

# PRESS RELEASE

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## Opening of the Fraunhofer Research Center for RESource-Efficient Energy Technologies (RESET)

**The Fraunhofer Institute for Electron Beam and Plasma Technology FEP expands its campus with the RESource-Efficient Energy Technologies (RESET) research center in Dresden. With state-of-the-art laboratory facilities for sputter epitaxy, biomedical applications and electron beam technologies, the institute aims to set new standards in research. The strategic research focus for activities in the building are the development of innovative process technologies, for example for the generation, storage and processing of hydrogen (power-to-X) and for the deposition of high-precision gallium nitride (GaN) layers on silicon wafers. The opening was attended by high-ranking guests from industry and politics.**

As one of the first Fraunhofer Institutes in Dresden, the Fraunhofer Institute for Electron Beam and Plasma Technology FEP has been a fixture in the research landscape of the Saxon state capital for more than 30 years. The institute applies its specialized core competencies in electron beam and plasma technology to develop innovative surface functionalization processes and vacuum technologies for a wide range of substrates, from flexible films and bulk materials to metal strips and ultra-thin glass.

In addition to coating and process development for customers and partners from a wide range of industries, the Fraunhofer FEP is uniquely able to offer these processes in-house, from laboratory tests to pilot production. This provides customers with a reliable basis for transferring complete processes for surface modification and thin film coating to commercial application based on the institute's access to plant technology infrastructure ranging from laboratory scale to industrial sheet-to-sheet and roll-to-roll coating lines and systems for precision coating.

To ensure that we can continue offering innovative technologies for sustainable solutions for the future and to perform research and development close to the pulse of the times, the campus has expanded in recent years to include several buildings and areas at Winterbergstrasse 31f in Dresden, Germany. In addition to a technical center for nanotechnologies and precision coating, the last construction phase of the Fraunhofer Research Center for Resource Efficient Energy Technologies (RESET) has now been completed.

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In a festive inauguration ceremony, Institute Director Prof. Elizabeth von Hauff opened the now completed Fraunhofer Campus together with State Secretary Prof. Thomas Popp, the President of the Fraunhofer-Gesellschaft Prof. Holger Hanselka and Dresden's Lord Mayor Dirk Hilbert.

Prof. Elizabeth von Hauff is delighted: "I am happy and proud to see that the campus is expanding to include state-of-the-art laboratories for biomedical applications, a clean room for our research in the field of sputter epitaxy, as well as its attractive rooms for creative and collaborative work for our researchers. I would like to thank the Free State of Saxony, the Fraunhofer-Gesellschaft and the state capital of Dresden for their many years of support for this project at all levels. I would also like to express my sincere thanks to all the colleagues at the institute who have driven this project forward over the years. They have put their heart and soul into it and have enabled the construction of a flagship for energy-efficient and sustainable buildings for applied research and development."

### **Electron Beam Competence and Technology Center for Biomedicine and Environmental Technologies**

The planned research projects at RESET are determined by the establishment of a globally unique electron beam competence and technology center. Based on the already established competence center for thermal electron beam technologies at RESET and the significantly broader research base of the Fraunhofer FEP in the fields of electron beam applications, the future viability of the competence and technology center is to be ensured by establishing further fields of work.

The completed building ensemble now houses facilities for the development of non-thermal electron beam technologies for medical, biotechnology, environmental and energy applications. They provide the basis for the sterilization and hygienization of medical products, efficient plasma-chemical synthesis processes and the chemical-free treatment of seeds.

Furthermore, a beam chamber with X-ray safe shielding of up to 600 keV offers the opportunity to test and advance our own new developments in the field of electron beam technology in accordance with market and customer requirements. One example of this is the development of new types of electron beam sources, e. g. for the high-throughput treatment of gases and liquids.

In addition, a newly established biomedical laboratory complex is conducting research into topics such as new processes with electron-stimulated microorganisms for metal recovery through bioleaching or the production of bio-based materials. The use of photosynthetic microorganisms for the sustainable and CO<sub>2</sub>-neutral provision of raw materials is also to be investigated. In the near future, these laboratories can be operated with biological protection level 2 in order to best serve new sustainable fields of application in life science and environmental technology.

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### **Thin-film plasma technologies**

In addition, a clean room has been set up for research into highly innovative process technologies for sputter epitaxy. A Fraunhofer FEP research group is dedicated to the development of magnetrons and process technologies for sputtering thin layers, e. g. gallium nitride (GaN) layers, on 200 mm silicon wafers and obtaining epitaxial layers. The resulting GaN semiconductors with high-precision layers are to be used in future in power electronics or in applications such as light-emitting diodes (LEDs). In the course of the year, the research group will have a new wafer-based high-temperature and ultra-high-vacuum PVD system available for this purpose, equipped for the first time with wafer handling in accordance with ISO3.

### **Energy management and resource conservation**

In addition to the ultra-modern facilities of the building complex, which now unites previously completed parts of the new research campus with new connecting bridges, great attention was paid to sustainable use and energy-efficient building supply throughout the construction phase. The Fraunhofer FEP is a leader within the Fraunhofer-Gesellschaft in the use of energy management systems and their practical application in operation. The resource-conserving provision and use of all types of energy is implemented, among other things, through the extraction of cooling energy from groundwater, the use of waste heat from the test facilities to heat the building, air conditioning of the laboratories and the clean room by means of adiabatic exhaust air humidification, self-generation of electricity through a PV system and state-of-the-art control of the building technology using a weather forecasting tool, as well as through sustainable green roofs.

The ceremonial opening of the building complex was attended by many invited guests from industry and politics as well as institutions involved in the construction and the Fraunhofer FEP Board of Trustees. Institute Director Prof. Elizabeth von Hauff then gave the Saxon State Secretary Prof. Thomas Popp and the Lord Mayor of Dresden Dirk Hilbert a tour of the new premises and provided an insight into the institute's new research focus. Afterwards, all other guests had the opportunity to take a guided tour of the building and gain a closer insight into the topics covered by the Fraunhofer FEP.

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**Ceremonial inauguration of the Fraunhofer Research Center RESource Efficient Energy Technologies (RESET) with State Secretary Prof. Popp, Mayor Dirk Hilbert, Dr. Ulrike Geiger from Federal Ministry of Education and Research as well as Institute Director Prof. Dr. Elizabeth von Hauff.**

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**New Fraunhofer Research Center RESource-Efficient Energy Technologies (RESET) at Winterbergstrasse 31f in Dresden**

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The **Fraunhofer Institute for Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating and surface treatment. The core competencies electron beam technologies, roll-to-roll technology as well as plasma-activated large-area and precision coating 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 sensors and filters. Our aim is to seize the innovation potential of these technologies for new production processes and devices and to make it available for our customers.