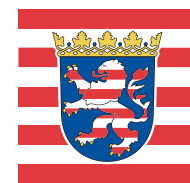


Hessian Ministry of Economics, Transport,
Urban and Regional Development

www.hessen-nanotech.de

HESSSEN



Hessen-Nanotech NEWS

LOPE-C
Large-area,
Organic & Printed Electronics
Convention

June 28 - June 30, 2011
Forum | Messe Frankfurt, Germany

JOIN THE FUTURE!

Meet executives and experts from management, development and science at the premier international marketplace for the Organic and Printed Electronics Industry.

 www.lope-c.com 

LOPE-C 2011 - International Conference and Exhibition on Organic and Printed Electronics

OE-A - International Network for the Organic and Printed Electronics Industry

Companies in Focus:
Coatema Coating Machinery
Pall Corporation
Beneq
3D-Micromac
DuPont Teijin Films

Research in Focus:
CEA / LITEN

Special Edition
for the LOPE-C Convention
hosted by Organic and Printed
Electronics Association (OE-A)

Hessen – there's no way around us.

Hessen

Nanotech

2011
Special

Dear Hessen-Nanotech NEWS Reader,

Editorial



Dieter Posch

Imagine a light source that is energy-efficient and eye-friendly at the same time. No heat radiating hot spot or glaring fluorescent tube. Instead, a cool and smooth light-emitting panel – as large as a wall. Instant-on at full brightness. White, or tuneable to any desired colour. Made of feather-weight organic materials, such as polymers or small molecules, utilized as light emitting diodes (LED). Mass-printed on low-cost plastic substrates so thin and flexible they can be embedded in the surfaces of furniture, windows, ceilings, office machinery or automobiles. In a word: nanotech pure.

OLED lighting, as the new light source is called, is currently being developed by a rapidly emerging high-tech industry based on organic and printed electronics. Some of these futuristic 'luminaires' are already commercially marketed as high-end designer objects. Six or seven years from now, according to the technology roadmap of the OE-A (Organic and Printed Electronics Association), OLED lighting will be universally available as a standard building component.

This is just one prominent example. Next in line are organic solar cells and displays, printed batteries, functionalized textiles, smart packaging to ensure a product's legitimate delivery chain, and much more. Nanotech offers huge economic potential as key enabler of a host of industrial applications and consumer goods. Due to intensive, focused R&D work at large companies and research institutions supported by public funding, Germany is a world leader. The state of Hessen, with Frankfurt as a major financial center and global air transportation hub, is ideally positioned in advanced materials, nano and related leading-edge technologies.

So, it's only appropriate, that OE-A again has chosen Messe Frankfurt for their third 'Large-area, Organic and Printed Electronics Convention' (LOPE-C), jointly organized with Mesago Messe Frankfurt GmbH, as the meeting point and international market place of this exciting future industry. Welcome to Frankfurt!



Wolfgang Mildner

Dieter Posch

Hessian Minister of Economics, Transport, Urban and Regional Development

Wolfgang Mildner

Chairman of the OE-A Board and Managing Director of PolyIC

OE-A - International Network for the Organic and Printed Electronics Industry



www.oe-a.org

The OE-A (Organic and Printed Electronics Association), a working group within the German Engineering Federation (VDMA), was founded in December 2004. The OE-A is the key international industry association for organic and printed electronics and represents the whole value chain of this emerging industry. Its members are leading international companies and R&D institutes, component manufacturers and material suppliers, equipment and tool producers as well as end-users. More than 170 companies from Europe, North America, Asia and Australia are working together within the OE-A to promote the establishment of a competitive production infrastructure for organic and printed electronics.

With this goal in mind, the OE-A organizes working groups on the subjects of applications, technology, quality control, green electronics, up-scaling production, demonstrators, as well as education and training. The OE-A regularly issues an applications and technology roadmap for organic and printed electronics to provide companies, institutes, investors and public authorities with planning guidelines for entrance into this emerging industry. OE-A's vision is to build a bridge between science, technology and applications. The VDMA is the largest industry association in Europe with its more than 3000 member companies from the industrial goods industry.

■ klaus.hecker@vdma.org

LOPE-C 2011

International Conference and Exhibition on Organic and Printed Electronics

For three days, June 28 to 30, 2011, Frankfurt will play host to the organic and printed electronics industry. LOPE-C 2011 (Large-area, Organic and Printed Electronics Convention), will be bigger than ever and is looking forward to: 150+ presentations in the conference, 1000+ international participants and 90+ exhibitors.

Conference and exhibition under one roof is uniting scientists and industrial experts, investors and end-users from around the world to discuss the rapid progress and display the latest applications of an exciting new field that is shaping up as the next wave of high-tech activity.

LOPE-C is the premier platform of the organic and printed electronics community, covering the entire industrial value chain - from academic research to industrial R&D, commercialization to end-user preferences. Main focus of the LOPE-C 2011 exhibition is on applications and devices such as displays and OLED lighting, photovoltaic cells, RFID tags, sensors, batteries, smart systems, as well as materials and processes. LOPE-C 2011 will include live demonstrations of production equipment.

Key aspect of the LOPE-C conference is to inform on the latest scientific progress and expedite the knowledge transfer from lab to marketplace.

Plenary Sessions LOPE-C 2011

- **BMW Group, Germany**
Mr. Robert Isele, Manager Perceived Value
"Flexible Electronics as a Key for a New Experience of Value"
- **Drzaic Consulting Services, USA**
Dr. Paul Drzaic, President
"Where Is My Flexible Display?(!)"
- **Ministry of Knowledge Economy (MKE), Korea**
Dr. Young-Sup Joo, Managing Director
"Global Collaboration Initiatives for the Successful Commercialization of Printed Electronics"
- **OE-A, Germany**
Mr. Wolfgang Mildner, Chairman
"Printed Electronics - Ready to go"
- **Osram Opto Semiconductors GmbH, Germany**
Dr. Karsten Heuser, Director & General Manager OLED
"Ignition sequence starts. OLED Lighting ready for take off?"
- **Samsung Electronics, Korea**
Dr. Jong Min Kim, Vice President of Product Planning Division
"Printable and Flexible Electronics for the Future Applications"
- **University of Tokyo, Japan**
Prof. Takao Someya, Professor
"Ambient electronics using printed organic transistor"



LOPE-C 2011 will offer more than 150 presentations: plenary sessions featuring internationally noted technologists and industry leaders, a business conference, a technical and scientific conference, plus poster sessions, short courses and an investor forum - laid out to gain insight into current developments and future trends in organic and printed electronics.

- Mesago Messe Frankfurt GmbH
astrid.wille@mesago.com

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Mr. Wolfgang Mildner, PolyIC, Managing Director, Germany, and Chairman of the OE-A Board

Exhibition Chair

Thomas Kolbusch, Coatema Coating Machinery GmbH, Vice President, Germany, and Member of the OE-A Board

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Announcement



June 28 - June 30, 2011
Forum Messe Frankfurt, Germany

www.lope-c.com

Major topics:

- Lighting
- Photovoltaics
- Displays
- Materials
- Electronics and Components
- Integrated Smart Systems
- Processes and Production

Coatema Coating Machinery GmbH

The future of large area printed electronics from the perspective of a German machinery building company - a European view

Companies in Focus



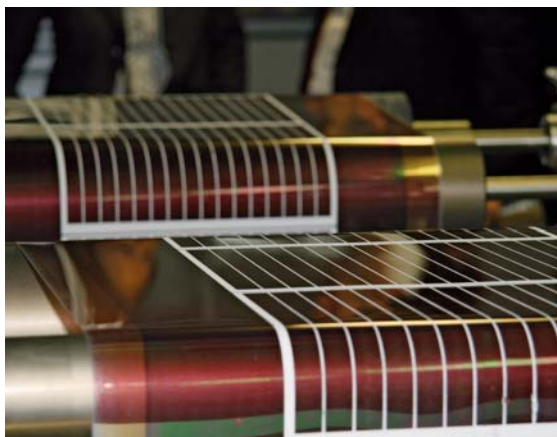
www.coatema.de

The development in Europe for large area printed electronics is now moving from R&D oriented operations to more market driven approaches.



The Smartcoater: Printing Roll-to-Roll on small scale

As a machinery builder which is focused on up-scaling new technologies from R&D to production, Coatema Coating Machinery GmbH is specialised in the new key technologies. With 38 years of experience in the market, Coatema worked and is still working for a number of new high tech areas like lithium-ion batteries, fuel cells and nano materials. Being an SME, the work in EU funded FP7 projects and local German funded projects is essential for entering the new market of printed electronics. In the beginning of the Coatema activities in printed electronics, which was around the year 2000, the company focused on basic coating and printing technologies for mature areas like RFID, solar cells or sen-

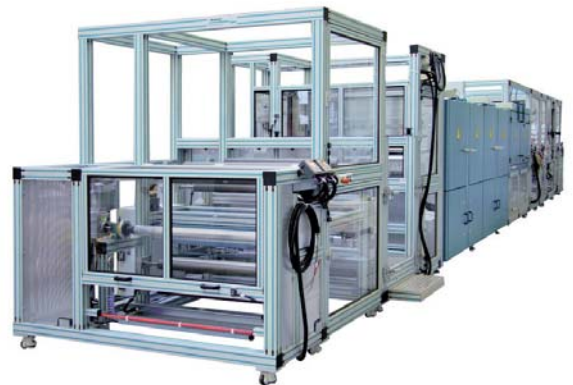


Coating and Printing of organic photovoltaics

sors. Today Coatema is one of the market leaders in supplying equipment in the whole value chain for printed electronics.

This includes coating in nanometer scale thickness, high accuracy registration controlled printing, laser patterning, nano imprinting, hot embossing and new technologies in curing and cross linking of inks. All these basic technologies have to be performed in high accuracy, reproducibility and efficient cost of ownership relation to the respective equipment.

Specific environmental conditions, like clean room and nitrogen atmosphere, are state of the art at Coatema nowadays. The units distributed into the market range from table top operated lab machines to roll-to-roll (R2R) units in 1.000 mm working width for high speed operation. At the moment, Coatema is setting up the biggest European semi production line for Printocent at VTT in Oulu (Finland). This unit features several printing and coating stations and constitutes a benchmark in Europe for this type of operation. Here industrial customers will be empowered to produce printed electronic devices in bigger quantities.



The Click&Coat: Large scale printing and coating

Coatema is also proud to work in the OE-A, which is considered the most important association in the area of large area printed electronics. Together with more than 170 members, roadmaps and demonstrators are developed to show the capability of printed electronics products to the public.

■ Coatema Coating Machinery GmbH
info@coatema.de

Pall Corporation

Filtration, Separation and Purification Solutions
for Printable Electronics Applications

Pall Corporation is the technology leader in the \$48 billion global filtration, separation and purification industry. Pall has become a \$2.4 billion company by solving complex fluid management challenges for diverse customers around the world. We have been called the "original clean technology company" since many of our products deliver sustainable social benefits. With three global regional hubs in New York, Switzerland and Singapore and manufacturing, sales and customer support & service centres in numerous countries within each region our world class infrastructure is well suited to support a global customer base.

At its core Pall is a Materials Engineering company and we apply our vast technology portfolio to many industries including semiconductor fabrication, ink jet printing and display manufacturing. Printable electronics is evolving from these key industries and Pall can leverage significant filtration expertise for these new applications.

Pall offers filtration options for many of the common applications in printable electronics processes. For example classification of dispersions in conductive inks to produce consistent, reliable ink formulations, defect reduction in all critical coating applications and gel removal in UV curable fluids. Our expertise in ultrafiltration crossflow technology is used in fractionation of polymers for improved quality and functionality.



Benchtop crossflow unit for polymer fractionation

For the photovoltaic industry we provide gas purification solutions for thin film photovoltaic cell processing, dye filtration for dye-sensitised solar cells and general high purity chemical, gas and water filtration as well as wastewater recycling for the silicon solar cell market.



Pall Corporation

www.pall.com



Filtration products for printable electronics

In addition, Pall offers the tools to support your entire filtration and purification needs from development through to commercial production. We can provide small disposable filtration devices for laboratory scale development work, through large filter assemblies for bulk manufacture of active components, on to capsule filters designed to protect print heads and provide reliable consistent printing of active devices. Our products and services will allow you to select the correct filtration technology for your need and optimize for maximum performance and economy.

Pall filtration technology will enable faster production, fewer defects and lower overall costs in all the markets that we serve.

We look forward to your filtration challenge!

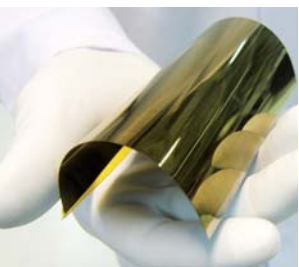
- Pall Corporation
Michael_Mehler@europe.pall.com

Beneq

Coating Equipment for Printed Electronics



www.beneq.com



Polymer substrate coated with continuous ALD in a Beneq TFS 200R

Beneq, a strong player in printed electronics and advanced thin film coating, is supplying global markets with the coating equipment necessary for industrial breakthrough. Beneq turns technical innovations into commercial success by developing applications and equipment for cleantech and renewable energy fields, especially in the glass, solar and emerging thin film markets. Coating applications at present include optics, barriers and passivation layers, as well as energy generation and conservation. Beneq also offers complete coating services. The coating applications of Beneq are based on atomic layer deposition (ALD) and aerosol coating (nHALO® and nAERO®).

Beneq's interests in printed and organic electronics lie in the field of barrier and diffusion preven-

tion layers, deposited by means of ALD. For organic light emitting diodes (OLED), Beneq offers the TFS 200, a R&D tool (can be equipped with glove-box) for reliable thin film encapsulation. Beneq is also developing a new concept for mass-production of high-quality and affordable encapsulation of OLED devices. Furthermore, in 2009 Beneq launched the first commercial tool for applying continuous ALD coatings on flexible substrates. The tool, the TFS 200R, is meant for development R&D of continuous atomic layer deposition (CALD) on flexible substrates, primarily polymer films. Roll-to-roll ALD equipment is under development.

■ Beneq Oy
mikko.soderlund@beneq.com

CEA / LITEN

Printed Organic Electronics for Integrated Smart Systems

Research in Focus



<http://www-liten.cea.fr>

CEA / LITEN (Laboratory for Innovation in New Energies Technologies and Nanomaterials), a major Research and Technology Organisation in Grenoble, France, is strongly committed to provide industry with processes for printed organic electronics. According to our vision, Organic and Large Area Electronics (OLAE) is a new level in the electronic chain (silicon chip, printed circuit board, flexible circuit board etc.) that allows new design and new system partitions to create breakthrough in products innovations. Our research focuses on developing printed electronic functions: passive devices, CMOS, sensors, OLED, batteries and OPV, and on integrating them into Smart Systems (interconnection and hybridisation,

integration of models into EDA - Electronic Design Automation - circuit design tools).

CEA / LITEN recently launched PICTIC the French large area (320 mm x 380 mm) Sheet-to-Sheet printing platform: it gathers in a 600 m² clean-room printing equipments (inkjet and spray, screen printing, gravure printing, laser ablation etc.), to develop new processes, with prototyping capability. Supported by Rhône-Alpes Region and European Funds, in conjunction with the Technical Center for Plastics of Pôle Européen de Plasturgie (PEP), PICTIC is open to equipment suppliers, materials providers, manufacturers, end-users, under the auspices of MINALOGIC "pôle de compétitivité".

Printed organic CMOS circuits developed and produced by CEA / LITEN



As main results, CEA / LITEN already demonstrated a stabilized printed organic CMOS technology, available for circuit design, and in 2010, span off ISORG, a start-up dedicated to printed organic photodetectors.

■ CEA / LITEN
isabelle.chartier@cea.fr

3D-Micromac AG

Laser Machining in the Organic Photovoltaic Industry

The steady growing demand for high yield and mass production of flexible electronic devices requires new production processes. These flexible electronic devices expand more and more into everyday life. Therefore new developments for industrial systems with high throughput need to be combined with extreme low manufacturing costs.

A new technology is the production of printed, flexible solar cells based on organic materials. These new organic photovoltaics can be applied on flexible substrates such as PET foil enabling large-area mass printing techniques in a roll-to-roll environment for the deposition of the several functional layers. This approach allows for a cost-efficient production of organic cells.

The laser structuring of organic solar cells provides additional potential. The ITO (indium tin oxide), organic layers and metal films are a maximum of a few micrometers thick and are selectively ablated using ultrashort pulsed lasers with different wavelengths. These processing methods guarantee a high efficiency of the finished orga-

nic solar cells with minimal material damage and the lowest possible loss of material.



3D-Micromac offers state of the art production equipment for printing and laser technologies which allow a cost-efficient production of organic solar cells and OLEDs. The focus lies in the development and production of innovative turn-key manufacturing lines, starting from the basic materials to the finished encapsulated cells with the following technologies: gravure printing, slot die coating, ink-jet printing, drying, laser structuring and laser annealing.

■ 3D-Micromac AG
info@3d-micromac.com

Company in Focus



First Choice in microMachining

www.3d-micromac.com

microFLEX™ - Reel to reel system for processing of flexible materials

DuPont Teijin Films

Flexible Substrates for Printed Electronics

The DuPont Teijin Films joint venture is a world-leading manufacturer of high performance PET optical films for LCDs and Plasma Display Panels (PDP), as well as PEN stabilised films for flexible electronics and displays.

Melinex® PET Films for Plastic Electronics Applications

The industry's widest range of polyester films for plastic electronics applications, delivering predictable dimensional change and flatness

DuPont Teijin Films offers an extensive portfolio of engineered PET films. The wide range of stabilised films, including newly developed thin films (50 and 75 µm), are strong and flexible with excellent resistance to heat, abrasion, chemicals and moisture.

Teonex® PEN Films for Flexible Displays and Electronics

Surface-engineered, optical quality film for the most demanding flexible display and electronics applications

Teonex® is the substrate of choice for demanding flexible display applications. PEN films provide superior performance, including excellent dimensional control, for applications exposed to extreme heat and harsh chemicals. The new commercially available planarised PEN film from DuPont Teijin Films has a smooth, clean surface that is ideal for ITO sputtering or other optical coatings.

■ DuPont Teijin Films
europe.films@gbr.dupont.com



www.dupontteijinfilms.com



(Source: Courtesy of Flexible Display Center)

Schedule/Events

30.08.2011 Darmstadt

Bionik im Betrieb

Start of a series of events on Bionics/Biomimetics and Nano-/Materials Technology of Aktionslinie Hessen-Nanotech, IHK Darmstadt and the German bionics network BIONIKON

■ www.hessen-nanotech.de/bionik-im-betrieb

10.10.-12.10.2011 Darmstadt

Mikrosystemtechnik-Kongress 2011

Convention on Microsystems Technology of German Federal Ministry of Education and Research and VDE Association for Electrical, Electronic & Information Technologies

■ www.mikrosystemtechnik-kongress.de

09.11.2011 Frankfurt

Hessian/German-Japanese Symposium on "Energy Storage Materials"

Binational Conference of Aktionslinie Hessen-Nanotech and Japan External Trade Organisation JETRO within the framework of "150 Anniversary of Friendship Germany-Japan"

■ info@hessen-nanotech.de

08.05.-10.05.2012 Nuremberg

SMT Hybrid Packaging 2012

International Exhibition & Conference on System Integration in Micro Electronics

■ www.smt-exhibition.com

18.06.-22.06.2012 Frankfurt

ACHEMA 2012

30th World Exhibition Congress on Chemical Engineering, Environmental Protection and Biotechnology

■ www.achema.de

28.06.-30.06.2012 Zurich, Switzerland

Smart Systems Integration 2012

European Conference & Exhibition on Integration Issues of Miniaturized Systems - MEMS, MOEMS, ICs and Electronic Components

■ www.smartsystemsintegration.com

Further information about upcoming events at www.hessen-nanotech.de/Veranstaltungen.

Aktionslinie Hessen-Nanotech

Hessen-Nanotech coordinates the activities of the Hessian Ministry of Economics for the funding of materials technology and nanotechnology enterprises. It is the platform for information, communication and cooperation in materials technology and nanotechnology. You are searching for partners in science and industry or a place to be for doing business in centre of Germany or Europe? Please contact Hessen-Nanotech at LOPE-C or with an E-Mail.

■ info@hessen-nanotech.de



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HA Hessen Agentur GmbH

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