

FilterMaster DPF

Cleaning of Diesel Particulate Filters



NO CUTTING REQUIRED

RESOURCE-SAVING

ENVIRONMENTALLY-FRIENDLY

COST-EFFICIENT

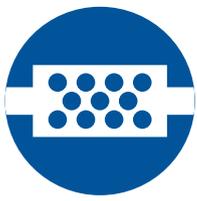
Cooperation partner in Germany:

mycon GmbH



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DPF Cleaning FilterMaster for cars

The service life of a diesel particulate filter (DPF) depends to a large extent on the fact, if the vehicle has been used on short or long distances. On short distances in the long run the system does not reach temperatures, which would result in an optimum combustion of the residues.

Cleaning will be necessary if the counter-pressure in the filter increases. This will be displayed by the system. Then, the motor could lose performance and switch over to the emergency operating function.

Cleaning without any



Passenger cars



Vans

In addition to the flawless cleaning effect, the advantage of the cleaning system FilterMaster for cars is that the complex exhaust system does not need to be separated for cleaning. The filter areas need to be exposed for cleaning with traditional systems. To do this, the housing needs to be separated – in most cases on both sides. The housing is mostly separated through a simple parting-off grinder. The parts need to be re-welded after the filter cleaning. The customer has no control over the quality of the welding. Since the welds would corrode due to the discoloration caused by the heat, the housing needs to be treated with aggressive blasting abrasive to remove this discoloration.

With the procedure FilterMaster for cars, the quality of the housing will be maintained to its full extent.



No cutting required
No welding required.
The disadvantages
of conventional
cleaning procedures
do not apply!



Destroyed built-in filter after having used workshop chemicals

Cleaning with a steam jet is not recommended at all. The cleaning is incomplete, there is also the risk **that the filter will be damaged**. Moreover, the waste water / workshop chemistry must in no event enter the sewage system, but has to be disposed of separately. Cleaning with a steam jet or workshop chemistry is therefore not recommended, not just from an **industrial safety perspective**. With regard to **disposal costs** and potential damage to the filter, this type of cleaning is not economical.



- For all vehicles and machines. all types and sizes
- Cleaning within 24 hours
- Scientifically tested cleaning process
- Proof of cleaning about the through-flow behaviour and the removed quantity of soot and ash

cutting required

The cleaning procedure

The cleaning functions with compressed air, to which an aerosol is being added for a short time during the process. It is non-poisonous and even edible, if you can handle the bad taste. Contact with the catalytic surface of the filter produces a chemical reaction which is due to the generation of gas, among other things, expels the remaining dirt particulates from the filter. Then, the filter will be dried at low temperatures. The whole cleaning process is performed fully automated without any human interference.

Particulate filter BMW E60; 5 series

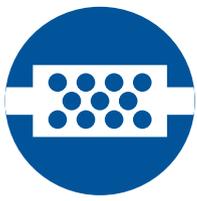


Particulate filter Mazda 6



Particulate filter VW Crafter





DPF Cleaning FilterMaster for trucks and more

With **FilterMaster for trucks and more** already a five-digit number of filters has been cleaned to the customer's fullest satisfaction. It relates to the cleaning of OE installed systems and retrofitted soot filters.

Also, the catalysts designed for a long service life, which are impaired by oil contamination or obstructions, FilterMaster DPF offers efficient cleaning solutions.

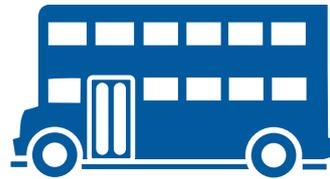
clean, saving resources ...



Vans



Trucks



Buses



Agricultural vehicles

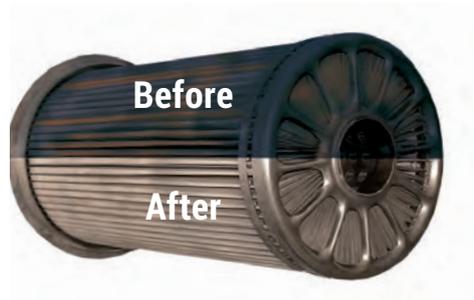
FilterMaster DPF cleans retrofitted soot particulate filters, catalysts or the particulate filters of trucks which were already built-in by the manufacturer. This relates to retrofitted vehicles types in class EURO 2 + 3, EURO 4 (SCR technology) as well as soot filters which are already installed by the manufacturer as per standard EUR 5 + 6.

New agricultural vehicles are mostly equipped ex works with a diesel particulate filter, mainly made of ceramics. Since 2013, the level 4 needs to be applied according to the European Emission Standard III B.

Ceramic filter



Particulate filters made of stainless steel sintered metal



Built-in filter of an agricultural vehicle



Cleaning procedure – CO₂ dry snow

The filter is treated with compressed air, CO₂ dry snow and with additional additives (non-poisonous), if applicable. In the process, ash and soot residue will be embrittled and mechanically separated from the surfaces, shredded and removed from the filter.



Forklift trucks



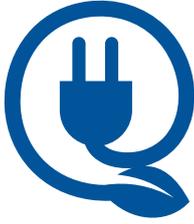
In the field of truck exhaust gas particulate filters and similar filters of any type and size; the basis is the CO₂ technology “FilterMaster for trucks and more” developed by mycon. This technology for the cleaning of diesel particulate filters is being continuously developed. For standard filters in this field, another step to reduce the cleaning times and cleaning costs for maximum cleaning quality is under development. Also, here the way leads to a fully automated cleaning system.

Particulate filter of a forklift truck



Cleaning of a truck filter





Cogeneration plants

Exhaust particulate filters for cogeneration plants reduce the emissions of ash, soot and oil carbon enormously. Maintenance should be carried out after roughly 1,500 – 3,000 operating hours.

FilterMaster DPF offers cleaning solutions for filters made of ceramic or stainless steel sintered metal, which almost reproduce the replacement value of the filter.

Catalysts of a cogeneration plant



Ships

In the EU, restrictions have been imposed on the emissions of ships since 2006. In some cases, soot filters have already been installed in this area. Tighter restrictions are expected to follow.

FilterMaster DPF offers low-cost cleaning for these filters. Partially, the filters can be cleaned even if they have already been built-in. The time saved through this can lead to considerable cost benefits.

Particulate filters of a ship



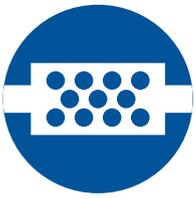
Locomotives

Many locomotives, – mainly those used for local transportation, – are powered by diesel engines. Locomotives are made-to-last assets due to their high purchase price. Many locomotives are therefore equipped with retrofitted soot filters.

FilterMaster DPF offers comprehensive cleaning solutions for these filters. The size of the filter is of secondary importance. Even very large filters are easily adapted to the cleaning process.

Automated cleaning system for large filters





Examination of the cleaning result

demonstrably efficient ...

mycon filter test facility

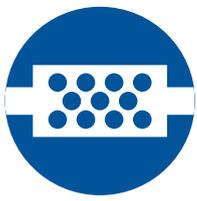
The filter testing facility of the manufacturer mycon serves to measure the through-flow behaviour of exhaust gas particulate filters. The measurement will be performed once before and then after the cleaning. After the cleaning, the through-flow behaviour should almost be equal to that of new filters.

The test facility is suitable to accept exhaust gas filters of a weight of up to about 500kg, an overall length of 200–700 mm and a diameter of 200–700 mm.



DPF cleaning with cleaning proof



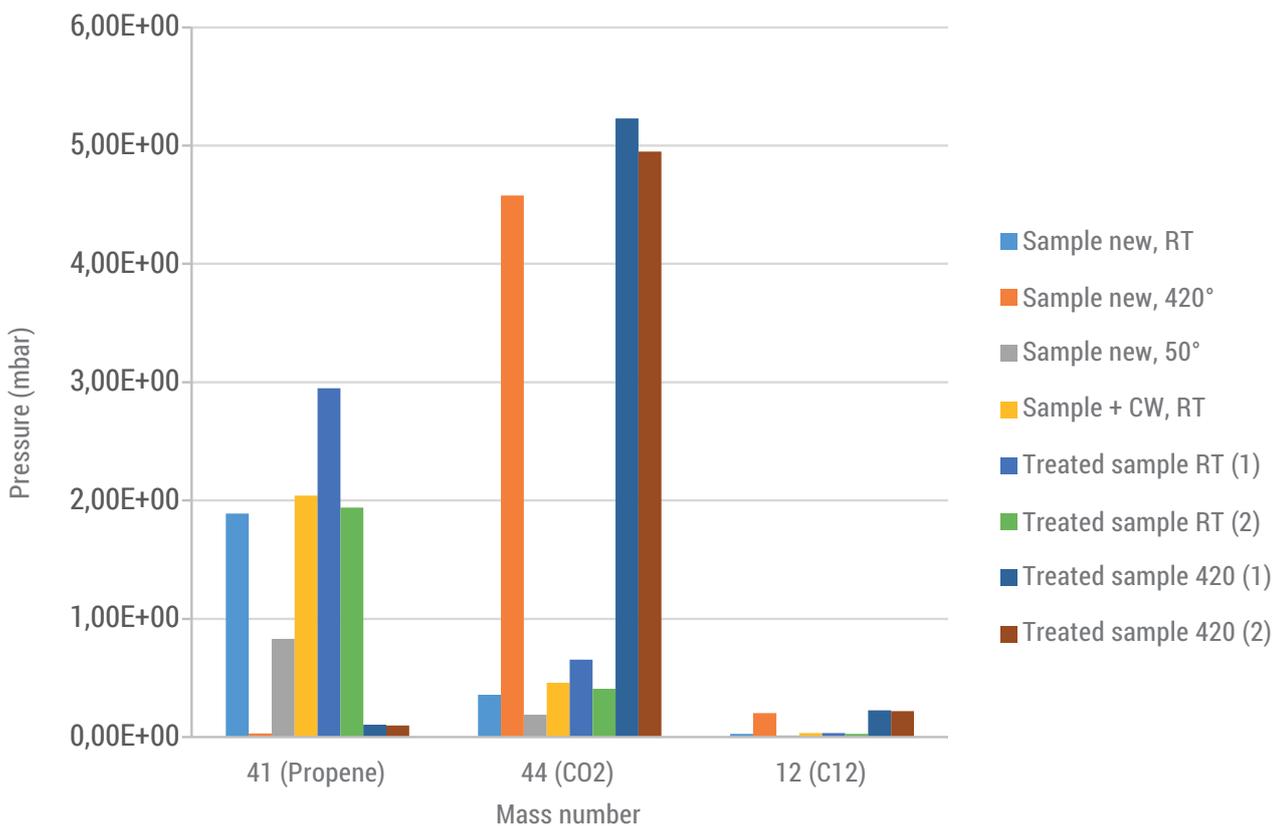


Scientific accompaniment by the University of Paderborn

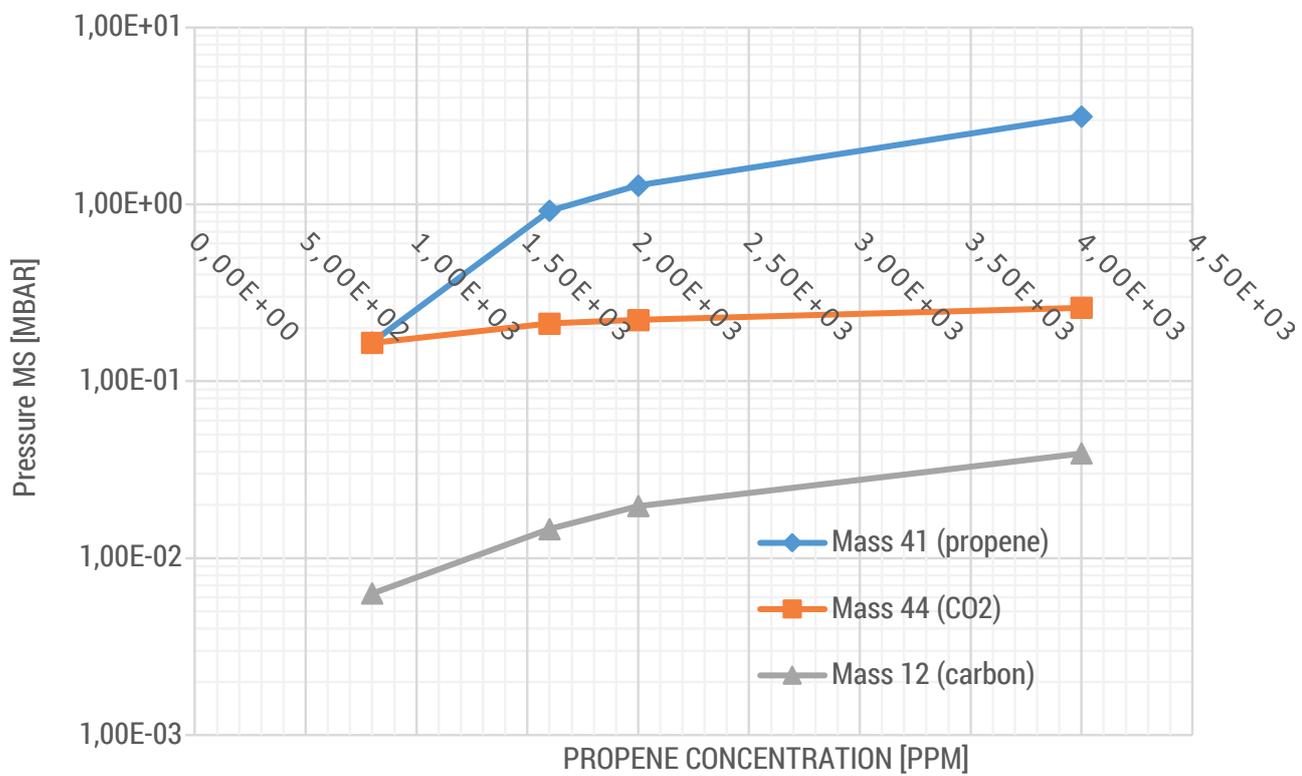
In a test series, the influence of the treatment of a particulate filter (DPF) should be examined with a chemical active component (CW) regarding its ability for the conversion of polypropylene (2000 ppm in synthetic air). To do so, the experiments described below were performed with a part of a DPF described as new were made available to the customer (hereinafter called the sample) and a quantity of the CW also made available. The results suggested that a treatment of the sample with the CW in the frame of the measurement accuracy on the used analytical instruments does not have any influence on the ability to conversion to 2000 ppm of propylene in the synthetic air at an operating temperature of 420 °C at low relative humidity (8 % r.h. at room temperature).

The results of the above described measurements are summarized in the following graphs: Illustration 1 shows the results of the different conversion tests of propylene before and after the treatment of the sample with the CW. It is possible to ascertain that the signal for the characteristic mass of propylene (41) at an operating temperature in the new (orange) as well as in the treated condition (dark blue, brown) of the sample is comparable in the field of the measurement accuracy of the mass spectrometer. In the meanwhile, it is necessary to observe, that the sample is not positive-locking in the stove pipe and thus a slip is to be expected.

@Fliesstest:



Illustr. 1 Summary of the conversion of propylene of the sample in the new state and after the treatment with the CW at room temperature (RT) as well as at the operating temperature of 420 °C.

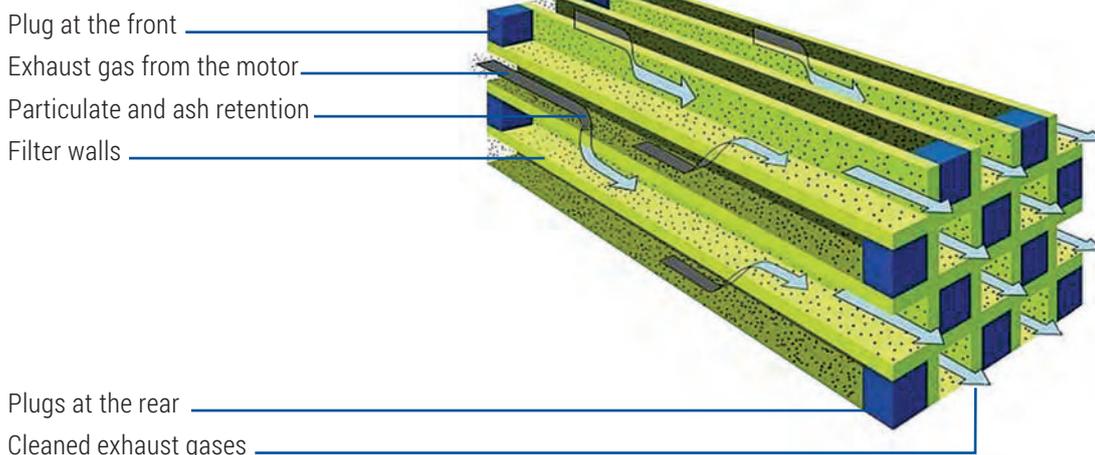


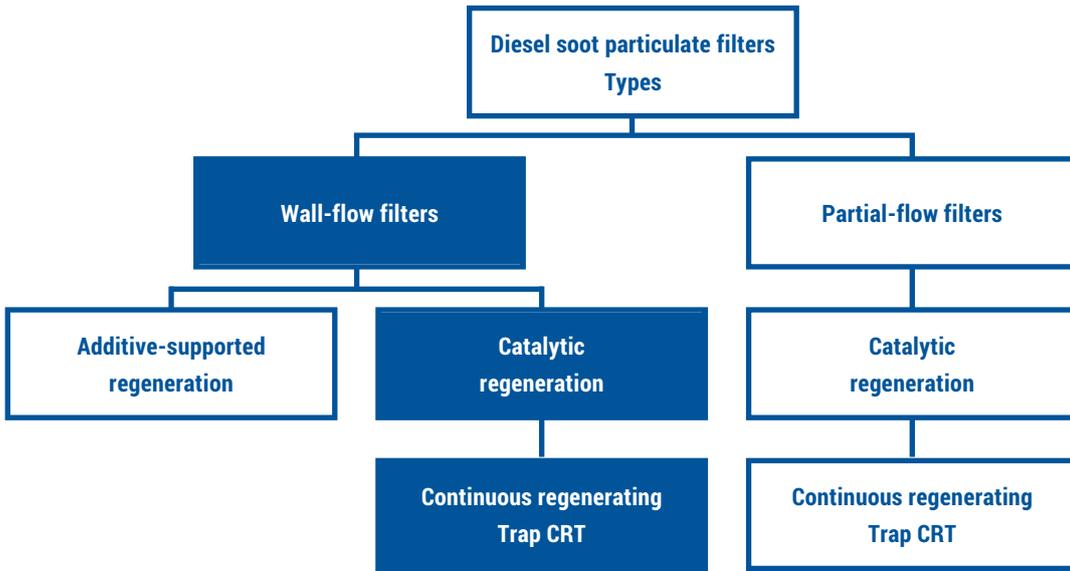
Illustr. 2 Calibration curve for the different provided gases; 200, 400, 800, 1600, 2000 and 4000 ppm propylene were provided; however, it was not possible to prove propylene below 800 ppm.

As an additional indicator for the conversion of the propylene, the characteristic mass for CO₂ (44) was represented as a product for the conversion of the propylene. According to the reduction of the propene signal, the quantity of CO₂ increases considerably at the operating temperature of the sample and in both cases at a comparable level. The same may be observed in the carbon signal (12). The cross-check, i.e. the ability of the propylene conversion for the cold sample, shows that the operating temperature is required for the sufficient catalytic activity of the sample.

Please find further information about the scientific accompaniment of our cleaning process on a video or in a PDF under www.filtermaster-dpf.com.

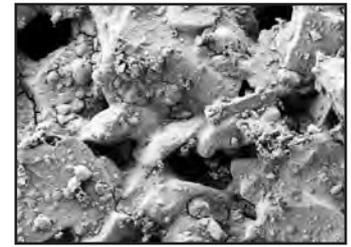
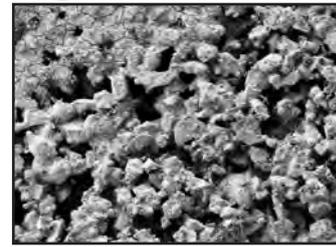
Functionality of the diesel particulate filter



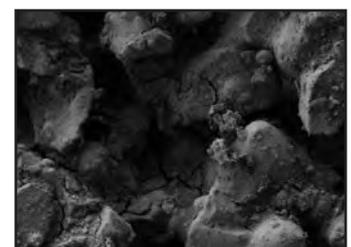
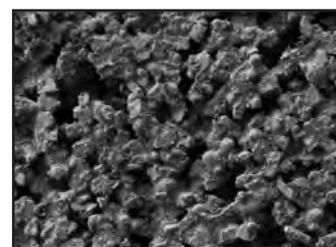


View through the scann

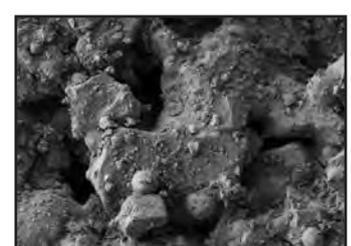
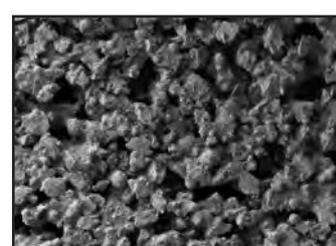
Soiled filters



**Cleaning with
FilterMaster for cars**



**Cleaning with the
thermal procedures**



Since the temperatures for the regeneration of the filter in the real drive mode will be rarely attained, it would be necessary to reduce the ignition temperature. The following procedures are being used:

Uncoated filter with catalytic fuel additive

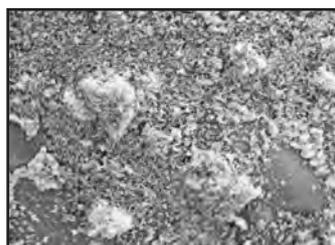
By adding cerium, iron and copper compounds to the fuel, it is possible to attain a reduction of the ignition temperature to about 450°C. However, through the combustion of the additives ashes, such as micro-fine iron oxides, will be formed and remain in the filter. Therefore, filters need to be replaced every 120,000 km.

Catalytic coated filter

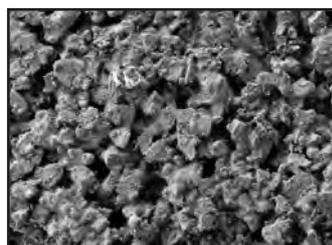
In an upstream oxidation catalyse or in the coated filter itself NO₂ is being formed from nitrogen oxides. In the downstream soot filter, this NO₂ will react at temperatures from about 350°C on. It reacts with the soot and forms carbon dioxide and nitrogen oxides. While operating at little load and the higher loading degree resulting hereof, an active regeneration will be initiated cyclically by increasing the exhaust gas temperature by motor control to 550°C.

ing electron microscope

Soiled filter



200 nm



100 μm

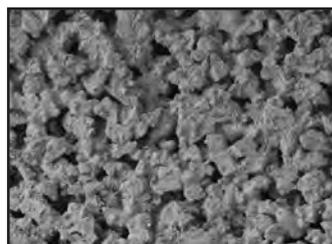


10 μm

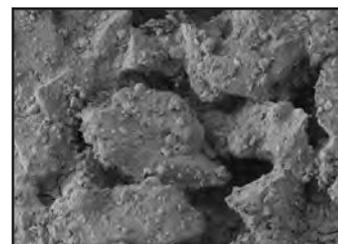
Cleaning with FilterMaster for trucks and more



200 nm



100 μm



10 μm

IDEAS
IDEEEN

COMPETENCE
KOMPETENZ

INNOVATION
INNOVATION

QUALITY
QUALITÄT

RELIABILITY
ZUVERLÄSSIGKEIT

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