications every day and may even be responsible for finding cures for many diseases.

NANO TECHNOLOGY IN DAILY LIFE

In general we are not aware of issues that confront us about science, technology and others super complicated specialized fields. The finished product is normally the result of perhaps many years of study, field-laboratory observation and research. Gadgets we religiously use such as digital music players, cameras, mobile phones have not just materialized.

In the case of the Nano technology there is a small but powerful empire of scientist focused on the study of a world microscopically dimensioned. Nano technology is a multi-disciplinary field of technology and applied science that is solving problems through the knowledge and application of one or more natural scientific fields.

The scale which embraces the Nano technology field is the realm of nanostructures and atoms. There are currently some discussions between scientists and experts about the real measurable range or scale of the Nano technology. Of what we are completely sure is we can not see it with our human eye but when we talk about nanostructures we commonly refer to a range between is 1 to 100 nanometers.

How can we really appreciate and understand that? Surely we need be more aware about the units of measures involved. For example: a centimeter corresponds to 100 of a meter, a millimeter corresponds to 1000 of a meter and a micrometer corresponds to 1 million of a meter. All of these measures are visibly-huge-enormous compared to the 'nano-scale'. According to the reputable Berkley Lab, a nanometer (nm) is one-billion of a meter. Of course that is completely invisible, smaller than the wavelength of the visible light a 100.000 the width of the human hair.

If we compare the nano-scale (that is the scale used for the nanostructures) and the atomic scales, we have that an atom has a diameter near to 0.1 nm and the nucleus of an atom is

evidently so much smaller about 0.00001 nm. All matter in the universe and all is around us is made up of atoms. All inside and outside us is matter and our human bodies are formed from millions of living cells. Though the living cells work like natural nano-machines and in the atomic scale the elements are in a very basic level but in the nano-scale we can join these atoms and make almost everything.

With all this information now we are more conscious about the subject. For some scientist, the Nano-science is a very new science but for others it is just an extension of sciences that currently exists into the nano-scale or just a newer-modern-used-term. How can Nano technology help us in our daily life? For the commoner, the fields of science seem sometimes so theoretical, but there are many applications today that are linked to Nano technology. Scientist using nanostructures can reproduce things like gem stones, food and much more by self-replication nano-robots.

A very important field for this new science is health. Nanorobots or Nanomachines which are devices ranging in size from 0.1 to 10 micrometers can be used in medical technology to detect, analyze and identify through nano-sensors cancer cells to then destroy them. They can also help to identify an early diagnosis for cancer. Nano technology in the environment can be used to detect and measure the concentration of toxic elements more efficiently.

There are a wide range of applications and uses for Nano technology. In the case of food it is used to develop packaging more safely through a nanocomposite which can increase or decrease gas permeability, heat resistance. In the household for example, nano technology applications are already responsible for developing devices for self-cleaning windows, dishes, ceramics etc.

Many people experience eye irritation caused by the ultraviolet rays. Thanks to Nano technology, advances have been made to produce the first anti-reflective ultrathin polymer sunglasses. In optical surgery, nano-optics increase the precision of pupil repair and other type of surgery using laser technology.

Unquestionably we are now receiving the benefits of the Nano technology in many ways. We can improve our knowledge of nano technology according to our self interest. In our daily life there are many things we cannot see and touch which are incredibly powerful and extremely significant for the modern world we live today. **Nano technology is clearly going to play a major role in the future development of many disciplines**

FIR SCIENCE & TECHNOLOGY FOR FUEL SAVER

What is Infrared Radiation?

The light we see with our eyes is really a very small portion of what is called the "Electromagnetic Spectrum." The Electromagnetic Spectrum includes all types of radiation - from the X-rays used at hospitals, to radio waves used for communication, and

even the microwaves you cook food with.

Radiation in the Electromagnetic Spectrum is often categorized by wavelength. Short wavelength radiation is of the highest energy and can be very dangerous - Gamma, X-rays and ultraviolet are examples of short wavelength radiation. Longer wavelength radiation is of lower energy and is usually less harmful - examples include radio, microwaves and infrared. A rainbow shows the optical (visible) part of the Electromagnetic Spectrum and infrared (if you could see it) would be located just beyond the red side of the rainbow.

Infrared spectrum spans from 0.83 μm to 1,000 μm , while wavelengths of the familiar visible lights are between 0.4 and 0.7 μm . Depending on which textbooks to follow, IR spectrum may be further divided into three convenient zones. For example, they are **near-infrared** at 0.83 – 2.0 μm wavelengths, **medium-infrared** at 2.0 – 4.0 μm , and **far-infrared** at 4 – 1000 μm [Ref 1]. However, some references may use 0.8 – 3.0 μm as near-IR and 3 – 1,000 μm as far-IR, while NASA designates 3 – 25 μm to be **mid-IR**. There is no set rule for the divisions. In the IR-fuel Excitation technology, we will use a wavelength band 3 – 14 μm , which fall mostly into the **far-infrared (FIR)** zone, according to the quoted reference.

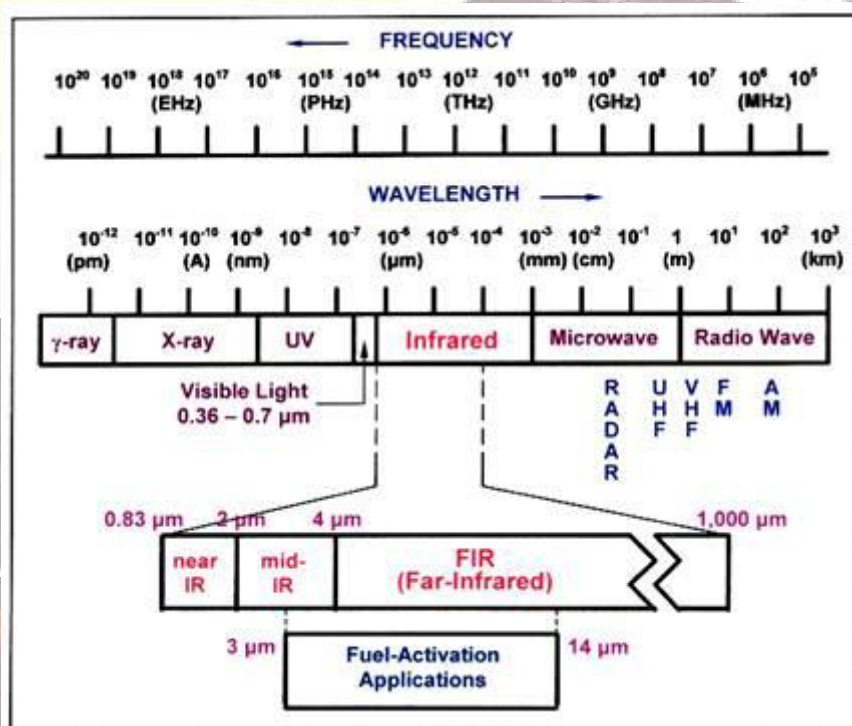


Fig. 1: Frequency and Wavelength of IR

HOW HC MOLECULES ARE IR-ACTIVE

In Organic Chemistry, hydrocarbon (HC) molecules are known to be **infrared-active** and can absorb multiple IR-photons causing molecular vibrations.

The bond in a molecule produces an equilibrium separation between the atoms. About this equilibrium separation, a molecule can vibrate. The vibrational states are quantized. **Excitation of vibrational modes in a molecule requires a photon with wavelength typically shorter than 20 μ .** In addition, excitation of a single mode of a molecule (so-called "*fundamental*") is in general much more intense than excitation of multiple modes ("*combination*" or "*overtone*" bands). Finally, a handle is also required. In this case, the critical issue is whether upon excitation of a mode, the *dipole moment* changes, $\Delta p \neq 0$. In Organic Chemistry, hydrocarbons are known to be "IR-active". In hydrocarbons each bond may simultaneously absorb multiple IR photons at certain frequencies to induce stretching and/or bending vibrations. Only vibrations that cause a change in dipole moment give rise to an absorption band on the IR spectrum (scanned between 2 μ m and 16 μ m), in which the larger the change in dipole moment the stronger the absorption peak.

Organic chemists have been using the IR absorption spectral information, so-called *Infrared Correlation Charts*, to identify functional groups of HC's in unknown specimens for decades. However, none of domestic industry or commercial sectors has been able to realize or test out the full potential of this innovative IR Fuel technology that leverages on the "IR-active" nature of hydrocarbons.

We are proud that IR-fuel excitation effect along with its applications. Based on this discovery, the invention of the IR fuel saving technology that applies infrared excitation, and it works!!!!

HOW IT REDUCES FUEL CONSUMPTION

The FIR-excited fuel can improve engine combustion efficiency and results in increasing power and reducing specific fuel consumption of an engine.

Electrons in HC-bonds can absorb multiple IR photons to climb up "*the ladder of vibrational states*" that results in increased kinetic energy and lowered *activation barrier* of the bond. It means that the chemical bonds of such FIR-excited HC molecules become "dynamic" and will require less energy to break up. Compared to a regular HC, FIR-excited HC has relatively "weaker" bonds in between C and H (*C-H bond*) and C and C atoms (*C-C*, *C=C*, *C=C*) so that the molecular structure can be rapidly shattered and the molecule fragmented into finer intermediate radicals in the collision process of combustion at elevating temperature.

Subsequently, these fine radicals can mix well with oxygen in the air and burn off more instantaneously and completely. This helps the fuel release heat at close to TDC (top dead center), thus contributing more heat to work for higher cycle efficiency. In other words, faster combustion enables getting closer to the ideal of constant-volume combustion. For the same reason, less heat will be released at the later cycle to raise exhaust gas temperature (EGT).

The key factor in the successful discovery of this innovative IR Fuel Excitation

technology is the development of a practical, easy-to-implement broadband IR-emitter at 3 – 14 μm wavelengths.

HOW IT REDUCES ALL GASEOUS EMISSIONS

The FIR-excited fuel can improve engine combustion efficiency and results in reducing all gaseous emissions of CO_2 , CO, HC and NO_x of an engine.

IR-excited fuel-air mixture is combusted close to the TDC and less is burnt later in the cycle so that the amount of unburnt HC or CO leaving the cylinders will be reduced. CO_2 is decreased too, because of less fuel being burnt. While it may sound counter-intuitive, there is a potential to reduce NO_x emission as well. During combustion, not only a portion of the heat released from the fuel is absorbed for fragmenting HC molecules into finer radicals, but also now there are higher numbers of moles of free radicals to share the heat absorption, which helps lower the peak temperatures in the cylinders, to which NO_x emission is directly related.

HOW IT REDUCES SMOKE IN DIESEL ENGINES

The FIR-excited fuel can improve engine combustion efficiency so that it can reduce smoke (soot) generation in diesel engines. Benefit of using FIR-excited fuel in diesel applications is reduced smoke (or soot).

In a diesel engine, soot is created by thermal cracking of long-chain HC's at extreme oxygen deficiency. During diffusion combustion, a separation of hydrogen leads to formation of well-built carbon-rich structures. These active, lack-of-hydrogen carbon-rich radicals may attach to each other and thus agglomerate to form pure carbons. There is some evidence that the particles of carbons that initially form in the combustion have the form of spherical coils of chicken wire consisting up to thousands of carbon atoms. These carbons are subsequently crystallized at high temperature and become difficult to oxidize at post combustion stage.

For that reason, breakdown of HC's into finer radicals can prevent carbon radicals from attaching to each other and forming large clusters. Smaller carbon particles will have a better chance to burn off in the cylinders, which leads to less carbon particles in the tailpipe. Thus, the IR-Fuel Excitation technology can enhance the diesel aftertreatment system such as DPF (diesel particulate filter) performance by lessening the carbon loading rate on DPF so that it may require less frequent regeneration

PERMANENT IR-EMITTER

After eight years of intense research, a "**permanent IR-emitting**" composition that can be made from selective **transition metal oxides** by sintering the mixture of these powders and bonding agents at above 1300°C . The transition metal oxides have such a unique property that its constituent electrons can be thermally agitated to reach a neighboring higher

energy orbit (level). When the excited electron returns to its initial level, it emits an IR photon.

Complying with the principle of *Quantum Mechanics* and the *first law of Thermodynamics*, this engineered ceramic material can continuously absorb radiation heat, mostly in “near-IR” (i.e. $< 2\ \mu\text{m}$ wavelength) from the environment, and re-emit IR photons at $3 - 14\ \mu\text{m}$ wavelengths to maintain thermal equilibrium.

Therefore, it doesn't require additional energy source and the IR radiations last indefinitely. It means a one-time installation and free of maintenance.

HOW IT WORKS: (A TRULY INVISIBLE STORY)

After installing DNI NANO FORMULA ONE you may immediately start noticing smoother idle, better acceleration and less fuel consumption. Then, you may be wondering: "WOW, how did it do that?!"

It's truly an "invisible" story that starts as soon as you place sticker of ceramic module on the fuel hose of your vehicle

The NC-104 module, a proprietary [FIR-emitting ceramic](#) composite, made of transition metal oxides including CoO and Zr_2O_3 , absorbs radiation heat from the environment to emit IR photons in $3 - 14\ \mu\text{m}$ wavelengths. (Yes, don't worry, there is always radiation heat, even in cold, as long as the air temperature is above *Absolute Zero*, or $-273\ ^\circ\text{C}$. However, after the engine warms up, it will radiate more heat.)

At the meantime, the IR photons emitted from FIR ceramic are absorbed by rubber/plastic fuel hose underneath. The fuel hose continues absorbing IR photons until it saturates and can't take any more. It then passes IR photons through and becomes "transparent" to IR. To be more specific from a Quantum Mechanic view, after being saturated, whenever the material takes in an IR photon, it will simultaneously give away (emit) an IR-photon to maintain thermal equilibrium. This is the reason why it requires break-in time after installing the device in order to fully saturate the fuel hose with IR. Also, after removing the device from fuel hose, it also requires time to completely wash off residual IR from the hose before the vehicle returns to its manufacture-set performance.

Subsequently, the hydrocarbon (HC) molecules in the fuel flowing through the hose are exposed to penetrating IR photons and excited, causing bond-stretching and bending vibrations. (According to Organic Chemistry, [HC molecule is IR-active](#) and can [absorb multiple IR photons](#) to cause [molecular vibrations](#).) The bonds of IR-excited HC molecule have higher vibrational energy and thus lowered *activation barrier* (a Quantum Mechanic term). It means that the chemical bonds of such IR-excited HC molecules become "dynamic" and require less energy to break up. The molecular structure can be rapidly shattered and the molecule fragmented into finer intermediate *radicals* in the collision process of combustion at elevating temperature.

These fine radicals can mix well with oxygen and burn off more instantaneously and completely in cylinders. This helps the fuel release heat at close to TDC (top dead center), thus contributing more heat to work for higher cycle efficiency. In other words, faster combustion enables getting closer to the ideal of constant-volume combustion and results in higher indicated work and hence more output torque and power.

The use of IR-excited fuel minimizes the cause of engine knock so that the engine may operate right before the pre-programmed (mapping) pre-ignition limit. Experience confirms that such system allows optimal spark timing, which coincides with considerable improvement in both fuel economy and torque. Since IR-excited fuel can burn faster and more evenly, it may mitigate pre-ignition problem and stretch pre-ignition limit, allowing significant *Timing Advance* that improves engine performance.

Now, you know that's why you have noticed increased power and gas mileage after you installed FIR device. You can feel the results even if FIR is invisible!

NANO FUEL SAVER (DNI NANO FORMULA ONE)

Nano Fuel Saver uses both the latest nanotechnology and the principle of FIR to make your driving experience extraordinary. After installation, it absorbs the heat energy from engine to lead out FIR thermal energy to minify fuel's molecules, purify impurities contained in the fuel, advance atomization effect, enhance complete combustion, increase horsepower and torque, improve fuel economy, reduce engine vibration, faster acceleration, cut down fuel consumption, reduce engine carbon build-up, reduce toxic exhaust emissions to diminish air pollution, keep the engine in optimum condition to extend its lifetime, easy installation, no engine refit, and no chemical additive.



Figure 2: NANO FORMULA ONE STICKER

In layman's terms the DNI Nano FORMULA ONE is a STICKER impregnated with nano-particles (contains aluminium ceramic). When this sticker gets heated up, it creates a wave called Far Infrared Ray (FIR). FIR is a part of the invisible light spectrum and it is in between visible light and microwave but not harmful to the human at all. In fact scientists call it the 'light of life'.

This ray has a major effect on the liquid (water, petrol and diesel) and gas by resonating the molecules in high frequency mode (strong vibration) to prevent clustering of the oxygen, hydrogen and hydrocarbons molecules. In the combustion area, high resonance will makes these molecules to be smaller and allows the fuel and air to be mixed more evenly and efficiently before it is delivered into the engine for combustion. The overall result is more complete combustion. The other places where the sticker where apply are on Radiator hose, Air filter hose, Air condition (cold and hot) hose and at power steering pump hose. The concept carried on are to breakup the molecules and make it smaller in order to efficiently absorb and remove heat from the liquid. Therefore the engine running more lighter and smooter.

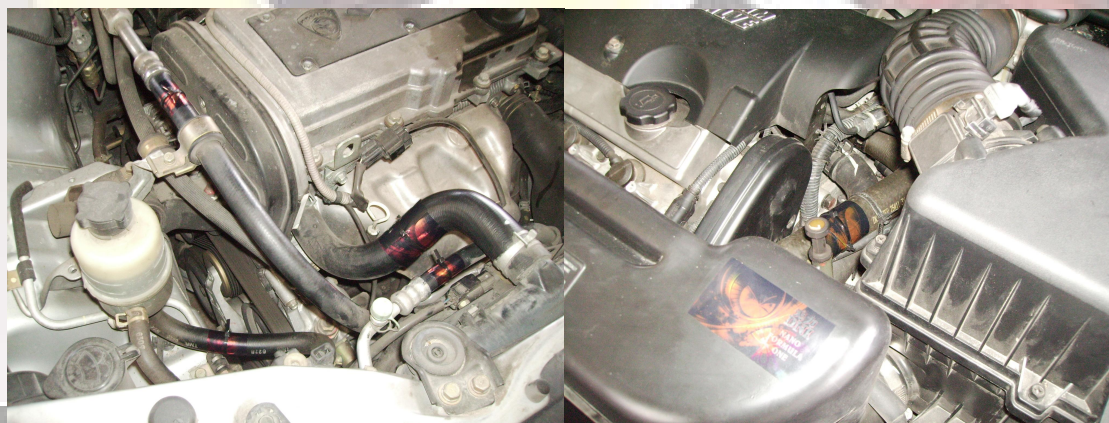


Figure 3: Nano FIR Fuel Saver emitter installed on WAJA 1.6 and NAZARIA 2.5

Suitable for all MALAYSIAN CARS. (Old and New Cars).

Immediate Effects after installations:

1. Noise reduction on engine
2. Low rpm on idle (means less load on engine to operate a numbers on integrated pumps)
- so less fuel usage
3. Timing on radiator fan and air condition compressor become shorter

Effect while driving:

1. Increase power on engine (need less fuel to gain high torque)
2. Engine running more smoother and quiet (reduce noise)

Overall effects:

1. Cleaner engine
2. Less smoke and maintenance

3. Saving fuel (10% - 30 %)

Other effects: INSTALL AND FEEL THE DIFFERENCE

Note: EASY INSTALLATION - WITHOUT ANY MODIFICATION TO ENGINE

PRICE: RM288.00 (for one car) - non member
RM460.00 (2 cars + RM100.00 for registration)

Need more informations please contact:

Khairul Anwar Hanafiah, 013-7738103
(email: khai662002@gmail.com)

How To ORDER:

***Please submit NAME, I/C NUMBER and HAND PHONE NUMBER
(REGISTER FOR MEMBER)

OR

*** NAME and Contact address (mail address)

AND

Pay to: KHAIRUL ANWAR HANAFIAH
CIMB ACCOUNT: 0118-0009092-52-7

2 set + registration + postage = RM 465.00
1 set + postage = RM 293.00

"MONEY BACK GUARENTEE - COOLING PERIOD 10 DAYS"

References:

All informations are compiled from several sources of books, papers, articles and internet.
Keywords: Far infrared radiation, Fuel saver, Nano Technology