DPF FILTER REGENERATION (soot traps)

Soot traps (particulate or soot traps) are essentially the so-called DPF filters, which hold the soot particles and then oxidize them. These traps are placed in the flue gas pipe through which the hot flue gas passes. The technology of soot traps in diesel engines presents some practical problems, the main ones of which are listed below: -

The main problem is their placement in the exhaust pipe which increases the outlet pressure, since it is essentially a barrier to the passage of exhaust gases. Therefore, for the smooth flow of the exhaust gases, an increased back pressure from the engine is required. This is because from one point onwards the amount of particles collected in the filter is so large (trap load) that it blocks the passage of exhaust gases into the atmosphere, impeding their flow. This reduces the power generated by the engine, the lack of which to compensate requires an additional supply of fuel to the engine (load increase).

Under normal Diesel engine operating conditions, trapped soot particles cannot get oxidized and ignite.

For this reason, an important process for the operation of the trap (DPF filter) is the regeneration which is the burning of the trapped soot particles.

This can be achieved by raising the temperature at the point of ignition of the soot for as long as the air-rich exhaust gases are present. The soot particles ignite at a temperature of about 600 – 650°C, which is higher than the normal exhaust temperatures of Diesel engines (360°C – 400°C).

There are 3 ways to solve this problem:

1. PASSIVE REGENERATION takes place (with continuous motion on the highway).
2. CATALYTIC ACTIVE REGENERATION to achieve ignition and combustion at a temperature much lower than 600°C should be used suitable active, catalytic liquid that has the ability to lower the ignition point and combustion. The liquid is either sprayed through a special KIT or added directly into the fuel.
3. CATALYTIC FORCED REGENERATION where the catalyst liquid must either be pouredinto the porous coating of the trap, or poured as an additive into the fuel, thereby reducing the ignition temperature of the particles. This is done with an electronic program of spraying in specialized workshops.

HISTORY OF THE DPF

In the early 2000s, European car companies introduced filters to the engines that trap soot particles.

Immediately after the accumulation of soot in the filters, the need to clean the filters became clear due to the problems mentioned at the beginning.

The best way to clean the filters is to burn the soot particles, and remove them from the filter holes.

However, the soot can ignite and evaporate only at a temperature above 600°C.

In normal engine conditions the temperatures generated are much lower in the exhaust area, from about 360°C to 400°C.

Therefore, when the filter is filled with microparticles we could:

1. Replace the filter. (Costly)
2. Disassemble the filter, clean it and then put it back (costly and time consuming)
3. Try to burn the soot and thus self-clean the filter, either by raising the exhaust temperature to 600°C (which is difficult and perhaps dangerous) or to somehow lower the ignition temperature of the soot so that it ignites itself at existing exhaust gas temperatures.

It was necessary to apply chemical knowledge and technology in order to reduce the temperature of ignition of the soot.

The PSA engines first installed a KIT (a special container that could spray a chemical liquid) in a suitable place in the car so that it can apply the liquid to the filter pockets and allow the shoot particles to ignite at temperatures much lower than 600°C. And in fact, this should be done automatically and repeatedly.

The first partners of PSA that tried to manufacture such liquid, relied exclusively on the technology of some organometallic elements such as cerio or ferrocene. These organometals actually lower the flash point of the soot and thus clean the DPF filter. But the fact is that these organometallic elements are quite expensive, and thus the products that use them are expensive too.

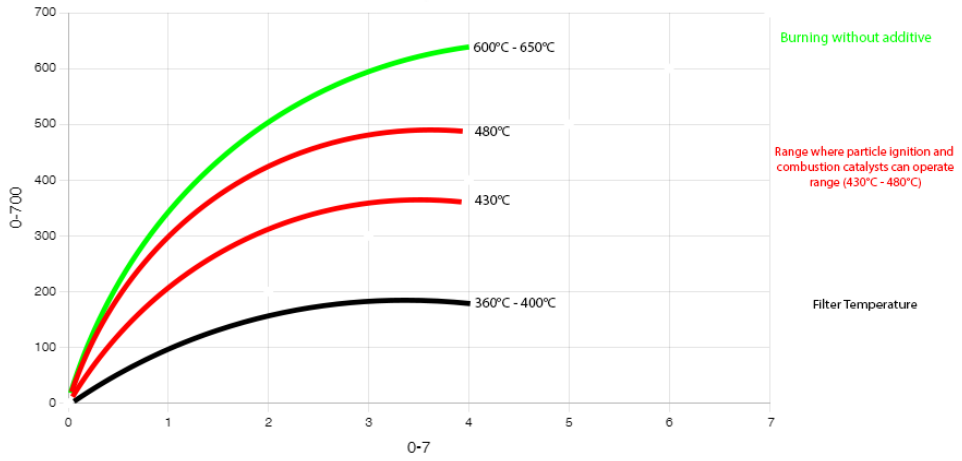
Technology from the year 2000 and onwards advanced rapidly, and so products were created that provide the exact same results, or even better. That is, they lower the ignition temperature of the soot particles in the microparticles immersed in it, and thus they burn, freeing the folicles of the DPF filters.

In summary, it is worth mentioning that:

The particles ignite between 600°C and 650°C.

The normal filter temperature is 360°C – 400°C.

With catalytic regeneration (through spraying) either with the old technology or with the new one, it achieves particle combustion at approximately 430°C – 480°C.



CHECK DPF LIGHTS.

The most reliable witness of the quality of the chemical material used, is the check DPF light on the car dial.

The engines now have a special sensor that is activated when the accumulation of soot microparticles inside the filter blocks the passage of the exhaust. The sensor then activates the DPF lamp on the dial and notifies the driver that the filter must undergo catalytic regeneration.

Car status falls either automatically (in active) or for workshop (in forced) regeneration mode. Within a few minutes (usually 10 - 15 depending on the intensity of the accumulation), from when the regeneration begins, and as soon as the microparticles are ignited and burned, then the sensor detects the cleaning and commands to turn off the light on the dial, which means that the filter has been thoroughly cleaned and is ready for restart.

It is worth noting here that the time it takes for chemicals using old or new technology to be about the same, to turn off the light.

DPF cleaner VOULIS CHEMICALS S.A

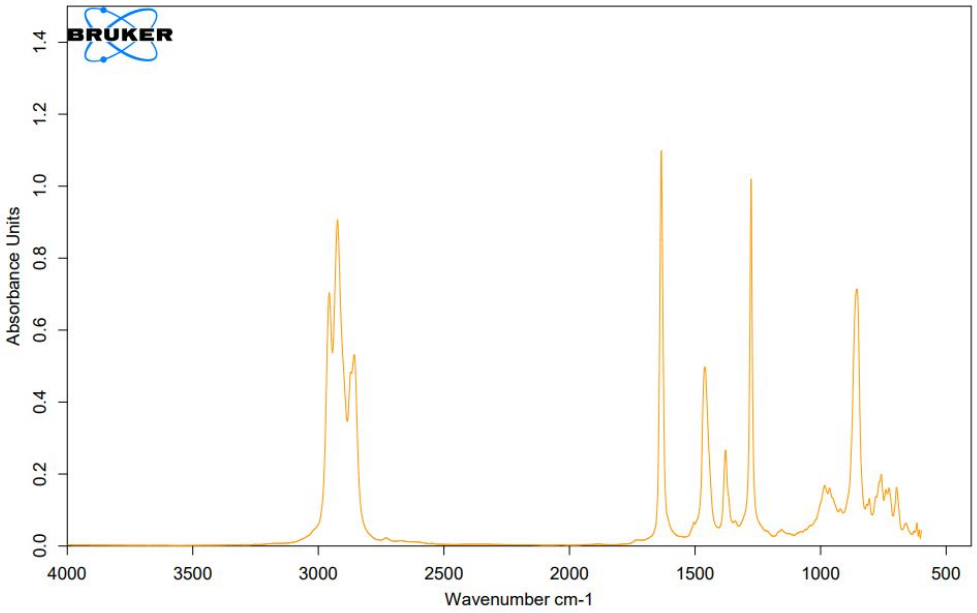
VOULIS CHEMICALS S.A, following every development in technology, and with 40 years of experience in the field, for more than 15 years, manufactures this product with technology that fully meets its mission, while being fully compatible with all previous technologies. It circulates freely, safely and legally in the market. with the European UFI number 17K0-J0NM-100J-2DQP

The technology we follow refers to a cocktail of organometallics and many other elements, which allow the ignition of microparticles at a lower temperature. Existing concentrations and handling are extremely simple and are described in detail on the product label.

And let's not forget… the most indisputable witness of the quality of the material is only the check DPF light on the dash.

Did it go out? The work was done… because that's why it was designed.

VOULIS DPF cleaner SPECTRUM



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