

TANK DISINFECTION WITH UV LIGHT

HyDe is developing disinfection systems suitable for storage tanks based on the application of UV-C LEDs



► **HYDE** Gesellschaft für Hygiene und Desinfektionstechnologie (Company for Hygiene and Disinfection Technology) was founded in Saxony, Germany, as a start-up for developing, producing and selling UV light disinfection devices. HyDe operates in various industry segments, such as automotive, sanitary, public transport, food and beverages, as well as storage tank farms.

BLOCKING VIRUS TRANSMISSION

The transmission of pathogens, especially viruses like COVID-19, locally as well as internationally, has become a very relevant topic in 2020. The worldwide exchange of people and goods along any kind of supply chain must remain stable even under pandemic situations. Disinfection is the most important countermeasure against viruses where no vaccine exists and will remain so even once a vaccine is developed, as immunisation is a very time-consuming process. Pathogens can be spread between individuals and on equipment and containers of any size. Everything from small personal items to large containers for storage and transport should be treated. The use of chemicals is costly and may lead to undesired side effects, so technical solutions using UV radiation are a useful alternative.

UV TECHNOLOGY

Photons in the UV spectral range can initiate chemical reactions. DNA and RNA, found inside viruses, can be cracked very efficiently by radiation in the 240–280 nm range, which in turn is part of UV-C radiation. Depending on the species and wavelength, 40 µJ / cm² can lead to a log₅, i.e. 99.999%, deactivation of virus populations. Bacteria and fungi react differently to UV radiation. Here longer wavelengths may be more effective for deactivation. Thus, properly adjusted UV compositions (UV-C, UV-B and UV-A) can

be applied against all kind of pathogens, including viruses, bacteria and fungi, in one single disinfection step.

The generation of UV light using low pressure gas discharges is well established. The mercury line at 253.65 nm is very strong and transfers electrical energy efficiently to radiation, but the use of mercury and the outline of the discharge lamps limits its applications. Other options have been investigated as well, like excimer sources, but here halogens are typically used. Mercury and excimers also have emission lines below 240 nm which generate undesirable ozone in air.

Today, the availability of UV LED light sources opens options for new systems designs. LED-based systems can be compact, robust, efficient and tailored to the application. The first examples have already entered the market or are close to product launch. Decreasing device prices and increasing power available will now open up the field of large area disinfection.

HYDE SYSTEMS

HyDe started with the development of automatic LED UV disinfection for toilet seats. The UV sources are placed in the top, facing towards the seat ring. 1,100 mW of UV-C LED illumination at 260 nm are applied during a 30-second disinfection process. The product launch is on the way. Similar to the development of LEDs in the visible range, it is expected that the price per unit will decrease 50% annually whilst the power will double in the same time period.

Based on this experience, HyDe is now developing disinfection technology for loading and packaging systems and for storage and transport containers in a wide range of volumes and sizes. The power applied and the timing for the disinfection can be adjusted, optimising installation effort and power consumption. Sensors, electronic

controls, light sources and the optical properties of the system can also all be optimised to ensure proper operation.

Disinfection is vital in any application today. UV light can be used to replace chemical agents, saving material and work time and helping to protect the environment. The first system designs have been demonstrated, and new system developments are planned, especially in the field of logistics and storage. Here HyDe contributes and can be your partner for innovation. The company's intention is to sell with its own distributors and agents all over the world, and it would now like to cooperate with system integrators and original equipment manufacturers (OEM) for applications in tank storage.

For more information:

This article was written by Thomas Brauer and Heinrich Grüger of HyDe.
www.hyde-tec.de

01 UV-C disinfection in a toilet seat

