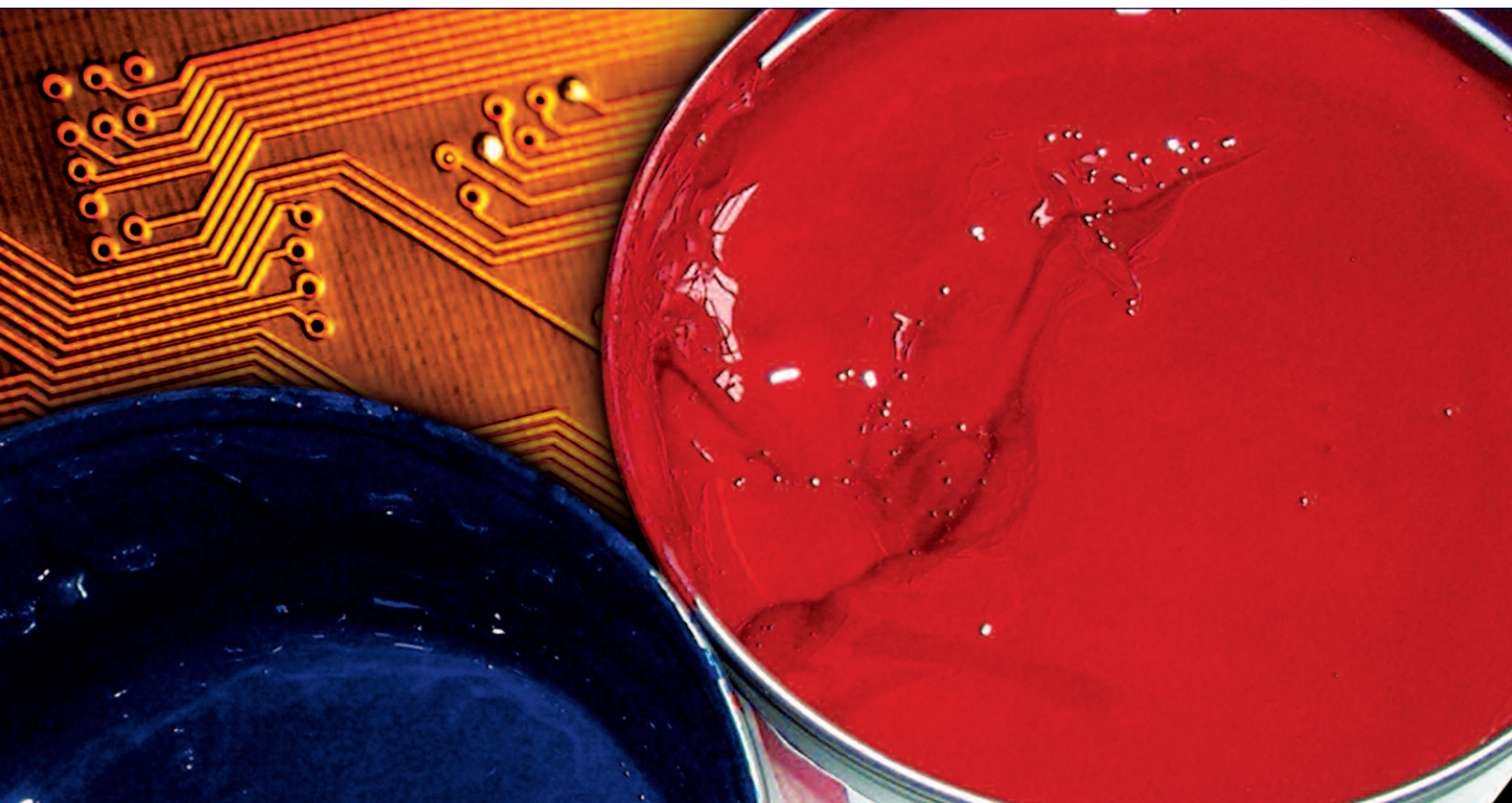




Intelligent Inks

Novel ink technologies to add value to your packaging
Two day Pira International conference plus expert half day workshop



Tuesday 8 and Wednesday 9 November 2005

Renaissance Wien Hotel, Vienna, Austria

**Interactive half day
pre-conference workshop**

Conductive Inks in Packaging Applications

Monday 7 November 2005

Featuring case studies and presentations from:

- | | | |
|--------------------------------------|-----------------------------------|-------------------------------|
| Acreo | Hewlett Packard | Sentient Technologies |
| Cima NanoTech | Identif GmbH | Sherwood |
| Constar International | Mid Sweden University | Simons Druck |
| Cypak AB | Novalia | Solicore |
| Degussa | Optaglio | Sun Chemical |
| DNA Technologies | OxySense | TEMPTIME |
| Emirates Technical Innovation Centre | Parelec | University of Toronto |
| Evident Technologies | Pelikon | Wageningen Research Institute |
| Flint Schmidt Group | Rochester Institute of Technology | Xink |
| Hebrew University of Jerusalem | Sensible Solutions | Z Corporation UK |

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Intelligent Inks

With growth rates estimated at 10-11% per annum* in the security inks sector alone, these are exciting times for the multi million € intelligent inks industry. Sophisticated new products are offering additional functionality for diagnostics, shelf impact and conductive ink applications. Keeping up with cutting edge trends and developments is critical to success.

Pira's second **Intelligent Inks** conference will showcase the very latest product developments and applications in this rapidly growing market. Over two days a line-up of top industry speakers will demonstrate how you can add significant value to your brands and consumers by providing accurate, secure and increasingly interactive product information.

The conference and half day workshop will enable you to access the latest data from leading European and US companies pioneering intelligent ink applications including:

Printed electronics and conductive inks – low cost printed electronics such as printed RFID, low cost power sources and basic displays

Taggants and supply chain tracking devices – low cost solutions to brand protection / authentication as well as RFID-style supply chain tracking

Diagnostics – using inks as sensors to monitor and diagnose pack and product conditions such as oxygen sensors, moisture surveillance and doneness / readiness indicators

Decorative techniques – 3D printing, thermochromic ink applications and scented inks

You'll get the answers to key questions, including:

- What is a realistic cost / benefit analysis for these inks?
- How big is the market?
- How much will consumers be prepared to pay for additional functionality?
- What are the practical realities of integration with existing manufacturing processes?
- How robust and durable are intelligent ink products, especially for decorative and tactile applications?
- What are the current limitations on design of intelligent ink applications and how close are they to being resolved?
- Benchmarking new intelligent ink applications against existing commercially available security, supply chain and diagnostics applications: why invest in these new solutions?

Tuesday 8 November 2005

08.15 Registration and refreshments

09.00 **Opening remarks from the chair: Steve Postle, Director of Technology, SUN CHEMICAL, US**

Enabling communicative packaging through ink technology

09.10 **Emirates case study: printed time temperature indicators (TTI) and biosensors (TTB)**

- Printed TTIs and TTBs in freshness applications
 - The role of ink in producing accurate indicators
 - Market potential and future demand
 - Current technical limitations
 - Future directions and potential breakthroughs
- Amet Kianin, EMIRATES TECHNICAL INNOVATION CENTRE, United Arab Emirates**

09.40 **Providing added value to the consumer with doneness and readiness indicator inks**

- The growing market for microwave and ovenable packaging
- Aiding consumer convenience with intelligent inks
- Assessing the accuracy and robustness of the technology
- Latest advances in ink technology and future possibilities

Ted Prusik, Senior Vice President, TEMPTIME, US

10.10 **Printing and using oxygen sensors**

- Ink innovations for oxygen sensors
- Applications in food, drink and pharmaceuticals
- Assessing the performance and accuracy of printed oxygen sensors

Peter Gerard, CEO, OXYSENSE, US

10.40 Morning refreshments

11.00 **Printed action activated wireless sensors for moisture surveillance**

- Printed sensor elements for incontinence alarms
- Printed moisture sensors in wireless forest fire alarms
- Temperature surveillance in frozen packages using printed sensors
- Characterisation and design examples

Hans-Erik Nilsson, Head of the Electronics Design Division, MID SWEDEN UNIVERSITY and SENSIBLE SOLUTIONS, Sweden

11.30 **Microbial and bacterial sensors**

- Tackling increasing demand for food safety and hygiene through sensors
- The potential for sensors in consumer awareness and safety
- Using intelligent inks to print antibacterial sensors
- Suitable positioning on the packaging for best possible accuracy
- Future market demand and technology directions

Dr. Arie van der Bent, Senior Scientist, WAGENINGEN RESEARCH INSTITUTE, Netherlands

12.00 Lunch will be served for speakers and delegates

Selling packs through increased intelligence

13.10 **Use of electroluminescent (EL) displays on high value packaging**

- Enhancing the appeal of packaging with EL displays
- Technical and commercial considerations: impact on consumer purchasing decisions and assessing ROI for brands

Mike Powell, CEO, PELIKON, UK

13.40 **Improving intelligent packaging through ink innovation**

- Drivers for innovation in the packaging industry
- Latest developments in communicative and interactive packaging
- The role of inks in achieving intelligent packaging
- Cost comparisons for inks and alternative technologies

Tommi Remonen, Manager, Organic Electronics, ACREO, Sweden

14.10 **Achieving electronic tamper detection and questionnaires through conductive inks**

- Using graphite ink for printable circuitry and antennae in computerised packaging
 - Case studies in the pharmaceutical, diagnostic and courier industry
 - Future applications and opportunities
- Stina Ehrensvar, Co-founder and VP Marketing, CYPACK AB, Sweden**

14.40 **Printed electronic applications in the printed card industry**

- Novel applications for conductive inks in printed cards
- Existing commercial examples and potential for technology transfers to packaging
- Combining printed power sources with conductive ink circuits
- Bringing together a fully functional printed electronic greeting card

Nick Stone, Founder, NOVALIA, UK

15.10 Afternoon refreshments

15.30 **New applications for inkjet inks: from standard digital imaging to edible print-outs: an evolving technology**

- Inkjet history and evolution of this technology to new applications
 - From digital imaging printing to a microscope dosing technology
 - Commercial applications, e.g. food inks
- Ramon Casas, Technical Manager, SENTIENT TECHNOLOGIES, Spain**

16.00 **Latest developments in scented inks**

- Scent based inks in packaging and point of sale
- Applications for scented inks in carton based packaging
- Influencing the consumer through aromas: products and applications to achieve the potential benefits

Chris Whitehead, European Technology Co-ordinator, FLINT SCHMIDT GROUP, UK

16.30 **Latest developments in printed RFID tags**

- RFID tag performance considerations (active and passive)
- Antenna alternatives: etching versus printing
- Conductive ink alternatives
- Printing processes / assembly processes
- Commercial lasers
- Performance comparison: printed versus etched RFID labels

Geva Barash, CEO, PARELEC, US

17.00 Closing remarks from the chair

17.10 Drinks reception

Wednesday 9 November 2005

08.30 Registration and refreshments

09.00 **Opening remarks from the chair:**
Prof. Bruce Kahn, Associate Professor,
Printed Electronics Research Group,
ROCHESTER INSTITUTE OF TECHNOLOGY, US

Intelligent inks in security and supply chain applications

09.10 **Latest advances in low cost taggants in inks**

- Advantages and applications for taggants in inks
- Choosing between different types of taggants
- Choosing multiple taggants and the concept of a layered deterrent
- Supply chain advantages and comparisons with rival supply chain technologies
- Using inks to provide overt, covert and forensic / analytical protection
- Measuring the effectiveness of taggants in security applications
- Integration into the manufacturing process
- Future technologies for taggants

Steve Simske, System Programme Manager,
Security Printing, HEWLETT PACKARD, US

09.40 **Micro colour codes in brand protection programmes**

- Market drivers for anti-counterfeiting technologies
- Choosing the right strategy: selection criteria
- Micro colour codes
- Versatility and complexity
- Integration into various printing processes
- Security solutions and supply chain applications
- Current security applications

Nicole Golomb, Head of Marketing and Sales,
Secutag, SIMONS DRUCK, Germany

10.10 **DNA technology: synthetic versus organic DNA**

- Latest advances in DNA taggants in ink applications
- Security performance of DNA technologies
- Choosing between different DNA possibilities
- Advantages of synthetic DNA
- Advantages of organic DNA
- Making the right choice for your application

Dr. Georg Bauer, Managing Director, IDENTIF GMBH, Germany

10.40 **How viable is DNA technology compared with the alternatives?**

- Comparing technology platforms for forensic proof of authenticity
- DNA
- Other additive based approaches
- No additive approach
- DNA: technology push or market pull?
- Brand and tax revenue protection
- Document and currency markets
- DNA and genetic modification: the perceptions
- Requirements for a viable system incorporating DNA (ink delivery, near-real-time detection methodology)
- Candidate DNA based offerings: how do they match up with the present against SunScreen and other commercially proven offerings?

Steve Postle, Director of Technology, SUN CHEMICAL, US

11.10 Morning refreshments

11.30 **Optical taggants in inkjet printers**

- How is simple digital delivery providing covert, machine readable, serialised marks which cannot be counterfeited?
- Field verification and forensic testing in the lab
- Integrating the technology with existing printing systems and into tag and trace systems

Wendell Smith, Business Development Consultant, DNA TECHNOLOGIES, Canada

12.00 **Nano and microdot metal holograms for security printing**

- Markets and applications for holographic inks
- New innovations in micro dot scale holograms in inks
- Implications for security markets

Jiri Perkous, Managing Director, OPTAGLIO, Czech Republic and client (TBC)

12.30 **Secure laser marking using novel colour change ink technology**

- What is laser imaging colour change?
- Current and potential applications
- Employing the latest technological breakthroughs
- Future directions and possibilities to stay one step ahead

Andrew Jackson, Applications Marketing Manager, SHERWOOD, UK

13.00 Lunch will be served for all delegates

Tomorrow's world: future innovations for inks

14.00 **Harnessing the power of intelligent inks through advanced nanomaterials**

- What are quantum dot advanced nanomaterials?
- Unique 'optical fingerprints' of quantum dots
- Creating a spectral barcode
- Overt and covert features of quantum dots
- Processing versatility for multiple ink formulations
- Next generation taggants
- What are the benefits of next generation taggants for the client?
- Other applications

Eva Sbardella, Business Development Manager, EVIDENT TECHNOLOGIES, US and client (TBC)

14.30 **The future of photonic inks**

- Full colour, fully changeable electronic ink
- Technological breakthroughs to enable the technology
- Full colour, constantly updateable images and displays
- Costs and performance
- Suitable applications and future potential

Andre Arsenaault, Department of Chemistry, UNIVERSITY OF TORONTO, Canada

15.00 Afternoon refreshments

15.30 **3D colour printing advances and advantages in packaging**

- Introduction to the technology and advances
- Overview of opportunities for 3D printers in packaging
- Advantages for Constar International

Peter Hansford, European Sales Director, Z CORPORATION, UK and Chris Phelan, Technical Director, European Operations, CONSTAR INTERNATIONAL, UK

16.00 **The future of printed transistors**

- Advancements in materials
- Future applications and remaining challenges
- Trends and developments
- Evolution of printing techniques

Prof. Bruce Kahn, Associate Professor, Printed Electronics Research Group, ROCHESTER INSTITUTE OF TECHNOLOGY, US

16.30 Close of conference

Who should attend?

The conference is a must-see for CTOs and senior scientists, directors of R&D, business development directors, product managers and technical sales directors from the following sectors:

Ink technology and raw materials developers – identify the business opportunities and market potential; benchmark against your competitors; build partnerships and meet potential customers

Packaging manufacturers and converters – discover how intelligent inks can help you meet your customers' demands for increased functionality and added value

Brand owners – get a realistic and practical assessment of the benefits these products and applications can bring in terms of:

- Cost savings through security and supply chain improvements
- New revenue streams through decorative, diagnostics, RFID and conductive ink applications

Exhibition and sponsorship opportunities

If your company supplies services and technology to the intelligent inks community, don't miss this opportunity to reach your audience by taking advantage of the limited number of exhibition and sponsorship opportunities available. Sponsorship of the conference will help you realise your marketing objectives and strengthen your company's position as a leading provider in these industries. For more details on our sponsorship and exhibiting opportunities, please contact Caroline Potapa on +44 (0)1372 802045, carolinep@pira.co.uk

Your event organiser

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Printed & disposable electronics news

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Essential reading for: electronics companies, inks and substrates providers, packaging suppliers, brand, owners and retailers, print equipment manufacturers, tagging and smart card suppliers.

One year subscription, 26 issues: **£800 / €1120 / \$1140**



Industrial Inkjet

The journal of digital printing of electronics and packaging

The only journal dedicated to exploring technologies and applications for inkjet printing of electronics, packaging, displays and labels.

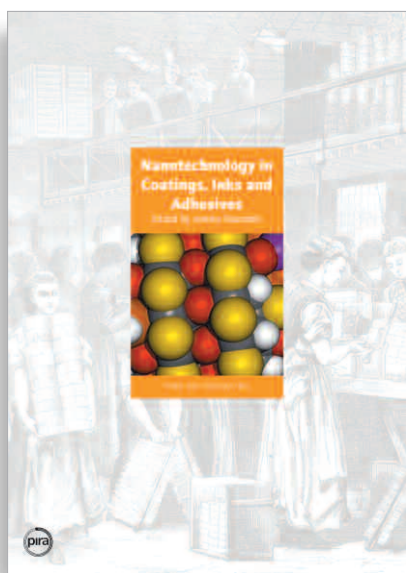
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- **Get ahead** – profiles the hottest topics in inkjet with original market data to help you find new markets and keep you ahead of your competitors.
- **Invest with confidence** – profiles suppliers and manufacturers and demonstrates how inkjet can be integrated into your existing systems, ensuring you make the right investment decisions.

What's covered?

Electronics: OLEDs, flexible displays, RFID, intelligent / smart packaging, sensors, thin film transistors (TFTs)

Packaging: corrugated, cartonboard, flexible, rigid, labels, short run / variable data, brand protection / security, PoP

One year subscription, six issues: **£499 / €749 / \$899**



Nanotechnology in Coatings, Inks and Adhesives

Nano-engineered ultra-thin layers such as inks, adhesives and coatings are big news for packagers. Benefits include better barriers (for both plastics and paper packaging), scratch-resistance, anti-static and anti-microbial capabilities, thermal protection, enhanced visual appeal, printable oxygen indicators, intelligent inks, track-and-trace taggants, and better adhesives for packaging with improved shear strengths, bonding and resistance to heat, chemicals or water. This new study takes you through all the latest developments and their potential benefits.

Other titles in this series include: **Nanotechnology in Plastics Packaging, Nanotechnology in Paper Production** and **Nanotechnology in Paper and Board Packaging**. Visit www.piranet.com for details.

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Conductive Inks in Packaging Applications

Monday 7 November 2005, afternoon

Interactive half day pre-conference workshop

Conductive inks are a key enabler for printed electronics. There are several approaches to achieving conductivity in inks and a wealth of opportunities and applications. This half day pre-conference workshop will give you in depth knowledge on this important topic. You'll hear first hand experiences of the commercial potential, cost-effectiveness, reliability and durability of these solutions, and also the range of applications being realised.

This workshop will be particularly beneficial for printers and ink technology companies evaluating the risk of converting to conductive inks and printed RFID antennae. Packagers and end-users keen to discover the real benefits and remaining challenges of adopting these low-cost solutions should also attend this invaluable session.

13.30 Registration

14.00 **Opening remarks from the chair:**
Geva Barash, CEO, PARELEC, US

14.10 **Solvent free conductive inkjet inks**

- Commercial needs and possible applications
- Environmentally friendly conductive inks
- Comparisons with solvent based conductive inks
- Silver nanoparticles based inks
- Inkjet printing enabled by solvent free ink
- Performance and capabilities
- Self organisation of silver nanoparticles within droplets

Prof. Shlomo Magdassi, HEBREW UNIVERSITY OF JERUSALEM, Israel and Dr. Fernando de la Vega, CEO, CIMA NANOTECH, Israel

14.50 **Printing batteries and power sources with conductive inks**

- Batteries: 'printed power'
- Intelligent conductive inks
- Photovoltaics and printing solar cells
- Intelligent ink and printable electronics
- Markets and applications for printed power sources: panel discussion

Michael Mahan, Executive Vice President, Sales and Marketing, SOLICORE, US

15.30 **Questions and discussion**

15.50 **Recent advances in printed RFID tags**

- Possibilities for printing the chip
- Assessing suitable printing processes
- Costs and performance for a fully printed tag
- Future development work required to achieve a fully printed RFID tag

Dr. Juergen Steiger, Project Manager, Creative, DEGUSSA, Germany

16.30 **Beyond inlays: building RFID transponders on water-based flexo presses**

- High-speed XINK flexographic UHF RFID transponder label manufacturing breakthrough
- Challenges in defining UHF printed antenna performance metrics: optimising production yield through innovative on-press QA tools
- XINK 'seed ink' use in manufacturing HF labels
- Cost, speed and performance advantages of XINK over copper etch / aluminium foil / screenprint
- Environmental benefits of XINK formulations during recycling

Michael Peterson, COO, XINK, US

17.10 **Questions and discussion**

17.30 Close of workshop

