

PRESS RELEASE

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New process for combating germs: tailored antimicrobial coatings for surfaces

The Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP is one of the leading institutions for collaborative research and development in thin-film technologies and electron-beam applications. The developed technologies are being effectively successfully employed in the fight against germs.

Just recently the World Health Organization (WHO) published a list with twelve families of bacteria that are resistant to conventional antibiotics. But dangerous germs are not only found in hospitals – they are lurking everywhere. The German publication Testbild tested ten hotel rooms in Berlin and found an “exceptionally high concentration of multi-resistant Staphylococci” in eight of them. That sounds alarming.

For that reason, there is not just urgent work being done on new antibiotics, but on antimicrobial coatings as well as on processes for germ reduction and neutralization on surfaces found in daily life, especially for surfaces of medical products.

Scientists at Fraunhofer FEP have already been working for several years on antibacterial coatings for textile and polymeric surfaces that are highly effective yet tolerated by cells. PVD processes (physical vapor deposition) are employed for tailored and efficient coating of large areas. The scientists make use of the antibacterial effect of silver and copper, for example. In addition, the surface morphology and energetic characteristics work against bacterial adhesion. That means germs are completely unable to even begin to gather on the surface. This strategy is also used for modifying the surfaces of coatings by means of non-thermal electron-beam technology in which the adhesion characteristics of surfaces can be specifically adapted.

“The precise composition and release of antimicrobial metal ions is especially important for metallic antibacterial coatings in order to ensure high effectiveness in the fight against germs while at the same time preserving compatibility with cells,” explains Dr. Jessy Schönfelder, head of the Medical Applications Group at Fraunhofer FEP. “Our know-how enables us to create a suitable ratio of components for any purpose and apply it to the surfaces to achieve modified and adapted surfaces with respect to their specific application.”

Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP

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The effectiveness and the mechanisms of dissolution of the antibacterial metallic ions diffusing from the coatings were investigated using of *Escherichia coli* K12 bacteria. Cell biology experiments also demonstrated the compatibility of these coatings with human cells.

The scientists are now prepared to develop tailored coatings for any kind of application instance in the fight against germs.

During the SVC TechCon from April 29 to May 4th, 2017 in Providence, Rhode Island, USA, scientists of Fraunhofer FEP will present latest research and development results in coating technologies at our booth no. 319 and during the conference.

**Fraunhofer FEP at SVC TechCon,
April 29 – May 4, 2017, Providence, Rhode Island, USA:**

Exhibition: booth no. 319

Monday, May 1, 2017:

10:40 AM

Session: WebTech Roll-to-Roll Coatings for High-End Applications I, 553AB
Roll to roll deposition of transparent electrodes on permeation barrier coatings
Matthias Fahland, Fraunhofer FEP, Dresden, Germany

02:00 PM

Session: Coatings and Processes for Biomedical & Environmental Applications I, 553AB
Silver/copper-mixed layers as antimicrobial surface coating
Jessy Schönfelder, Fraunhofer FEP, Dresden, Germany

03:00 PM

Session: Coatings and Processes for Biomedical & Environmental Applications I, 553AB
Low Energy Electron Beam Irradiation of Liquids for Medical Applications
Javier Portillo, Fraunhofer FEP, Dresden, Germany

04:00 PM

Session: Coatings and Processes for Biomedical & Environmental Applications II, 553AB
DLC for medical-technical applications modified by electron beam
Jessy Schönfelder, Fraunhofer FEP, Dresden, Germany

04:20 PM

Session: Coatings and Processes for Biomedical & Environmental Applications II, 553AB
Low Energy Electron Beam Sterilization for Medical Technical Applications
Javier Portillo Casado, Fraunhofer FEP, Dresden, Germany

Tuesday, May 2, 2017:**10:20 AM**

Session: WebTech Roll-to-Roll Coatings for High-End Applications II, 553AB

Sponsored Student: Roll-to-roll deposition of permeation barrier layers using a rotatable dual magnetron system

Anika Himmler, Fraunhofer FEP, Dresden, Germany

Wednesday, May 3, 2017:**10:20 AM**

Session: Large Area Coatings I, Ballroom BC

Recent Developments of Optimized ITO Coatings on Ultra-Thin Flexible Glass in S2S and R2R processes

Manuela Junghänel, Fraunhofer FEP, Dresden, Germany

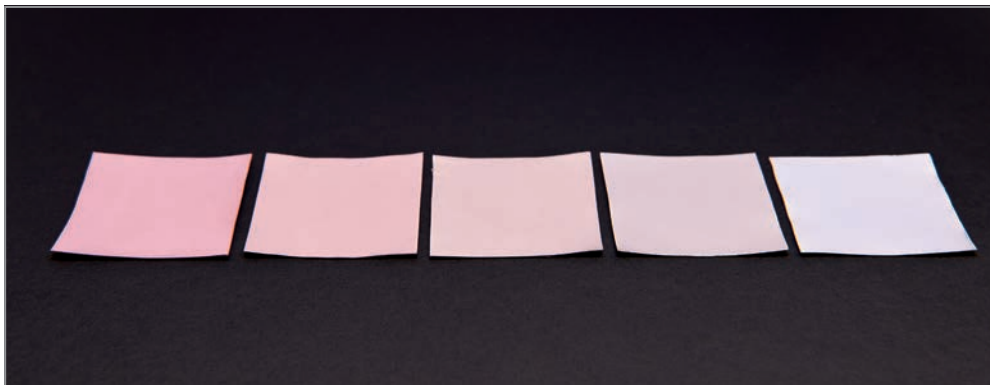
POSTER Session**Tuesday, May 2, 2017: 02:00 – 03:30 PM**

Influence of Thin-Film Properties on the Reliability of ultra-thin Glass

Jasper Westphalen, Fraunhofer FEP, Dresden, Germany

Nanostructuring on polymer surfaces by magnetron plasma treatment

John Fahlteich, Fraunhofer FEP, Dresden, Germany

**Antibacterial coatings from Fraunhofer FEP**

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www.fep.fraunhofer.de/press**Sources**www.who.int/mediacentre/news/releases/2017/bacteria-antibiotics-needed/enwww.ptext.de/nachrichten/testbild-hotelketten-test-multiresistente-keime-hotelzimmern-foto-1190449

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.