Organic Electronics Saxony

Competence Overview

2020
Value Chain

INDUSTRIAL DEVELOPMENT & PRODUCTION

MATERIALS

PROCESS INTEGRATION & SERVICES

PRODUCTION TECHNOLOGIES

APPLICATIONS

BASIC & APPLIED RESEARCH
Our members

1. 3D-Micromac
2. 3DMA
3. Accomplast
4. Adenso
5. adSphere
6. Contronix
7. CreaPhys
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19. Heraeus Deutschland
21. Institute for Electronics Packaging and Assembly Technology (IAVT), TU Dresden
22. Institute of Semiconductor and Microsystems Technology (IHM), TU Dresden
23. Inuru
24. Institute for Printing, Processing and Packaging (IP3), HTWK Leipzig
25. Leibniz-Institut of Polymer Research Dresden (IPF)
26. Institute of Textile Machinery and High Performance Material Technology (ITM), TU Dresden
27. Kurt J. Lesker Company
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41. watttron
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3D-Micromac is the leading specialist in laser micromachining. Our team of experts develops processes, machinery and complete systems at the highest technical and technological level. 3D-Micromac systems have been successfully implemented in various high-tech industries worldwide including photovoltaic, semiconductor, glass and display industries, micro diagnostics, and medical technology. Our target is to completely satisfy customer demands even on the most complex projects.

We commit ourselves to research projects with international partners to bring forward technology competence and product diversity to serve the needs of our customers.

Core competences:
- Laser processes like cutting, dicing, drilling, sintering, scribing, patterning etc. (incl. roll-to-roll capability)
- Process development
- System engineering

The core competence of 3DMA lies in the development & production of premium products, manufactured from a wood composite called 3DMA, in which flexible electronics (sensors, displays, lighting etc.) are integrated (e.g. interactive design objects, electronic devices, modules, housings & control elements made of wood). The company offers design, prototype construction, individual pieces and finished series in one manufactory. Current target markets are luxury jets, yachts and exclusive interior design for private and business purposes.

Core Competences:
- Composite wood materials
- Prototype development
- Intelligent, functional, smart wood surfaces
ACCOMPLAST GmbH
www.accomplast.de

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Germany

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+49 3722 630130

ACCOMPLAST has become firmly established as an important supplier to the automotive and electronic markets as a result of its focus on reliability, individuality, high quality and innovation.

Our wide spectrum of technologies is based around plastic injection molding (1K/2K) and include state-of-the-art surface finishing and fully automatic assembly systems. We manufacture and maintain most of the tools in-house. Furthermore, we design and engineer fully automated systems for assembly of plastic and metal parts and effectively integrate them into our production.

Core Competences:
- Injection molding
- Custom engineering of fully automated assembly systems
- Surface finish using painting and laser marking, PVD coating and vacuum metallization

Adenso GmbH
www.adenso.solutions

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OT Boxorf/Dresden
01468 Moritzburg
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Uwe Beier, CEO
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Adenso business units and core competencies:
Wafer Handling Robots: www.waferhandling.solutions
adControl Cluster.Platform: www.adControl.solutions
R2R winding systems: www.R2R.solutions
Automation: www.automating.solutions

With the adControl Robot.Platform our customers can easily and safely configure their own cluster systems: flexible, versatile and delivered fast!

Core Products:
- WHR wafer handling robots
- FOUP300 VAC LoadPort
- R2R winding systems
- UTG processing solutions
- DTS device tester sorter
- Stealth.Carrier
- Assembly lines
- adControl Cluster Control
Based on its competences and special technologies in functional layers, lamination technologies, substrate handling, and confectioning, adSphere develops new business models for large area and flexible sensor solutions for the market of tomorrow.

Core Technologies:
- Substrate handling
- Laminating technologies
- Functional sensor layers
- Sealing technologies

Core Products:
- adSphere.Controller
- Flexglass.Sensor

Founded in 2003, Contronix GmbH develops application-specific electronic assemblies for a wide range of customers. In addition to the focus on the use of state-of-the-art components in particularly compact designs, one of Contronix’s focal points is the strongly mechanic-integrated electronic development, which is enabled by the use of modern EDA development software coupled with a mechanically dimensionally accurate library of all electronic components. Our circuit boards fit into the housing – at the first attempt. Of course, EMC-compliant PCB layout is just as important as seamless production transfer and support. In addition to customers from classic industry and universities, Contronix develops complete electronic concepts for several innovative start-ups. Target quantities range from individual sample assemblies to cost-optimized products suitable for large-scale production.

Core Competences:
- **Simulation** for critical components, antennas, high-power applications
- **Development** of PCBs with > 10 years of experience and extended library
- **Software development** for firmware of integrated electronic systems
- **Tools** like versioning systems and in-house workshop
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| **CreaPhys** was founded in 1999 as a spin-off from Dresden University and became a member of the M. Braun group 2016. CreaPhys provides customized solutions in the field of thin film electronics for R&D and production scale worldwide. Within the M. Braun group, known as a provider for coating solutions and inert gas systems, CreaPhys acts as a center of competence for thin film deposition. Our portfolio ranges from single components, like deposition sources for molecular compounds (linear sources) and metals to entire customized vacuum deposition systems (e.g. cluster tools). In addition, we offer purification services for molecular compounds, purification tools for R&D or production scale as well as molecular compounds at opto-electronic grade (> 99.99%). Our proprietary QUANTIpure® technology allows the cost-efficient purification of large volumes at high throughputs for batches of multiple kilograms.  
Core competences:  
- Vacuum equipment for thin film deposition (evaporators to full systems)  
- (Organic) material purification services and equipment |

| **CREAVAC** is focused on coating of plastic parts. In addition to job coatings, CREAVAC features new vacuum coating technologies including equipment design, construction as well as research and development. Surface finishing of plastic parts includes lacquering and vacuum metallization by PVD technology for decorative coatings, partially transparent IR-reflective layers, solderable coatings, ESD or EMI shielding etc. In addition, CREAVAC provides further technologies, such as laser engraving and tampon printing. In the area of coating equipment, CREAVAC focuses mainly on technologically oriented specialized solutions. We offer vacuum equipment for production and laboratory use with different coating sources like thermal evaporation, E- beam and sputter techniques, PLD or plasma technologies  
Core competences:  
- Job coating  
- EMI/ESD- coating  
- IR-reflective layers  
- Vacuum coating equipment  
- Technology and equipment development |
**Else Kröner-Fresenius Center for Digital Health (EKFZ)**

The Else Kröner-Fresenius Center for Digital Health (EKFZ) is a joint interfaculty initiative of the TU Dresden, the Carl Gustav Carus University Hospital Dresden, several Fraunhofer Institutes and the Helmholtz-Zentrum Dresden-Rossendorf. The research center focuses its research activities on innovative medical digital technologies at the direct interface to the patient.

It is initially focusing on the areas of:
- Robotics and Coworking
- Implants, Sensors and Devices
- Connected Care

To develop the topic of digital health in a holistic way, the EKFZ for Digital Health supports Interdisciplinary Innovation Projects (IIPs) that deal with medical technology, health economic aspects and the social impact of digital health technologies.

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**FHR Anlagenbau GmbH**

Founded in 1991, FHR Anlagenbau provides customized vacuum coating equipment and sputter targets as well as coating and equipment services from a single expert source.

We support our customers in close contact starting from process development via R&D scale to mass production. Our portfolio combines technologies as sputtering, evaporation, PECVD and ALD with the tool types cluster, inline, roll-to-roll and box. Based in Germany, with tools installed worldwide in various branches such as semiconductor, MEMS, electronic, sensor, optic, display, photovoltaic and more industries, we are ready to support you wherever you want to go.

**Core competences:**
- Customized vacuum coating equipment
- Cluster, inline, roll-to-roll and box
- Sputtering, evaporation, PECVD and ALD
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| **Fraunhofer ENAS**  
Fraunhofer Institute for Electronic Nano Systems ENAS  
www.enas.fraunhofer.de | The particular strength of the **Fraunhofer Institute for Electronic Nano Systems ENAS** lies in the development of smart systems for various applications. These systems combine electronic components with nano and micro sensors as well as actuators, communication units and self-sufficient power supply. Fraunhofer ENAS develops single components, manufacturing technologies and system concepts, system integration technologies and transfers them into production. Fraunhofer ENAS defines the focus of the technology portfolio and the market activities of the institute with its **five business units:**  
- Technologies and Systems for Smart Power and Mobility  
- Technologies and Systems for Smart Health  
- Technologies and Systems for Smart Production  
- Micro and Nanoelectronics  
- Sensor and Actuator Systems  
One of the ENAS core competency is the **development of printed hybrid and flexible electronics applications** like sensors, antennas, batteries, conductive paths and smart systems. |

| **Fraunhofer FEP**  
Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP  
www.fep.fraunhofer.de | 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, plasma-activated deposition and 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 micro displays, organic and inorganic sensors, optical filters and flexible OLED lighting.  
**Core Competences:**  
- Roll-to-roll vacuum deposition of organic and inorganic thin films  
- Roll-to-roll OLED pilot manufacturing incl. encapsulation  
- Polymer substrates as well as ultra-thin glass and stainless steel foil  
- Evaluation of new materials: substrates, adhesives, printed pastes and encapsulation foils for flexible organic application  
- OLED-, Ca-, storage- (climatic chamber, nitrogen or ambient) and lifetime tests can be used |
As a research and technology service provider, the **Fraunhofer Institute for Ceramic Technologies and Systems IKTS** develops advanced high-performance ceramic materials, industrial manufacturing processes as well as prototype components and systems in complete production lines up to pilot-plant scale. The institute operates in nine market-oriented business divisions in order to demonstrate and qualify ceramic technologies and components as well as non-destructive testing methods for new industries, product concepts and markets within and beyond the established fields of application: Materials and Processes, Mechanical and Automotive Engineering, Electronics and Microsystems, Energy, Environmental and Process Engineering, Bio- and Medical Technology, Non-Destructive Testing and Monitoring, Water as well as Materials and Process Analysis.

Flexible substrates made of polymers are used in printed electronics for the architecture of circuits and the integration of microsystems. The temperature resistance, which is limited to a maximum of 200 °C, necessitates the application of low-sintering inks for metallization and functional coatings. As one core competence in this field, the IKTS offers (nano-) suspensions from a variety of materials, such as Ag, Au, Pt, Cu, ITO, CNT or graphene to be applied by screen, inkjet, and aerosol printing and cured by selective laser sintering.

The **Fraunhofer IVV** Branch Lab for Processing Machinery and Packaging Technology Dresden undertakes applied R&D on machine processes. Product safety and efficient processes are our priority. For flexible materials, we develop solutions for efficient thermal joining and intelligent forming. We assist you with the development of cleaning systems, the hygienic design of processes, and the microbiological validation of your processing machinery. We use modern data analysis methods to analyse and improve your processes and realize innovative approaches for industry 4.0.

**Core competences for 3D electronics:**
- Precise thermoforming using forming air stream impact technology and cera2heat® (more homogeneous material distribution upon forming)
- Versatile thermoforming test rig with various forming and heating methods (pressure/vacuum, contact/radiation heating)
- Several analysis and measurement instruments (wall thickness and geometry measurement gauge, infrared and high-speed camera, etc.)
- Analysis and parameterization of the forming processes and formed parts using numerical simulation
- Use of artificial intelligence for the realization of adaptive processes
The **Fraunhofer Institute for Material and Beam Technology IWS Dresden** is characterized by two overlapping work areas: laser technology and surface technology. The development of technologies and systems using tailor-made laser light and the production of functional surfaces are exciting fields of research with great prospects for the future.

In the field of flexible electronics, Fh IWS has developed laser processes for cutting of plastic substrates as well as structuring of thin functional layers. Furthermore, Fh IWS has profound knowledge in additive manufacturing and printing, e.g. for thermoelectric generators or piezoelectric sensors. Finally, Fh IWS develops technologies for evaluation of ultra-barrier materials for organic electronics.

**Core Competences:**
- Ablation and Cutting
- Microtechnology
- Joining
- Thermal Surface Technology
- Additive Manufacturing and Printing
- Chemical Surface Technology
- PVD and Nanotechnology
- Materials Characterization and Testing

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**Fraunhofer IZM** helps companies assemble robust and reliable electronic systems and integrate these into the application environment.

We work on
- Wafer Level System Integration
- System Integration & Interconnection Technologies
- Environmental & Reliability Engineering
- RF & Smart Sensor Systems

Main target areas are automotive, healthcare, industrial electronics and textile electronics.

**Core competences in flexible technologies:**
- Printing
- Bonding & Assembly
- Testing
- Stretchable electronics
- Thermoforming
- Electronic textiles

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**Fraunhofer Institute for Material and Beam Technology IWS Dresden**

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**Fraunhofer Institute for Reliability and Microintegration IZM**

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Freudenberg Industrie Siebdruck GmbH offers a wide range of capabilities in screen printing and uses printed electronics to realize industrial applications. The wide range of customer products is enriched by individual customer solutions, which are developed together with the customer.

Core technologies:
- Screen Printing
- Printed Housings
- Laser technology

Core products:
- Flexible Membrane Keyboards
- Touch Sensors
- Sensor Technology
- Cover Films
- Pick and Place
- Final Assembly
- Cover Plates
- Housings
- Printed Electronics

As the technology leader in organic photovoltaics, Heliatek develops, produces and distributes industrial-grade organic PV solar solutions for virtually any building surface (horizontal, vertical, curved, rigid, and flexible). Heliatek stands for energy solutions designed for various traditional and never been possible before applications based on its unique features – it is ultra-light, flexible and truly green. HeliaSol® is a ready-to-use solution, ideal for retrofitting on existing building structures. HeliaFilm® is tailor-made solar film for companies in the building and construction material industry, to integrate into their façade or roof system products. Heliatek currently employs about 160 people at the Dresden and Ulm locations in Germany.

Core competences:
- Material and product development of organic solar films
- Development of a roll-to-roll production process for the production of organic solar films
- Sales and business development of innovative solar solutions
**Heraeus** is headquartered in Hanau, Germany. Heraeus is an international family-owned company formed in 1851. With expertise, a focus on innovations, operational excellence and an entrepreneurial leadership, we strive to continuously improve the businesses of our customers around the world.

Heraeus is the leading supplier of the intrinsically conductive polymer PEDOT/PSS. This polyelectrolyte complex based on a substituted polythiophene offers the highest conductivity found in a commercial product: 1000 S/cm. Clevios™ PEDOT/PSS is used in polymer capacitors, antistatics, organic light emitting diodes and printed electronics.

Within the Technische Universität Dresden, the **Dresden Integrated Center for Applied Physics and Photonic Materials (IAPP)** is an interdisciplinary research network for organic electronics, especially OLED, OPV, OTFT, organic lasers, organic sensors, bioelectronics and related devices and technologies. Strong competences in research on basic phenomena like charge transport, organic doping or device concepts build the basis for future developments. The IAPP covers the full bandwidth of important topics: synthesis of (organic) materials, alternative electrodes, basic research and new effects, electrical, optical and morphological analyses, device fabrication and test as well as lifetime and controlled aging.

The IAPP consists of five chairs around flexible and organic electronics:

- Prof. Dr. Karl Leo, chair for optoelectronics
- Prof. Dr. Sebastian Reineke, chair for organic semiconductors
- Prof. Dr. Xinliang Feng, chair for molecular functional materials
- Prof. Dr. Stefan Mannsfeld, chair for organic devices
- Prof. Dr. Yana Vaynzof, chair for novel electronic technology
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<td><strong>Institute for Electronics Packaging and Assembly Technology (IAVT)</strong>&lt;br&gt;www.avt.et.tu-dresden.de</td>
<td>Together with the Center for Microtechnical Production (ZµP), the <strong>Institute for Electronics Packaging and Assembly Technology (IAVT)</strong> forms one of the largest university research institutions for electronic packaging in Germany. <strong>Core topics in research:</strong>&lt;br&gt;- Bio-compatible electronic packaging&lt;br&gt;- Organic and inorganic substrate technologies&lt;br&gt;- Assembling technologies for first-level- and second-level interconnects&lt;br&gt;- Micro and nano materials for system integration&lt;br&gt;- Process optimization and quality management&lt;br&gt;- Development of sensors for non-destructive testing and structural health monitoring&lt;br&gt;- 3D integration and optical interconnect technologies&lt;br&gt;- Module reliability and material parameters of interconnect materials&lt;br&gt;- Characterization and diagnostics in electronics packaging&lt;br&gt;IAVT/ZµP has further profound knowledge in rigid-flex connections for flexible and printed electronics.</td>
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<td><strong>Institute of Semiconductor and Microsystems Technology (IHM)</strong>&lt;br&gt;<a href="http://tu-dresden.de/ing/elektrotechnik/ihm">http://tu-dresden.de/ing/elektrotechnik/ihm</a></td>
<td>The <strong>Institute of Semiconductor and Microsystems Technology</strong> was founded in 1990 at the Faculty of Electrical Engineering of the Technische Universität Dresden. It unites four professorships, which perform teaching and research tasks in the fields of semiconductor technology, Microsystems technology, optoelectronic components and systems and nanoelectronic materials. The research at the chair of Microsystems technology contains the following <strong>core topics:</strong>&lt;br&gt;- Microfluidics&lt;br&gt;- Unconventional chemical computing&lt;br&gt;- Silicon-based Microsystems for medicine, life sciences, cyberphysical systems&lt;br&gt;- Organic and polymeric Microsystems&lt;br&gt;- Autonomous smart Microsystems&lt;br&gt;- Microsystems for displays and optics&lt;br&gt;- Sensor systems (plasmonic and magnetic micro and nanotransducers etc.)&lt;br&gt;- Next generation human-machine interfaces&lt;br&gt;- Organic and printed electronics&lt;br&gt;- Smart materials and technologies</td>
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Inuru is a company specialized in organic light emitting diodes used e.g. in animated advertisement. Paper-like OLED light sources are eco-friendly and flexible with printed electronics!

Advantages:
- animated advertising with 8 x higher visibility than classical ads
- advertisement on paper, but with light inside
- thin and flexible
- easy to integrate
- ready to use: no plugs, cables or smartphones needed

Core Competences:
- Functional ink development
- Printed OLED devices
- Paper based products like business cards, magazine inlays etc.
- Full assembly including power supply, electronic wiring etc.

The Institute for Printing, Processing and Packaging (iP3) at the Hochschule für Technik, Wirtschaft und Kultur (HTWK) Leipzig acts at the crossing between industry and research with market-oriented topics ranging from graphics products to functional coatings and packaging.

Packaging cannot be virtualized, but will continue to be produced in the future through printing and processing processes. Nevertheless, digital printing brings about major changes, such as automation or digitization of all process stages. In addition, printing processes are increasingly being used for electronic applications.

iP³ Leipzig also sees itself as a service provider in the network of research, industry and teaching. Our professional competence and modern technical equipment enable independent measurement and testing, application-oriented R&D, consulting and further training.

The research fields include:
- 3D surface structures in the printing and packaging industry
- Interaction and migration in packaging and between packaging and content
- Printed functionalities and intelligent packaging
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| **The Leibniz Institute of Polymer Research Dresden (IPF)** is one of the largest polymer research facilities in Germany. The focus of activities at the IPF lies on the advancement of basic scientific knowledge for the development of functional polymer materials and polymer materials with new or improved characteristics for medicine, transport and mobility, as well as energy efficiency and advanced communication technologies. The institute’s profile is determined by four strategic areas:  
- Functional nanostructured interfaces and polymer systems  
- Biology-inspired interface and material design  
- Polymer networks and supramolecular structures  
- Process-controlled structure formation in polymer materials  

**Core tools** for our work in those areas are  
- synthesis and modification of polymer materials  
- theoretical penetration, processing, and testing  
- polymers and polymer hybrids for organic electronics devices  
- controlling characteristics of polymer materials, biomaterials, and composites by selective interface design |

| Institute of Textile Machinery and High Performance Material Technology (ITM) is a world leading research institution, and is one of the most powerful of Technische Universität Dresden. Among other things, the ITM carries out extensive research and development work on the combination of technical textiles and Microsystems technology, which leads to an interactive data and information medium and to the realisation of sensor and actuator networks. Fields of application include the following high-tech applications:  
- Structural monitoring and vibration damping of composites  
- Medical textiles (wound monitoring, artificial muscles, implant monitoring)  
- Human-machine interaction (CeTi cluster of excellence: eGloves, eSuits)  
In addition, ITM has extensive expertise in the development of tailor-made functional materials and textiles as well as in the development of fibre-based sensor and actuator systems, including layout design on demand. The core competences include the functionalisation of textile materials, yarn development, the integration of functions into textile construction processes, the development of intelligent textile structures for elastomer components, the development of construction, bio and medical textiles, etc. |

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| Kurt J. Lesker Company | Kurt J. Lesker Company is a global leader in the design and manufacture of vacuum technology solutions for research and production applications. With our four divisions – Vacuum Mart, Process Equipment, Materials and Manufacturing – we offer the broadest range of products and service solutions in the vacuum industry. From the simplest components to complex vacuum chambers and precision computer-controlled deposition systems, our company works with you to provide solid and economical solutions for all your vacuum research and development needs. We offer over 14,000 products, customized solutions, expert technical support and outstanding customer service to meet your needs. **Core Competences:**  
  - High-quality vacuum equipment for R&D and production  
  - Largest stock of vacuum parts in Europe  
  - Materials center  
  - Superior customer service |
| Papierfabrik Louisenthal GmbH | Papierfabrik Louisenthal is a leading manufacturer of banknote substrates, security papers and security features. Louisenthal's portfolio includes security paper, security threads and strips for banknotes with high durability requirements. The processes used for high-tech films and papers also offer added value for other industries and applications such as automotive, energy and smart living. For flexible electronics, Louisenthal has developed a production-ready process for the manufacture of highly transparent, durable, conductive and flexible films. Applications are heating, LED films, smart windows, flexible displays, etc. **Core competencies:**  
  - Efficient R2R processes in the areas of  
    - NIL (nano imprint lithography)  
    - dry and wet coating  
    - precise and high-resolution partial demetallization  
    - printing and coating  
    - lamination of different materials  
    - 100% inline control  
  - Independent research and development guarantees customer-oriented and efficient development. |
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| **Life Science Inkubator Sachsen**  
**Project Smart Nanotubes**  
[www.lsi-sachsen.de/projekte/projektdetails/smartnanotubes](http://www.lsi-sachsen.de/projekte/projektdetails/smartnanotubes)  
**Address:**  
TGZ Freital  
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01705 Freital  
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**Contact:**  
Dr. Viktor Bezugly  
v.bezugly@life-science-inkubator.de  
+49 351 85073684  
*The Team **SmartNanotubes** has developed a process for the production of semiconducting single-walled carbon nanotubes (SWCNTs) with unmet quality and purity. Carbon nanotubes possess excellent electronic and structural properties: they are very small and extremely stable. They have a huge potential in a variety of applications ranging from sensors to computer chips. During the running incubator period, the SmartNanotubes team will optimize and scale-up the process from laboratory-scale towards industrial requirements, and test the product in biosensors in the first prototype applications. SmartNanotubes will establish itself as a key supplier for industrial customers from various branches like biosensor and gas sensor manufacturers, nanomedicine and semiconducting industry.***  
**Core Competence:** Production of semiconducting SWCNTs |
| **Novaled GmbH**  
[www.novaled.com](http://www.novaled.com)  
**Address:**  
Elisabeth-Boer-Str. 9  
01099 Dresden  
Germany  
**Contact:**  
Gerd Günther  
info@novaled.com  
+49 351 79890100  
*Novaled GmbH is a leader in research, development and commercialization of technologies and materials that enhance the performance of OLEDs (organic light-emitting diodes) and other organic electronics. Novaled offers OLED product manufacturers a unique combination of proprietary technology, materials and expertise, and is currently the only company in the OLED industry licensing and selling organic conductivity doping technology and materials for use in the commercial mass production of display products. Novaled has developed strategic partnerships with key OLED innovators and producers throughout the world and, with a broad portfolio of more than 500 patents granted or pending, has a strong IP position in OLED technologies, structures and materials.***  
**Core Competences:** Materials for OLED applications (dopants, transport materials, emitters) |
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<td>OrelTech GmbH</td>
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<td><strong>Contact person:</strong></td>
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<td>+49 1726279473</td>
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ORELTECH is a trailblazer in the field of new metallization inks and is focused on R&D of new technologies for printing thin functional metal coatings. These inks can be easily printed on a variety of substrates including plastic, paper, textiles, ceramics, transparent substrates and 3D structures.

ORELTECH inks do not contain nanoparticles, are significantly environmentally friendlier and more cost-effective than the alternatives. This technology utilizes inkjet/aerosol printing and other conventional printing methods as well as cold plasma for curing. This allows keeping the process temperature at <70°C and working with even the most sensitive substrates. ORELTECH offer functional metal-based inks for different applications and assistance in integration of metallization technology into customer’s production line.

**Core competences:**
- Functional metal-based inks
- R&D for custom products

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<td>Bernd Zimmermann</td>
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<td><a href="mailto:bernd.zimmermann@plasticlogic.com">bernd.zimmermann@plasticlogic.com</a></td>
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PL Germany has successfully industrialized the production process for flexible electrophoretic displays. As such, Plastic Logic is the world leader in the development, manufacture and sale of such devices. Using a stable and proven transistor platform technology, the company manufactures an extensive range of high quality flexible plastic displays in both low and high volumes under an exclusive license agreement. These shatterproof, malleable, daylight readable displays are ultra-thin, lightweight and extremely energy efficient and offer enormous advantages over conventional displays as they are extremely robust and durable. Plastic Logic Germany’s customers include original equipment and electronics manufacturers for signage and logistics, mobile electronics, smart cards, wearables and more.

**Core Competences:**
- Production of thin, flexible, high-res organic transistor backplanes
- Fabrication of flexible b&w and colour EPD Displays for e-readers, IoT applications, jewelry, mobile/off-grid applications etc.
The Institute for Print and Media Technology at the TU Chemnitz is specialized on printing technologies and printed electronics applications. The pmTUC covers all printing processes from gravure printing to inkjet, in machine design as well as in processing. A lot of different application fields are addressed, like organic photovoltaics, sensors, memristor, printed loudspeakers, energy storage and more.

**Core Competences:**
- Printed functionalities and devices
- Semi-industrial laboratory printing equipment

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Prismade is a technology developer, focusing exclusively on interactive high security applications. With conventional printing methods, prismade embeds secure, electronic identification tags in everyday paper products creating unexpected and disruptive product features for many industries. Their interactive ID technologies are more secure than optical recognition systems and available at lower cost than RFID and NFC. The smart tags are suitable for secure and interactive packaging for customer information and brand protection, smart payment, smart interaction and others. Prismade is licensing this interactive technology to solution providers and manufacturers.

**Core Competence:** Printed identification tags for integration in print products for brand protection and other security applications
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<th>Partner</th>
<th>Competences</th>
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| **ROVAK GmbH**          | Since 2002, **ROVAK** offers services and products around vacuum technology equipment. **ROVAK** cooperates intensively with research institutes, universities and high-tech start-ups in order to stay tuned to the latest developments in vacuum technology. This advantage in knowledge enables us to provide to our customers customized vacuum systems and optimal advice. **ROVAK** is characterised by a very high vertical range of manufacture for the industry, with flexibility towards individual requirements. The portfolio is extended by experience in thin film technology, especially flash lamp annealing. **Core Competences:**  
  - Vacuum pumps, vacuum pumping stations  
  - Vacuum chambers and container construction  
  - Mechanical engineering, special solutions & engineering  
  - Equipment for flash lamp annealing  
  - Mechanical processing |

| **SEMPA SYSTEMS GmbH**  | **SEMPA SYSTEMS** develops, produces and sells ultra-purity media systems and ready-to-use solutions for specialty gases and chemicals for the semiconductor, photovoltaics, electronics and glass fiber industry. **Core Competences:**  
  - Bulk and special gas distribution systems  
  - Chemical supply systems in stainless steel  
  - Control software and automation of our systems  
  - Customer-specific development projects  
  - Asian representation by local partners  
  Some examples are TMAI and ozone systems for AlOx backside passivation or supply systems for IGZO residues. |
|                         | **WVTR measurement**  
  In cooperation with Fraunhofer IWS, we developed the HiBarSens© system for ultra-high precision measurements of the water-vapor permeation through ultra-barriers, like used for organic electronics applications. |
The **Senorics GmbH** is a high-tech spin-off of the Dresden Integrated Center for Applied Physics and Photonic Materials (IAFF) of the TU Dresden. Senorics develops optical sensor technology for visible and near-infrared spectroscopy (NIRS) that enables the detection of ingredients and contaminants in many areas of modern life and work. The detector chip itself takes the function of the spectrometer, further optical elements are not necessary. The technology is based on organic semiconductors, is inexpensive, powerful and can be miniaturized. The detector is customized to a specific measurement task. Typical application areas are breweries, smart farming, packaging, predictive maintenance, plastics processing and others.

**Core Competences:**

- Near-infrared spectroscopy optical sensor technology
- In-house chip design and fabrication
- Detector customization to specific measurement task

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**SUNIC SYSTEM** supplies OLED evaporation systems along the whole value chain from R&D to mass production. The main system is the G6H Mass Production Line, which has been successfully installed and operated in customer sites for several years. Furthermore, SUNIC has been involved in the pilot production market with G2.5 for PM & OLED Lighting during the last 10 years and finally achieved Market Share No. 1 worldwide with pilot systems.

In addition, since the beginning of OLED industry, SUNIC has contributed to the development of this industry with R&D equipment for more than 20 years and achieved Market Share No. 1 with standard R&D equipment among OLED material suppliers. Recently, SUNIC entered a new challenging field, which is microdisplays for applications such as VR/AR and already installed several systems for mass production both for 200mm and 300mm based wafer sizes for market leading manufacturers in China.

SUNIC has particular strength not only in fabrication equipment, but is also known among all customers for its excellent customer service experience.
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| SYNTHON Chemicals GmbH & CO. KG | SYNTHON Chemicals GmbH & CO. KG is an ISO9001 certified owner-managed producer of speciality and fine chemicals. The company has modern production facilities, laboratories, warehouses and offices with a total area of 2000 square meters. The company has a highly qualified staff of chemists, plant operators, laboratory technicians and engineers, and has extensive experience in the development of multi-step syntheses of organic compounds. SYNTHON Chemicals supplies the industry with high-quality final products and intermediate products in quantities ranging from a few grams to several hundred kilograms. The company’s core competence lies in the following product groups:  
- Dyes and fluorescent dyes for high-tech applications  
- Liquid crystals for electro-optical displays  
- Reactive mesogens for display technology and security applications  
- Heterocyclic compounds as intermediates for bioactive compounds  
- Materials for organic electronics  
- Fine chemicals for R&D and small-scale production plants  
- Medical devices  
- Photoinitiators  
- Custom syntheses |
| TES Frontdesign GmbH | TES Frontdesign is one of the leading suppliers of individual machine user interfaces in Germany. The company offers the full service and engineering chain from customer-specific foil-based keypads up to complete interfaces including housing and assembly of electronic components with special focus on small and medium quantities. The core competence is complete manufacturing with a high production depth at a single location as unique feature. We continuously increase our market share in our three focus areas: foil keypads, housing solutions, and components assembly.  
**Core competences:**  
- Customer specific foil keypads and touch input systems  
- Screen printing, Laser cutting  
- Front panels based on aluminum, PCBs, stainless steal  
- Electronics assembly, printed electronics  
- Stainless steel housings including surface finish  
- Glass processing |
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watttron’s patented technology is both simple and ingenious: The heating circuits of the small dynamic matrix heating elements are screen-printed on thin ceramic plates allowing for custom designed heating circuit layouts that are both simple and efficient. The combination of a low thermal mass and a high thermal stability allow high resolution and ultra-dynamic customized heating patterns. Integrated sensors close to the heating circuits ensure precise monitoring of the surface temperature during the entire process.

The heating technology serve different industries and sectors to make processes more flexible, faster and resource-efficient, in addition to improving time and control.

Core Competences:
- Design and layout of the temperature field
- Production of the heating system
- Installation and initial operation supervision

WOLFRAM Designer und Ingenieure is a complete solution design consultancy creating unique success for the industrial and transport sector. Our experienced team consists of engineers and designers, providing services with regard to the entire product development process – from the initial idea in the form of design sketches to the detailed CAD construction of a product right up to mass production. Working together with our customers, we assess the potential and unique selling proposition and define the innovation strategy.

Together with our customers, we create innovations in the fields of industrial goods, automotive design and consumer products. In the field of OLED technologies, WOLFRAM Design/Engineering creates innovative light sculptures using state-of-the-art OLED technology and precious materials, which have never been seen before in light design.

Core Competences:
- innovation research
- conceptualization
- industrial design
- CAD mechanical engineering