

SAXONY!



WIRTSCHAFTSFÖRDERUNG
SACHSEN



Organic Electronics Saxony

ORGANIC AND FLEXIBLE ELECTRONICS IN SAXONY

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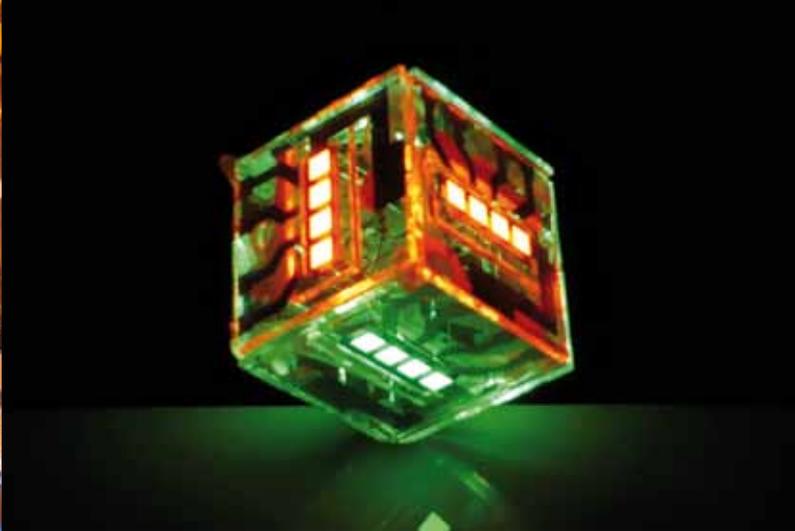
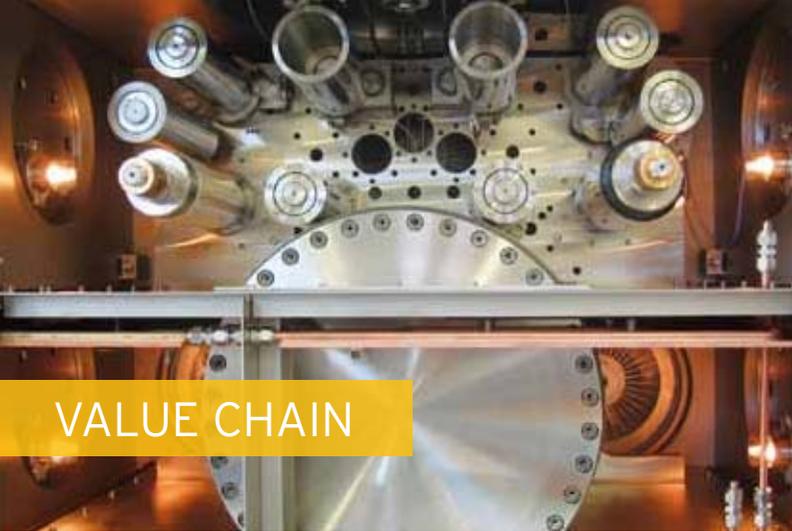
WELCOME

Organic electronics are based on the discovery that specific organic materials possess semiconducting properties. Functional organic layers can be deposited onto solid and flexible substrate carriers; they are light, ultrathin, transparent, and printable. This opens up many new opportunities for the development of such innovative products as, for example, flexible displays, large-scale illumination and lighting, transparent and flexible solar cells as well as intelligent functionalities integrated into clothing or packaging materials.

Saxony is Europe's largest cluster of organic and flexible electronics. Almost 40 companies and 20 research facilities cover the entire value creation chain ranging from fundamental research all the way to finished products. For example, Saxony is the place the technological leaders in energy-efficient organic light-emitting diodes as well as the producers of the most efficient organic solar cells call home.

Saxony's universities possess outstanding competences in technology-specific education and training. Dresden University of Technology provides a program of study which is unique in the entire world – the master's program "Organic and Molecular Electronics." At Chemnitz University of Technology, students are educated in the interdisciplinary and international program of study "Print and Media Technology."

The Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP is Europe's leading center for development and pilot production of devices and manufacturing technologies based on organic semiconductor materials. The Institute for Print and Media Technology at Chemnitz University of Technology is a leading research institution in the printed functionalities and printed electronics sector.



VALUE CHAIN

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DESIGN/ENGINEERING

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DER BLICK FÜRS GANZE

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TEC

VON ARDENNE

Adenso

FHR
centrotherm photovoltaics group

XENON

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CREAPHYS

Sunic
system

DTF
TECHNOLOGY

SEMPA
SYSTEMS

3D MICROMAC

dresden elektronik

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Heliatek
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IVV

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FEP

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IWS

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Basic & Applied Research



COMPANIES

■ The **Novaled GmbH** is a spin-off of Dresden University of Technology and a global leader when it comes to technologies which are required for the production of organic light emitting diodes (OLEDs). The company holds more than 500 patents and runs two branch offices in Japan and South Korea. Since August 2013, the specialist for highly efficient OLED structures with long lifespans has been part of the Samsung Group.

■ The global technology leader in the organic photovoltaics (OPV) sector, the Dresden-based **Heliatek GmbH**, is able to turn glass facades and panoramic cars roofs into energy collectors. With 7.2 percent, the company holds the world record in efficiency for flexible cells with a translucence of 40 percent. Initial pilot projects – for example, in China and Singapore – permitted Heliatek to successfully test the use of the HeliaFilm® solar foil on building facades and roofs made of glass, concrete, and PVC membranes. HeliaFilm® is produced with a globally unique roll-to-roll process in Dresden.

■ **Plastic Logic Germany**, based in Dresden, was established in 2000 by Cambridge University researchers, and in 2007 built the first volume production factory for the manufacture of flexible, yet robust e-paper displays in the world. Here, 100 employees produce organic plastic displays in a wide range of sizes. The technology allows a wide range of robust and lightweight terminal devices and applications, including smartphones and tablets with a second display, smartcards and so-called wearables, such as “smart jewelry.” In 2015, the company FlexEnable, based in Cambridge (GB), was split off and will assume the licensing of the technology in the future.

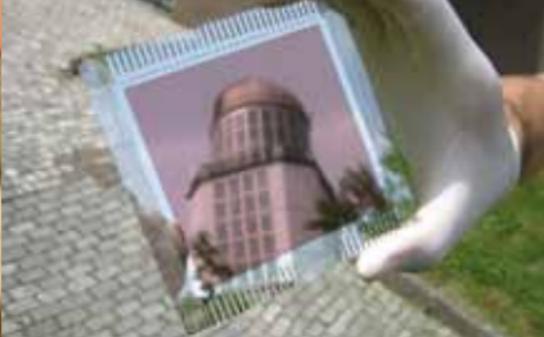


■ Key products of the **dresden elektronik verkehrstechnik gmbh** include control, light signal, and display systems used in traffic management. A specific highlight is “deZign,” a flexible plastic display based on e-paper made by Dresden’s Plastic Logic GmbH with its own autonomous energy. “deZign” stands for data display with “zero” energy consumption; for example, an update only requires a minimum supply of power. – Ideal prerequisites for its use as a “paperless” timetable display system which can be updated merely at the touch of a button. The potential applications for “deZign” might also include dynamically recordable electronic signage systems or advertising media.

■ **VON ARDENNE GmbH** develops and produces systems for industrial nanometer to micrometer thin coatings on such large surface materials as glass, metal bands, or plastic foils at its corporate site in Dresden. In so doing, the company applies such technologies as magnetron sputtering and electron beam evaporators.

■ Laser micromachining is the core competence of the **3D-Micromac AG** in Chemnitz. The company develops and produces machines to be used for the production of photovoltaic components, in semiconductor production as well as in the digital roll-to-roll production of printed functionalities. For example, machines made by 3D-Micromac permit the structuring of OLED’s anode layers or the structuring of organic solar cells.

■ **CreaPhys GmbH**, a spin-off of the Dresden University of Technology, specializes in coating and material purification procedures during the production of organic thin films (for OLEDs and solar cells). The company provides comprehensive expertise in the organic optoelectronics sector. CreaPhys also develops and produces purifying systems for used organic substances.



RESEARCH

■ The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** is Europe's leading center for the development and pilot production of devices and manufacturing technologies based on organic semiconductor materials. The institute's activities include the full service spectrum ranging from system design to technological development all the way to the pilot production of small batches including substrate structuring, OLED deposition technology, encapsulation, and system integration.

■ The **Institute of Applied Photophysics (IAPP) at the Dresden University of Technology** has extensive expertise in the analysis of physical properties of organic materials and their application in such components as OLEDs and solar cells. A special research focus is on doping highly efficient organic components with the help of doped molecular materials. This has allowed the institute to actually earn several world records in the efficiency of OLEDs and organic solar cells.

■ The **Institute for Print and Media Technology at Chemnitz University of Technology** is a leading research institution in the printed functionalities and printed electronics sector. In addition to conventional printing procedures, digital production procedures (drop-on-demand piezo inkjet at a lab and industrial scale) are also used for the production of printed functional layers. The researchers also conduct and evaluate runnability tests of functional inks and pastes as well as printability tests are carried out on the most diverse materials. The developments of the institute include, for example, loudspeakers and solar cells printed on standard paper.



NETWORKS

■ The **Organic Electronics Saxony (OES)** innovation network represents the interests of Europe's leading cluster for organic, flexible and printed electronics, and thereby unites the key research and industry stakeholders in Saxony. Its declared strategic goal is to act as a driving force to further develop technology for the purpose of consolidating and gradually extending the know-how leadership of Saxony in a dynamically managed worldwide competition. **"EInnovation"** is a European initiative, in which OES, together with 31 partners, is keen on developing and commercializing the technological potentials of organic electronics as well as nano-electronics / microelectronics. **"OES-international"** is the name of the project, in which from 2016 on the OES stakeholders – in close collaboration with Japanese and British technology leaders – will develop organic and printed components to product maturity in Germany. The aim is to achieve the highest level of quality to be able to find applications in the automobile manufacturing, medical engineering and other industries.



www.oes-net.de

■ The network **Silicon Saxony e. V.** with its 320 members from the fields of micro- and nano-electronics, software, applications, smart systems and energy systems, is the largest and most successful industrial association of its kind in Europe. With its objective of strengthening the economic region of Saxony as an ICT location on a sustainable basis, the association perceives itself as a communication and cooperation platform for its members. Silicon Saxony is also part of the **"Silicon Europe"** Alliance – a consortium of the leading micro- and nano-electronics regions in Europe.



www.silicon-saxony.de



SAXONY ECONOMIC DEVELOPMENT CORPORATION

WE OFFER

- the latest data on Saxony's economy and business environment,
- customized service packages for business site selection,
- procurement of contacts with regional decision makers,
- information on opportunities for financial support and subsidy programs,
- access to branch networks in Saxony,
- assistance in opening up new markets, and
- in initiating cooperative partnerships.

WHAT CAN WE DO FOR YOU?

Wirtschaftsförderung Sachsen GmbH (Saxony Economic Development Corporation)

Bertolt-Brecht-Allee 22

01309 Dresden, Germany

Phone +49-351-2138 0

Fax +49-351-2138 399

info@wfs.saxony.de

www.wfs.saxony.de

WWW.INVEST-IN-SAXONY.COM

Photos: 3D-Micromac AG; CreaPhys GmbH; dresden elektronik verkehrstechnik gmbh; Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP / photo: Jürgen Lösel; GLOBALFOUNDRIES; Heliatek GmbH / photographer: Tim Deussen; Institute of Applied Photophysics (IAPP) / Dresden University of Technology; NovaLED GmbH; Plastic Logic; Professorship Print Media Technology / Chemnitz University of Technology; Solarion AG; VON ARDENNE GmbH