Upgrading All Standard Fuels Without Additives!

DIPETANE
INTERNATIONAL

DIPETANE FUEL TECHNOLOGY

Increasing Output
- Decreasing Greenhouse Gases

DIPETANE
AN INDEPENDENT ASSESSMENT BY
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CHARTERED ENGINEER

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An Independent Assessment of

DIPETANE INTERNATIONAL

May 2020

TO WHOM IT MAY CONCERN

I first became aware of ***DIPETANE*** in 1987, shortly after it was introduced to the market and have closely followed its progress and development since then.

As an engineer, I had been brainwashed into thinking that there was a glass ceiling to the maximum efficiency for combustion of hydrocarbons and this glass ceiling was unbreachable. Also due to the "inevitable" waxes and heavy molecules within any bulk load of oil, the theoretical maximum efficiency was unachievable because of sooty particles which represented the very small percentage of the fuel which failed to combust and instead lined the walls of the combustion chamber reducing heat transfer to the heating system, or clogging the injectors or spark plugs.

I watched as ***DIPETANE*** gained what I saw as anecdotal evidence built up in fleets at Coca Cola Ireland and the Irish military. Over the years, more and more convincing evidence built up showing the achievement and maintenance of improvements in mpg, better flue gas results, cleaner boilers and fuel injectors from fleets and boiler applications in Ireland and elsewhere. The evidence developed into a tsunami which could not be ignored.

Then came the report prepared by Chartered Engineer, Alan Logan, BSc MSc MCIBSE MIMarE, who carried out tests in the Research laboratory at the University of Ulster, Department of Building and Environmental Engineering. This research moved the evidence to a new plane. He identified a lowering of the temperature of the flue gasses, hence that the fuel was being burnt at a lower temperature and despite this, the amount of ***DIPETANE*** treated fuel needed to generate 1kWhr of heat was reduced by 10.45%. He referred to this as the Specific Heat of ***DIPETANE*** treated fuel. More remarkably because ***DIPETANE*** pre-treatment eliminated unburned fuel deposits (soot), all the carbon was oxidised and more of the heat transferred into the heating system.

I was sceptical of these findings and consulted some MSc student friends and borrowed their text books on Thermodynamics. This was not much help as the chemical reactions are the same and the heat comes from oxidation of the carbon in the hydrocarbon chains. I then looked at the Hamworthy Boiler manual which explained it in a much more understandable format as follows;

Burning fuel gives off heat when the Carbon chains are broken and Oxygen combines with both the Carbon and Hydrogen atoms, forming CO_2 and H_2O. The source of Oxygen is the 21% contained in free air. Unfortunately the remaining 79% of air is unwanted Nitrogen which comes into the system at room temperature and takes heat from the system to exit at an elevated temperature in the flue. Boiling the water (H_2O) represents another drain on the system as this too escapes as steam at high temperature. If you don't control the intake air and send in too much, all that happens is that more gasses go up the flue stack taking with it more of your heat. If there is insufficient air, the chemical reaction is not as efficient and some of the Oxygen converts to Carbon Monoxide, (CO), which apart from being poisonous, adds to the waste. Therefore if the intake air can be controlled exactly so that

there is only just enough Oxygen, and hence the minimum amount of Nitrogen, the flue gas losses are reduced to their lowest possible.

If this situation can be achieved at lower temperatures the conversion of Nitrogen to Nitrous Oxides is reduced as are the emissions of other oxides which come from impurities in the oil, such as Sulphur. Not only that but the water in the flue, in the form of steam, steals less energy because of the lower temperature.

Then looking at the other side of the equation, if, in burning all of the oil, you eliminate the sooty lining of the boiler plates and walls, the amount of heat which becomes useful increases and transfers into the heating system further reducing the amount of oil needed to heat whatever process is involved.

It's all very well, the theory sounds marvellous. What about the practice?

I looked at the before and after situation in some heavy oil boilers at Minch Norton in Enniscorthy, Co Wexford and Athy, Co Kildare. Whereas before the ***DIPETANE*** treatment was introduced the boilers were operating at what appeared to be relatively high efficiencies with excess Oxygen of around 4% and there were frequent issues with the texture of the incoming oil leading to problems in operation requiring frequent cleaning of the boilers with visible smoke and smut deposits.

Four months after introduction of ***DIPETANE*** treatment to the 200sec fuel oil (Heavy Oil) the boiler had a better Oxygen profile, increased efficiency, the back end temperatures were similar to before despite more oil being burned, reflecting longer air retention times, better heat transfer and better oil flow characteristics. The startling evidence being the pronounced step change in the boiler efficiency, as measured by the client's building management system, from less than 80% to a steady 87% was impressive and confirms the findings of Alan Logan's results in the University of Ulster laboratory.

At the same time ***DIPETANE*** treated fuel was undergoing long term controlled back to back tests in two fleets of heavy articulated trucks in the US. The results from that test show a like-for-like improvement of more than 17% in fuel saving.

By that stage the Irish army had detailed records of over 10,000,000 miles of usage in thousands of diesel and petrol vehicles, ranging from jeeps to tanks and heavy transporters, and can verify 12.3% fuel saving and maintenance cost reductions. Similarly Linfox Transport in Australia had the emissions from their heavy vehicles tested by the internationally renowned Gas Technology Services Ltd and this test showed dramatic improvements in exhaust gasses at low and high revs.

It's not surprising that the many commercial fleets using ***DIPETANE*** are also showing similar improvements, with significant improvements in exhaust fumes as measured in NCT/MOE tests.

The above evidence was reviewed in November 2017 by Dr Stephen Dooley, Assistant Professor of Energy Science at Trinity College Dublin School of Physics. His observation was that "it is beyond any scientific doubt that both historical and modern engine technology/fuel technology partnerships fail to extract even a majority share of the fuel chemical energy available for transport. The basic problem is that the incoming oxygen cannot access the volatile complex carbon chain structures in diesel."

The compelling evidence has built up over 34 years from transport fleets and boilers have shown that with ***DIPETANE*** fuel treatment this problem has been confronted and overcome. In my view after all these years of watching the effects of ***DIPETANE*** fuel treatment it's time to say that the case is proved.

Fergus C Cooney, Chartered Engineer

13th May 2020

Fergus C Cooney Chartered Engineer, BE, MIEI, FCIArb

Some Facts About Dipetane

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In February 2020 **The Guardian** referred to a study by the **Finland based Centre for Research on Energy and Clean Air** which found that fossil fuel pollution is behind 4m premature deaths every year. In April they reported that sharp falls in road traffic and industrial pollution due to the Covid shutdown in Europe led to 11,000 fewer deaths from pollution in the UK and elsewhere in Europe.

The pollution complained of is made up largely from smoke and other emissions from transport and oil fired domestic and industrial boilers. In these emissions are three components which are far worse than they should be, NOx, Sox and particulates, or unburned fuel which comes out as black smoke.

DIPETANE is a blend of refined oils which pre-treat the fuel to dissolve waxes and grease which form in the fuel during storage, particularly at low temperatures. These impurities prevent formation of the very fine spray necessary at the point of combustion so that complete combustion can be achieved. If the oxygen cannot get at the carbon during the split second the fuel is compressed inside the cylinder at the top of the piston stroke black smoke results. Some authorities claim that this black smoke is inevitable, it is not. Why accept that only a percentage of the fuel is burned?

DIPETANE fuel technology was developed to ensure that all the fuel can be burned and therefore all of the energy released. This leads to better mpgs and additional improvements that arise because there are no smoke and no carbon deposits.

Tests in boiler fuel have shown that elimination of the waxes and grease prevents hot spots in the combustion chamber. As a result the temperature of the chamber is reduced with some very beneficial side effects.

The oxygen supply to boilers, being air, is made up of approximately 79% Nitrogen and 21% Oxygen. The Oxygen is the component we want, the Nitrogen is the party crasher from hell because at high temperatures it combines with Oxygen to form Nitrous Oxides (NOx) which when they exit from the flue combine with rain to form Nitric Acid, aka Acid Rain. Similarly with any other impurities in the fuel, such as Sulfur. Oxidation is a function of the temperature of the furnace, lower temperatures mean lower amounts of SOx in the exhaust.

Simply reducing the temperature of combustion by approximately 20 degrees C reduces the amount of Nitrogen & Sulphur conversion meaning cleaner exhaust gasses and more of the energy created becomes useful.

Most importantly the cleaner burning nature of **DIPETANE** treated fuel means that you get full combustion and the full benefit of all of the fuel which is reflected in higher MPG's (or lower Lt/100Km). Whatever way you say is it, it saves money and the air tastes better.

DIPETANE technology is Irish owned and developed. It has an impeccable record over 34 years. It's time to adopt it to address the ever increasing problems with air pollution and climate change.

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A Chartered Engineer, **Alan Logan BSc**, *MSc, MCIBSE, MIMarE*, from the **Dept of Building and Environmental Engineering at University of Ulster** looked at the energy generated from the fuel and were able to identify that the quantity of fuel needed to generate 1 kWh of energy was reduced from 96.5 grammes to 86.44 grammes, a reduction of 10.45% when of **DIPETANE** treated fuel was introduced into the system.

Their findings in relation to exhaust gasses show a reduction of 15% in emissions of oxides of Sulphur and 7.5% of oxides of Nitrogen.

Commercial use of **DIPETANE** treated fuel over the past 34 years confirm these results, both in transport and boilers. **DIPETANE** is a fully Irish owned and manufactured technology. It's about time we adopted it.

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Oil naturally occurring in the ground is a mixture of heavy hydrocarbons which are distilled in the refinery process into various grades of fuel. As soon as it is put into storage tanks there is a tendency for the oil to revert to its original state and the sludge like deposits gather in the bottom of the tank.

If any of the deposits are disturbed and get into a vehicle or boiler, when they come up for combustion, they either cause hot spots which raise the temperature of combustion and the temperature of the exhaust gasses, or they fail to burn and become sooty deposits on the walls of the combustion chamber or black smoke particles.

Combustion is the chemical process by which Oxygen combines with the Carbon and Hydrogen atoms in the fuel to form CO2 and H2O and give off heat. The higher the temperature of combustion the more conversion of other elements, such as Nitrogen and Sulphur, that occurs. With **DIPETANE** fuel technology it is possible to reduce the temperature of combustion. Tests carried out by the **Alan Logan** *BSc, MSc, MCIBSE, MIMarE, CEng* in the laboratory at **University of Ulster** identified this reduction in the temperature and also reductions in emissions of SOx and NOx by 15% and 7.5% respectively. His even more spectacular finding was that the mount of oil needed to produce one unit of energy was reduced by more than 10%. Combining the increase in heat output and reducing flue gas losses gives a combined improvement approaching 20% in diesel burners.

Over many years **DIPETANE** treated fuel has been showing equally impressive results in transport applications. From reported improvements in fuel economy in many working commercial fleets to a perfect record in flue gas tests carried out by **NCT/DOE**.

DIPETANE fuel treatment now has a 34 year record in reducing harmful emissions, better performing boilers and engines and fuel savings for those who can measure it. It's time that it was used more widely to assist in meeting the climate change challenge.

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Dipetane Fuel Treatment contains ZERO additives

Dipetane's ***More Complete*** combustion helps to -

- Save up to 10% on all fuel usage
- Reduce NOx by 30%, CO2 by 15% and Smoke by 50%
- Pass NCT/MOT/DOE smoke tests easily
- Keep diesel particle filters clean and extend catalytic converter life
- Keep air intake valves clean when using EGR
- Compensate for the recent 90% reduction in sulphur, helping protect injectors, valves, pumps & exhausts
- Compensates for the new addition of 4 to 7% of Bio-Diesel in fuels by burning the carbon more completely
- Dipetane helps to prevent waxing in diesel to -34C(pour point)
- Eliminates the need for 99% of outdated additives in diesel, petrol & heating oil
- More than compensates for the added cost of ADBLUE/NOX reducing additives
- Enhances the actions of all biocides helping to prevent bacteria growth
- All Dipetane claims are based on extensive field trials over 30 years

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