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New techniques and opportunities for 3D component coating

The Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, one of the leading research and development partners for development of surface technologies, is introducing its new 3D electron beam deposition equipment named NOVELLA following its successful commissioning. NOVELLA offers new avenues and opportunities for efficient high-rate electron beam deposition of 3D components.

Coatings play a considerable role in increasing the functionality of components. High-performance applied layers protect components from premature mechanical wear and tear, chemical and thermal degradation or minimize frictional losses in dynamic systems. Under operating conditions coated 3D parts are exposed to extreme stress since the effects are maximized at higher temperatures and pressures, or components must bear the same loads at reduced weight. Component and coating must therefore be matched to each other in order to withstand these load conditions, which increasingly demands systems of layers with complex composition.

With the aim of developing resource-conserving and efficiency-raising technologies in machinery and plant engineering, industry also faces the challenge of cost efficiency in coating of components with three-dimensional geometry for functional optimization.

NOVELLA, an experimental platform jointly developed by Fraunhofer FEP and CREAVAC GmbH, offers efficient high-rate electron beam deposition of 3D components. The facility permits pre-treatment, plasma-activated evaporation as well as hybrid processes in which electron beam technology can be combined with magnetron sputtering and plasma-activated chemical vapor deposition.

Dr. Jens-Peter Heinß, head of the Component Coating Group at Fraunhofer FEP, explains: "The design of the installation offers our research partners and industrial clients currently unique capabilities for feasibility studies and material development. The high coating rates that we achieve enable the processes to be planned and executed more productively and in the end more economically."

Dr. Heinß will be presenting the innovative design of the unit at the 15th International Conference on Plasma Surface Engineering in Garmisch-Partenkirchen, Germany from September 12–16, 2016.

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FRAUNHOFER INSTITUTE FOR ORGANIC ELECTRONICS, ELECTRON BEAM AND PLASMA TECHNOLOGY FEP

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Fraunhofer FEP will be conducting a dedicated workshop on the new installation entitled "Vision Components" on October 11, 2016. The NOVELLA facility and its vacuum coating capabilities will be presented to an audience of technical experts from various branches of industry and science there. Current trends in vacuum coating engineering, such as wear protection and tribologic applications, will be discussed and new approaches to solutions will be presented.

Important results for developing the design of NOVELLA experimental platform were incorporated from the collaborative project "3DEB" funded by the European Union and the Free State of Saxony (grant agreement no 100146071).



NOVELLA – facility for coating 3D components

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Coating of 3D components

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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. COMEDD (Center for Organics, Materials and Electronic Devices Dresden) with all known activities in organic electronics is now acting as a new business unit at Fraunhofer FEP, Dresden, Germany.