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CleanScreen – With UV-C inactivation of pathogens to sterile touchscreens

Hygiene is a top priority in times of Corona. Particularly at frequently used vending machines, such as ticket machines, the surfaces of input screens are not cleaned after use. For infection transmission, it doesn't take long to catch a few germs, bacteria or viruses. The "CleanScreen" project (Funding reference 16KN082123), funded by the Federal Ministry for Economic Affairs and Energy (BMWi), now aims to find a remedy. Together with its partners Fischer Electronicsysteme GmbH + Co.KG, RBC GmbH and GMBU e. V. (Department Halle) the Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP is developing an automated solution for the continuous cleaning of touch displays at public vending machines. The project is initiated within the BMWi-funded innovation network "CleanHand" and coordinated by the FGMD GmbH.

Due to the high user frequency, the hygienization of touch displays represents a potential hazard for the transmission of germs. In "CleanScreen", the project partners are developing an automated hygienization solution that disinfects the screen in the shortest possible time without having to clean it manually each time.

But how does it work?

An LED-based UV source continuously disinfects a movable display surface inside the vending machine, which is moved after each user operation. Each user receives a "fresh" surface. In this way, cleaning is achieved between each user operation and the risk of germ transmission is minimized.

Dr. Gaby Gotzmann, Deputy Head of Division "Medical and Biotechnological Applications", at Fraunhofer FEP, is pleased with the first promising results: "After just a few seconds of treatment with UV-C light in the immediate vicinity of the surface, 99.99% of the pathogens are inactivated. Bacillus subtilis spores, which are considered particularly resistant to radiation, serve as the model microorganism within our experiments."

The great advantage of the new system is that it operates continuously and can be integrated directly into the vending machine. This makes manual cleaning of the displays between each user unnecessary, and at the same time the user is not exposed to UV radiation. In addition, there are no waiting times between each user operation.



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Based on many years of experience in the field of germ inactivation, Fraunhofer FEP acts as a linking partner between biology and technology in the project. Here, a defined test procedure is carried out in the laboratory to evaluate the effectiveness of the developed technology: the display surface of the system is inoculated with germs, and after the subsequent disinfection of the display with UV-C light, an agar plate count test is used to determine the remaining number of vital germs. The result is used to determine whether there is a need for further development.

The consortium expects a first prototype in mid-2022, and project partners Fischer Electronicsysteme GmbH + Co. KG and RBC GmbH will be able to ensure rapid industrial implementation after completion.

In addition to this project, Fraunhofer FEP's "Medical and Biotechnological Applications" department is also working on the currently highly charged topic of hygienization. Starting with surface hygienization by UV-active coatings or surface functionalization by electron beam grafting of antiviral substances on textiles up to mobile disinfection technologies for automated surface disinfection in public areas. This work will be presented in more detail at the 2nd virtual edition of MedTecLive trade show from April 20–22, 2021.



Touchscreens in public areas such as ticket machines quickly become transmitters of bacteria and germs. The "CleanScreen" project is intended to provide a remedy

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About CleanScreen:

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Project partners:

The project "CleanScreen" is initiated by the company FGMD GmbH (www.fgmd.de) within the framework of the innovation network "CleanHand" (www.cleanhand.de) and coordinated by them.

Fischer Electronicsysteme GmbH + Co.KG, www.fischer-electronic.de
RBC GmbH, www.rbc-energy.de
GMBU e.V. (Department Halle), www.gmbu.de

MedTecLive, 2nd Virtual Edition

Date: April 20 - 22, 2021
www.medteclive.com
Fraunhofer FEP will be exhibitor at the virtual edition of MedTecLive 2021.

To the exhibitor list: www.medteclive.com/en/exhibitors-products/exhibitor-list

The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competencies electron beam technologies, roll-to-roll technology, plasma-activated large-area and precision coating as well as technologies for organic electronics and IC design provide a basis for these activities. Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, sensors, optical filters and flexible OLED lighting. Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.