



A diesel particulate filter that protects against viruses

Andreas Mayer has worked for decades on equipping construction machinery and other diesel vehicles with particulate filters. Now, with his start-up NanoCleanAir, the engineer wants to use diesel filter technologies to protect hospital staff from viruses.

« Filters for diesel particles take some time to become effective. Our virus filters are designed to provide complete protection from the very first second. »

– Andreas Mayer, CEO



CONTEXT

Soot particles from diesel engines are harmful to health. That's why particulate filters were introduced in the 1990s to protect construction workers in the NRLA tunnels from the soot particles from construction machinery – and why, since 2008, it has been compulsory for all Swiss diesel vehicles to be fitted with a particulate filter. Since 1990, Andreas Mayer and his engineering firm have supported the introduction of particulate filters in numerous projects. When the coronavirus pandemic broke out in spring 2020, the then 83-year-old mechanical engineer immediately realised that viruses are roughly the same size as soot particles, so the filters that remove diesel soot should also be able to protect against coronaviruses. That's how he and the rest of the team came to found the company NanoCleanAir.

TECHNOLOGY

A scientific study at the University of Fribourg showed that the filters kept out 99.9999% of viruses – so provided even better protection against viruses than against diesel particles. NanoCleanAir subsequently launched three pilot projects: virus filters were fitted in a school in Lenzburg; a lift cabin constructed by the Bern-based firm Emch Aufzüge AG; and hospital beds at the Inselspital in Bern. This last application has become NanoCleanAir's business case: a canopy – a sort of vacuum cleaner – is installed above the hospital beds. It sucks in the air above the bed and cleans it of viruses using filters, thus protecting hospital staff and other nearby patients from infection.

MATURITY

Particle filters for diesel engines have spread across the globe over the last 25 years: today, around 300 million are in use worldwide. The virus-cleaning canopy for hospital beds, on the other hand, is still in its infancy: two samples have been undergoing testing at the University Clinic for Infectious Diseases at the Inselspital in Bern since February 2022. Although the urgency has eased with the end of the pandemic, Mayer is convinced that his canopy could prove invaluable to hospitals – particularly in protecting the most vulnerable patients. He hopes to see the first orders coming in from hospitals in 2025, paving the way for the product to be fully commercialised.

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