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Thin Films and Surface Treatment for
Energy · Biomedical Application · Optics · Tools & Components

2023 VACUUM PLASMA SURFACE COATING

EFDS

Keynote Lecture

Plasma and surface technologies for energy applications and sustainablity

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Anthropological climate change is one of the largest challenges facing society today and as a result, there is an urgent need to reduce human impact on the environment. The Fraunhofer Society has the mission of developing innovative solutions to societal problems by creating a bridge between fundamental research and industrial-scaled applications. The Fraunhofer FEP in Dresden has expertise in the development and application of electron beam and plasma technologies for vacuum coatings and surface treatments, and we work closely with academic and industrial partners to scale-up laboratory solutions to meet commercial demands for applications in the fields of energy and environment, life sciences, and microelectronics. Our aim is to overcome bottlenecks in cost, reliability, and performance towards reliable and scalable solutions for surface engineering, film deposition, and system integration.

In this talk, I will present results from research areas at the Fraunhofer FEP in the field of plasma and surface technologies for sustainable solutions ranging from energy storage and conversion, energy efficient glazing, sustainable packaging, biomedical and life sciences, man-machine interfaces, to sensing applications. The focus is on the development of tailored hardware platforms and processes to enable the deposition of functional and/or critical materials on a wide range of surfaces, including flexible, rigid, and biologically-relevant substrates. Further, I will highlight our recent activities in the area of plasma-synthesis for sustainable routes towards the synthesis of valuable chemical precursors for the chemical industry, energy storage and fuels, as well as early approaches to implement machine learning and advanced process control to enable efficient protocols for film deposition and surface engineering applications.