

VERT® Information

The new EU-NRMM-Regulation Proposal targets carcinogenic nanoparticles but not strict enough

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Today Diesel Particle Filters (DPFs) are available for all kinds of Diesel engines. Besides millions of passenger cars and trucks, there are already more than 50,000 non road mobile machines (NRMM) in the power range of 10 to 1,000 kW, about 600 rail machines and locomotives in the power range of 50 to 3,000 kW, ships on Swiss lakes and Berlin waterways, stationary engines, as well as hundreds of tractors equipped with DPFs.



Fig. 1: DPFs are available for all kinds of Diesel engines

DPF Technology is widely available. Modern wall flow filters are able to reduce Diesel particle number emissions by 99.99 %. The filter technology that has been successfully introduced through European emission legislation Euro 6/VI in more than 90 million Diesel passenger cars and 5 million trucks is basically the same for NRMM.



In a DPF, Diesel exhaust is forced to flow through porous filter walls in which even the smallest lung penetrating and carcinogenic Diesel particles are collected. After being trapped the particles are catalytically or thermally oxidized and decomposed into gaseous components. Thus the particles are eliminated and negative health effects are minimized.

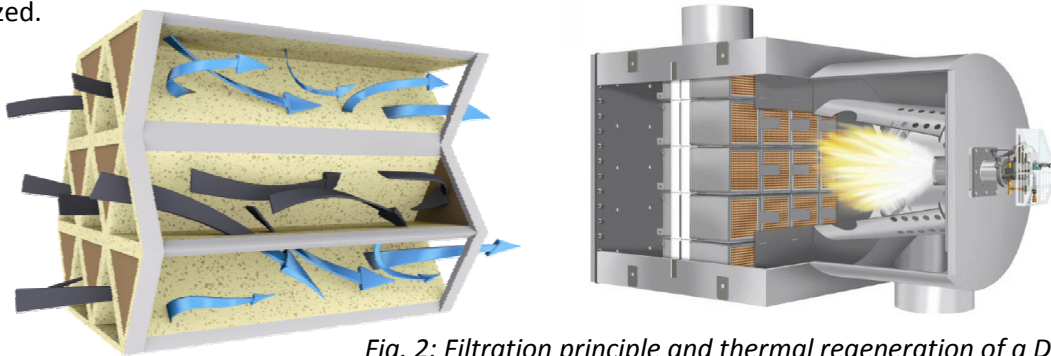


Fig. 2: Filtration principle and thermal regeneration of a DPF

The statistical figures gathered by Swiss authorities show a clear picture: Modern NRMM with VERT-certified particle filters show particle number emissions of 1×10^{11} /kWh or less. So an **European emissions limit of 1×10^{12} /kWh would be too high by an order of a magnitude.** The technology required to achieve the lower emissions level is not only available, but has already been implemented in modern Diesel engines.

testing since 2008 of new engines acc. NRMM regulation

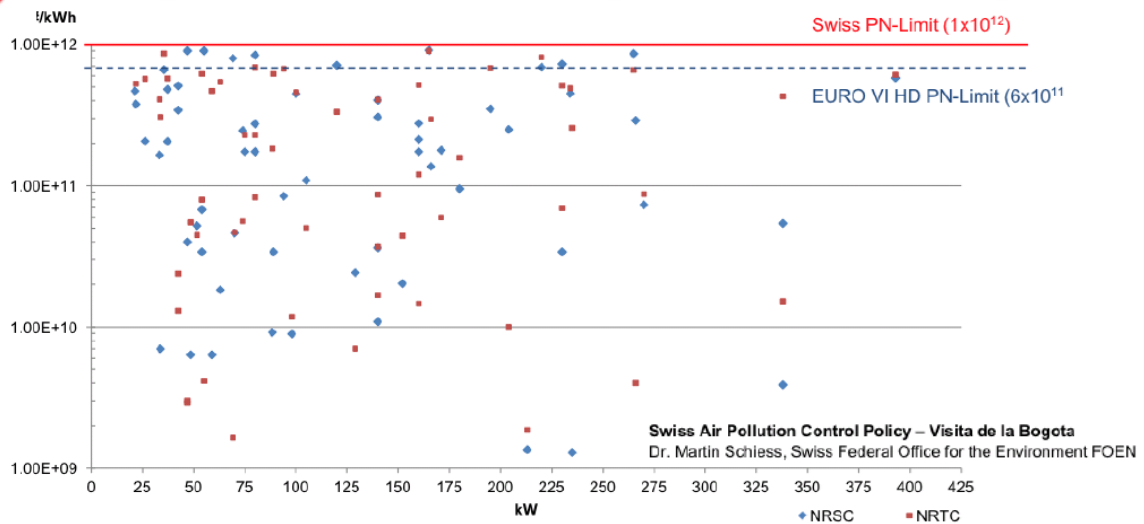


Fig. 3: Statistical figures of particle number emissions of NRMM: Modern engines manage to emit particle numbers less than 1×10^{11} /kWh (Swiss Federal Office for the Environment FOEN)



The **VERT[®] Association therefore supports** the implementation of an emission limit for Diesel engines on the basis of **particle number measurements**. The particle number emissions limit should definitely be **less than 1×10^{11} /kWh**. Since DPFs are available for all kinds of Diesel engines, there is no need to exempt **small (< 19 kW) or large engines (> 560 kW)**. **All engines** sizes and all applications should be included into the legislation, and no Diesel engines should be operated without a filter to protect the health of our citizens.

DPFs are mandatory in many countries in a variety of applications, and successfully minimize the risk of negative health affects. **Only an emission limit with competitive particulate number count** will lead to the implementation of the best available technology, such as that already being implemented in the following programs:

- Occupational health in Switzerland SUVA since 2000
- Occupational health indoor in Germany through TRGS554
- NRM in Switzerland since 2002 through Baurichtlinie Luft, LRV
- Off road regulation in California since 2006
- On road regulation in California since 2010
- Off road low emission zone in Berlin as of July 2015
- Inland water vessels in Switzerland since 2010
- Locomotives in Switzerland since 2010

According to the latest WHO report Europe is facing **600,000 premature deaths** per year due to air contamination. This causes costs equivalent to 10% of Europe's gross domestic product GDP. Compared to the costs of Diesel particle filters for all engines, there is a **benefit/cost ratio of 30** for new engines and 10 for retrofit of in use engines.

There is no emission reduction technology nearly as efficient and cost effective as Diesel particle filters, which eliminate nearly all carcinogenic components. With DPFs, a particle number emissions limit **less than 1×10^{11} /kWh** can be reached easily and cost effectively.

For **more information** please refer to
The Homepage of the VERT[®] Association

www.vert-certification.eu ,

The 19th ETH-Conference on Combustion Generated Nanoparticles, Zurich, Switzerland

www.lav.ethz.ch/nanoparticle_conf.





About the VERT[®] Association:

- VERT[®] stands for Verification of Emission Reduction Technologies
- The Association is dedicated to Best Available Technology for emission control
- Members of VERT[®] are international manufacturers of engines, testing devices, DPF and SCR systems, as well as of substrate producers, chassis builders and others
- Constant objective of VERT[®] is the minimization of the health burden caused by combustion engine emissions
- VERT[®] is focused on particle number measurement to eliminate Ultra Fine Particles (UFP)
- Certification of emission control technology and publication on the VERT[®] filter list (VERT[®] Label)
- As partner of Megacities, VERT[®] supports traffic pollution reduction programs all over the world

