Fraunhofer FEP

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Hygiene at your fingertips with the new CleanHand Network

The Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP has been involved in developing processes and equipment for cleaning, sterilization, and surface modification for decades. The CleanHand Network for development of systems and technologies to clean surfaces, materials, and objects was established in May 2018 to bundle the expertise of many partnering organizations. As a partner in the CleanHand Network, Fraunhofer FEP will present the Network and current research topics of the Institute in the field of hygiene and cleaning at the parts2clean trade fair, October 23–25, 2018 in Stuttgart, at the booth of the Fraunhofer Cleaning Technology Alliance (Hall 5, Booth C31).

Test reports and studies on the cleanliness of European motorway rest areas, hotel beds, and outdoor pools increasingly appear in the press, especially during peak travel periods. In addition, there are regular reports on the spread of germs in hospitals, kindergartens, and nursing homes. The transmission and spread of infectious diseases and germs takes place in the majority of cases via ubiquitous door handles and washroom fixtures that cannot be avoided in daily life. But smartphones have also been tested for contamination and turned out to be a perfect habitat for bacteria, with an average of 3895 bacteria per square centimeter. Only dishcloths were found to have more bacteria.

In most cases, the main transmission path of bacteria and germs is obviously by manual contact. To interrupt the transmission paths, common items such as door handles and handrails must be given careful consideration. They should be made of materials or have surfaces that repel dirt, are easy to clean and disinfect, and do not provide conditions that promote harboring dirt, bacteria, and germs. The solutions for this are diverse, starting with antibacterial surfaces up to specialized surface modification and practical disinfection methods.

The topic of sterile surfaces and its many aspects therefore continues to be of current interest. Fraunhofer FEP has been involved in the development of processes and systems for cleaning, sterilization, and surface modification for decades. In the course of many projects, the scientists and partners have identified an increasing need for networking in this area. In order to make better use of synergies and to advance joint projects for disinfecting everyday objects as well as application-oriented R&D in a

CleanHand

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focused manner, the decision was made to establish a network.

The CleanHand Innovation Network was therefore established in May 2018 as a consortium to develop systems and technologies for clean surfaces, materials, and objects. The Network is funded by the German Federal Ministry for Economic Affairs and Energy (BMWi, promotional reference 16KN082101). Initial projects focus on the development of disinfection technologies and procedures for door handles in public buildings, handholds in public transport, and the disinfection of touchscreens, such as in airports, railway stations, and elsewhere.

One of the members is the Fraunhofer FEP with expertise in R&D for the application of electrons in disinfection and sterilization applications, along with many years of accumulated know-how in antimicrobial coatings and easy-to-clean layers. The Institute's own biomedical laboratory with a wide range of tests including antibacterial efficacy, supports these research priorities.

Dr. Jessy Schönfelder, deputy head of Medical and Biotechnological Applications at Fraunhofer FEP, summarizes: "With our experience in the use of low-energy electrons for disinfection and sterilization of surfaces, the use of silver and copper for antibacterial coatings, as well as in the development of hydrophilic surfaces and photocatalytic layers, we can apply many different technologies. When developing specific applications, we can rely on these technologies in order to find innovative and practical solutions with our partners in the Network".

In addition to the initial project for disinfecting various contact points in public areas, further ideas and projects are to be developed by members of the Network together with new partners in the field of hand hygiene. The CleanHand Network intends to address partners and future customers that have problems related to hand hygiene and associated topics from the fields of medical engineering, the environment, health, and the life sciences in order to jointly develop solutions for practical applications, such as self-disinfecting fixtures for hospitals and areas requiring intensive cleaning.

During the parts2clean 2018 trade fair October 23–25 in Stuttgart, we offer the opportunity to learn about the Network at the Fraunhofer FEP booth.

Fraunhofer FEP at parts2clean 2018
Hall 5, Booth C31 (Fraunhofer joint booth)

Special Exhibition: Part Cleaning 4.0 in Practice
Hall 5, Booth A18

Network research partners
Augst Kunststoff-Produkte GmbH
BRAND Werkzeug- und Maschinenbau GmbH
car systems Scheil GmbH & Co. KG
CGC Instruments
DeSonic GmbH
ECTC Steuerungstechnik GmbH
Fraunhofer FEP
Gesellschaft zur Förderung von Medizin-, Bio- und Umwelttechnologien e.V. (society for the promotion of medical, bio- and environmental technologies)
MicroCeram GmbH
MoveoMed GmbH
SF Automationselektronik GmbH
Schliess- und Sicherungssysteme GmbH
RAS AG
Jena University Hospital

Electron-beam sterilized packaging in the medical field
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Superhydrophilic titanium dioxide layer (right) as an easy-to-clean coating
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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 competences electron beam technology, sputtering and plasma-activated deposition, high-rate PECVD as well as technologies for the organic electronics and IC/system 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, organic and inorganic 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.