

Germ contamination in the classroom - UV-C air disinfection in schools

## **New study on the effectiveness of UV-C air purifiers in classrooms**

In cooperation with the HTWK Leipzig, Dinies Technologies GmbH examined the effectiveness of UV-C air disinfection devices in unventilated classrooms. With the help of flow simulations for the spread of virus particles in the room air, it was possible to show, in comparison to experimental investigations under real conditions, that UV-C air purifiers are suitable for the treatment of contaminated room air.

The COVID-19 pandemic is hitting hard once again throughout Europe and even the vaccinated people are affected. In schools, in particular, there is still a state of emergency. With regard to the cold season, it is necessary to test new technologies in order to provide students with a safe and comfortable learning environment.

**Location and test:** The effectiveness of UV-C air purifiers was examined in a classroom during class. A 65 m<sup>2</sup> primary school classroom in the Black Forest was equipped with highly sensitive germ counters and two air disinfection devices from Dinies. Among other things, these devices have the advantage that they require little maintenance and there is no need to replace contaminated filters, which can again pose a risk of contamination during their cleaning and maintenance. The built-in UV-C tubes disinfect the air by deactivating viruses and bacteria and produce little noise. In addition, the devices are easy to install and do not require much space.

**Procedure and result:** The airborne germ test was carried out over three school hours. External ventilation was not used after the respective school hours in order not to falsify the effect of air disinfection. To evaluate the disinfection performance, the real measurements of Dinies Technologies GmbH were compared with the flow simulations of the HTWK Leipzig (University of Technology, Economics and Culture Leipzig). In the simulations, the classroom was provided with an initial concentration of virally contaminated air, which is continuously increased over the period of time, through their breathing or by an infectious teacher in the room. As is generally to be expected, the results initially show that when the windows are closed, a significant increase in the germ load in the room can be expected (blue curve, Fig. 2). In Fig. 2 it can also be clearly seen that the use of UV-C devices lowers the germ load (green curve) from the start, which is in agreement with the experimental measurements (orange curve). However, the simulation results show a slightly better disinfection performance compared to the real germ measurement, since the flow simulations cannot depict all germs that may require longer UV-C irradiation (some bacteria or fungi). In relation to rooms without air disinfection devices, the results clearly show that a significant reduction in the germ load can be achieved with the help of UV-C air disinfectants, which in turn leads to a lower risk of infection.

## **Dinies Technologies GmbH**

The Baden-Württemberg company Dinies Technologies GmbH has over 35 years of experience in UV-C technology. The safe and environmentally friendly UV-C air and surface disinfection devices were developed for a wide range of applications, which means that the right solution can be found for every situation. Dinies' products are characterized by their robust construction, low maintenance requirements, simple installation and inexpensive acquisition costs.



Image 1 Dinies UVG80 Air Disinfection in a classroom

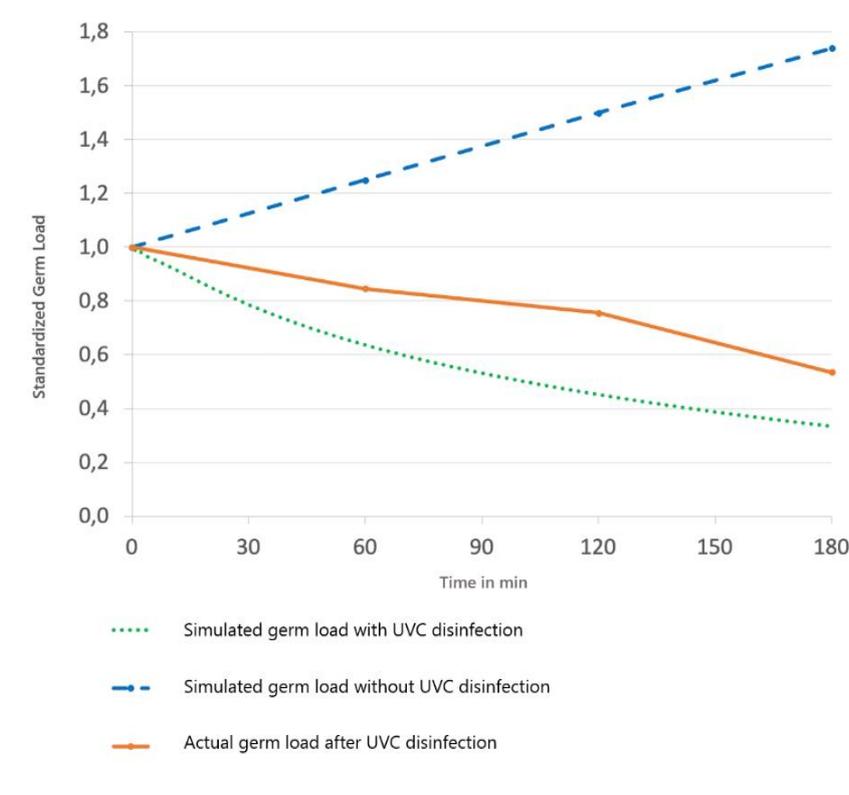


Image 2 Change in the germ load in the classroom with and without UV-C air disinfection over time