

Commercial Success in Focus at FESPA Digital Textile

Conference Draws Unexpectedly Large Audience

The FESPA Digital Textile conference was a sell-out, with around 130 people crammed into a function room at the Crowne Plaza Hotel, in Geneva, after extra seating had to be installed at the last minute.

Opening on the March 31, the day before the start of the nearby FESPA Digital Printing Europe exhibition, and held in association with *Digital Textile e-Broadcast*, this was the first major European conference on textile inkjet printing for three years and the high level of interest reflected the growth and diversification of the sector in that brief period.

Chairing the event, *Digital Textile* editor **John Scrimshaw** said the conference was intended to be more than simply a ‘parade of engineering’, but a celebration of the many successful commercial applications that had become established as the technology developed and matured. As a mark of this, the programme included as many as eight printers and designers, from widely differing backgrounds, who had agreed to come and described their businesses, markets and printed output.

The keynote speaker was **Gerrit Koele**, program manager for digital finishing at the €800 million-turnover Dutch technical-fabric producer, Royal Ten Cate, who predicted that digital printing would ‘change the world of textiles’ and help bring textile production back to Europe.

Ten Cate is at the heart of the €13 million Digitex research and development project, of which Koele is also co-ordinator. Digitex, which receives half its funding from the European Union, involves a multidisciplinary team of 26 partners from industry and academia, in a programme to develop novel effects on textiles, using inkjet technology to deposit chemicals.

Koele said current areas of interest were: ‘chromic’ materials (which change colour under specific conditions); materials that delivered controlled release of substances such as pharmaceuticals; and antibacterial and anti-static finishes. The research, based on the Xaar 760 and 1001 inkjet heads, was focused on understanding the precise behaviour of drops in a substrate, with the aim of placing drops precisely in a predetermined even pattern, to achieve maximum functionality. Koele also explained the background to Ten Cate’s recent acquisition of inkjet-technology integrator Xennia.

The fundamentals of the current market and technical background were given in two presentations – by **Patti Williams**, of US-based IT Strategies, and **Mike Willis**, of the UK’s Pivotal Resources.

Speaking on a pre-recorded video, Williams stunned many in the audience with breathtaking predictions for future market growth in digital textile printing. Recounting the history of the technology since the early 1990s, she admitted that earlier predictions had overestimated the take-up of dedicated digital printing systems by the textile industry, but said the flexibility of the equipment to print on different substrates had led to major growth in textile printing in the soft-signage sector.

Calculating a total retail value, in 2005, of \$3.3 billion, for all output on digital roll-to-roll and direct-to-garment printers, Williams predicted that this would reach \$18.1 billion by 2010, with by far the greatest growth in the garment sector.

In roll-to-roll, she said textile signage would increase from \$1.7 billion in 2005, to \$3.8 billion in 2010. The non-signage sector, which includes fashion and home textiles, while lagging behind, would nevertheless grow from \$890 million in 2005, to \$1.6 billion in 2010.

Williams said much of the impetus came from the 'green' movement, with fabric seen as greener than vinyl for signage applications. Similar environmental advantages also applied in garment printing, with digital seen as greener than screenprinting, but here there were also other factors such as the relatively low capital investment and small space required for inkjet printing, while direct inkjet gave a softer hand than transfer printing – and did not require skilled labour. On the negative side, digital printing was slower and there was a lack of speciality inks such as metallics, neon and glitter.

For the future, Williams predicted that, in soft signage, more high-speed direct-to-fabric dye-sublimation printers would enter the market, many with finishing capabilities such as cutters. The market would continue to be driven by 'green' strategies as print-for-pay (PFP) shops rebranded themselves as 'green' suppliers.

Mike Willis spoke of the 'phenomenal growth' in industrial graphics printing, using inkjet technology, over the past few years. He said 1.2 million inkjet printers were shipped every week, with HP's revenues from supplies estimated to be \$2 million an hour. Inkjet ink sales worldwide were around \$14 billion - roughly the same as conventional printing inks.

But the relatively low market size for textile applications meant there were few dedicated printheads and custom developments were also rare, due to high costs. The textile industry therefore relied, for now, on printheads developed for the graphics industry.

Willis described the basic principles of the two main types of inkjet printhead – continuous and drop-on-demand – and went on to consider emerging technologies that might impact on the industry. One of these, he said, was a new wave of piezo drop-on-demand printheads based on silicon, which gave higher resolution and higher print speeds. Also significant was the development of fixed printhead arrays, which required considerable improvement in quality and reliability over scanning printheads, but which paid off in higher speeds.

Further down the line, he identified 'potentially disruptive' technologies, including two new printheads, the Silverbrook Memjet and Kodak Stream. He said the Memjet

was silicon MEMS (Micro Electro Mechanical) technology taken to current state of the art. Comparing the suspended-heater thermal bubble system with the latest Epson silicon head, he said the Epson product produced 2 x 360dpi, while the Memjet produces 2 x 800dpi x 5.

He said the Stream, also produced by MEMS technology, was a new continuous inkjet technology, developed by Kodak over the past few years, and scheduled to be demonstrated in a 'concept press' at Drupa 2008, in Germany, in May. The head, using thermal stimulation for ink-drop formation, produced 'offset-class' print quality, at 300 metres a minute, 600dpi.

Several speakers at FESPA Digital Textile explored the realm of digital inks. **Stewart Partridge**, of Nazdar Group, delved into questions facing the flag and banner sector, beginning with the plea: "Don't forget screenprinting!" Elsewhere, he made the point that making a profit is not necessarily environmentally unfriendly: "You can be rich and green."

He questioned the credentials of some ink technologies that claimed to be environmentally friendly, pointing out that 'eco' or 'lo' inks still contained solvents and, although they might smell less than other types of ink, they still polluted the atmosphere. He said 'bio' inks encouraged deforestation and raised grain prices, while many aqueous inks contained some solvent, and all contained humectants.

Partridge went on to describe the main choices for banner printers in terms of materials, which he said were to use vinyl or mesh with solvent inks; polyester banner with aqueous direct disperse inks; or polyester banner with transfer printed aqueous sublimation inks. He analysed the advantages of each substrate, pointing out that vinyl could be very cheap but was not recyclable and could not be incinerated. It was also heavy and offered high wind resistance, although these problems were alleviated where mesh was used instead.

Polyester, by contrast, while it needed a pre-coating, was lighter and could be printed with aqueous inks that produced little or no atmospheric emissions. It could be printed both sides in one pass and could be incinerated for disposal. On the other hand, its outdoor life might not be as long as a solvent banner.

Mickael Mheidle, of Sawgrass Europe, focusing on garment printing, described the company's ChromaBlast range, for transfer printing on cotton, and introduced the Sawgrass Direct Advantage low-cost direct-to-garment printer. He then gave an overview of the SubliM range, for wide-format and industrial applications, before giving details of Sawgrass's latest ink technology, the M range of pigment inks.

For textiles, the range includes two products – M-TT and M-TTS. The former is designed for all textile and leather substrates and requires pretreatment only for the highest-quality applications. Fixation is by heat treatment or steaming for 1-3 minutes at 170-190°C and the system does not require a washing-off process. The special M-TTS inks, for polyester, require no pretreatment at all.

The aqueous inks, available in six colours, rely on two separate reactive groups on the surface of the drops and do not require a binder, thus preserving the natural hand of

the fabric. Mheidle said they offered high physical and chemical stability, as well as excellent runnability and adhesion to all substrates.

Michael Lazzara, of DuPont Artistri, was addressing delegates in the wake of the company's change of course, in which it has ceased to market the Artistri printer in favour of seeking broader distribution channels for its Artistri textile inks. He described the Artistri range of acid, reactive, pigment and disperse inks, together with the Solar Brite range for outdoor banners, and said the main markets it serves were: swimwear, silk accessories, shirts & blouses, sportswear, interior textiles, intimate apparel, flags, soft signage, gaming and industrial. Lazzara showed a matrix, indicating the correct choice of ink and process for the main fibres used in fashion and interiors. He also showed a range of printed textiles, produced by Artistri customers around the world.

Markus Dorer, of **DyStar**, stressed the importance of pretreatment and finishing in achieving final print quality and explained the principles involved. He said effective pretreatment and aftertreatment were important for:

- * Build up/Brilliance/Colour space/Colour constancy
- * Wash-off behaviour
- * Fastness properties (manufacturing and end-use)
- * Fabric handle & drape
- * Controlled shrinkage/dimension stability
- * Black-/White patterns (staining)
- * Finishing effects/Functions/etc

Seventy percent of quality problems in digitally printed fabric had their origins in defective pretreatment. Digital printing inks did not contain the chemicals necessary for fixation, and therefore the fabrics had to be loaded with them during pretreatment.

He said printed fabrics also required a wash-off process to:

- * Remove chemicals
- * Remove unfixed dyes
- * Ensure maximum brilliance
- * Ensure white ground
- * Achieve end-use fastness properties
- * Preserve fabric handle

Only two machinery builders were invited to take part in the conference. **Rob Morskate**, of Osiris Digital Prints, described the development of the super-fast Isis production fabric printer, which has been operating for the past year at the company's factory in the Netherlands. He described the principles of the machine's Imaje continuous printheads and said production parameters were 12-30 metres a minute, at 144dpi, using 8 colours. Efficiency was 70 - 80 %.

Working three shifts on 225 working days a year, and with runs between 500 and 800 metres, the Isis had the capacity to print 3 million metres of fabric a year. In March 2008, the machine had completed a 17,000m print run without interruption. It was due to be installed at a European fashion printer in May.

Nele Dely, of the conference's corporate sponsor, Mutoh Europe, described the history of the company's digital developments and gave an overview of its current Viper textile-printer range, as well as the company's unique Intelligent Interweaving technology, which increases the accuracy and consistency of dot size and dot release during printing.

She listed new market segments that she said had been 'incubated' by digital printing. These included:

- * Personalised gadgets
- * Bags, umbrellas, key hangers, mouse pads, pillows
- * Personalised clothing
- * T-shirts, sportswear, swimwear
- * Personalised special advertising
- * Hot air balloons, spinnakers, large parasols
- * Soft display systems
- * Tensioned fabric structures

Apart from the technology, other factors behind these developments included the opportunities for reduced or no stock holdings, just-in-time production, branding and decentralised production. Dely said the traditional textile-printing business model and company culture needed to change, but this might take a generation.

The most colourful presentations of the two days came from the printers and designers, some of whom were prepared to expose the limitations and well as the advantages of digital textile printing. **Jos Bastiaans**, of Netherlands-based fashion printer Print Unlimited, said the requirements for serving the fashion market were:

- * Speed
- * Offering a variety of fabrics
- * Applying the desired finish
- * Specifying care labels
- * Understanding the customer's style
- * Colour communication
- * Style and size communication
- * Sample and repeat (the same quality)
- * Coping with high and low seasons

Explaining what digital textile printers most needed to help their businesses grow, he said the priorities were professional equipment, scaled down for digital volume, and a lower cost per metre.

Carole Porzycki, of Affaire Personnelle, in France, described an online consumer personalisation business, in which customers' uploaded images were manipulated by designers in order to create a unique design of fabric, which was then cut and made up into T-shirts, bags and other items. Affaire Personnelle worked in conjunction with the sports-clothing specialist Textile Lafitte, based in Troyes.

Porzycki said Affaire Personnelle had deliberately positioned itself at the top of the market, charging from €62-75 for a T-shirt, compared with the competition's €12-25. The website contained a gallery of fabrics, listed by theme. Customers selected a basic design and then supplied a photograph or other image. Affaire Personnelle charged a customisation fee of €20-45 (depending on complexity) to work the customer's image carefully into the basic design.

An average of 100 visitors a day to the website had been achieved without advertising, and the average spend was €10. Seventy percent of customers asked for customised designs.

CAT Digital, as described by **Vicky Begg**, was a bureau service that specialised in customised design, from fashion, to fine art, and beyond. Part of the Glasgow School of Art, it was a self-funded operation with big-name clients from the UK and overseas.

Begg showed examples of work produced for haute-couture designers such as Giles and Mulberry, as well as fabrics for corporate interiors. CAT Digital also took on private commissions – one of the most unusual of which was for a digitally printed coffin shroud. Another niche business was the sale of digitally printed reproductions of classic fabric designs by Lucienne Day and Robert Stewart, which could be ordered online.

From a completely different part of the textile-printing world, **Peter Stehr**, of Kleen-Tex Industries, Austria, was enthusiastic about the opportunities in pile-fabric printing. He described the company's global business, producing items such as bar towels, and corporately customised entrance mats for shops and hotels.

Martin Thurmer, of Shipmate Flags, in the Netherlands, was more equivocal, admitting that there had been times when he wondered whether his Reggiani DReAM machine was not more of a 'nightmare'. He also considered that there was not yet a digital machine on the market that was ideally suited to the flag business.

However, on balance the machine was 'fast, flexible and fabulous', although the printer had to 'furiously' balance parameters such as the number of passes, ink volume, speed, RIP software, file building, humidity and pretreatment.

He said digital flag printing, as part of a total service concept, was now mature – although strong digital process management was a 'must', and big improvements were needed in colours and pretreatment. However, new printhead technologies would arise and wider and faster machines would compete with traditional screenprinters. Screenprinting was 'finally losing momentum'.

Ron Smart, of the UK's biggest digital textile printer, R.A. Smart, said the business combined digital with traditional screenprinting and even weaving – the company had installed Jacquard machinery to weave silk-tie fabrics in 2003 and had increased production every year since. The company operated two Monna Lisa digital fabric printers, as well as several Mimaki machines, which were used for production only – never for sampling.

Operating screen alongside digital, he said one of the advantages of the later was that it eliminated the need for 'fenting', in which initial samples were produced by mini-screen or digital, but designs must then be re-sampled on the production machine. In this way, a million-pound machine could be tied up for two to three days while the range was re-sampled.

But he said there were also disadvantages. For example, in the UK vat dyes were normally used for furnishing fabrics. The obvious digital alternative was reactivities but, although these had equivalent wash and rub fastness, they had lower light fastness. Digital pigment inks had good light fastness but poor rub values and, although the less demanding process could mean lower prices, digital pigment inks had a poor reputation because of the need to use a binder for fixation. Binders in digital dyes gave runnability problems and had the effect of diluting colour.

For the future, he said the industry must 'break the mould' of closed systems. "We would not contemplate running our screenprinting and dyeing business with only one supplier of dyes, and digital cannot consider going forward any other way," he said. R.A. Smart is also a distributor of digital textile equipment and suppliers, and Ron Smart said: "We use and sell dyes from different suppliers and will continue to do so. Open systems will create pressure on dyestuff prices. Dyestuff prices currently are too large a proportion of total printing costs."

Also from the UK, **Ian Ingle**, whose small business Eyes Wide Digital, produces a range of digital print that extends from fine-art giclée reproductions to giant beanbags, showed pictures of brightly coloured deckchairs, which produced for London's Royal Parks and can be ordered online from the parks' website.

And finally, **Simon Beales**, business partner of top fashion designer Sarah Arnett, described the central role played by digital fabric printing in her creative output. Arnett's fashions, many featuring bold, colourful prints, are stocked by more than 70 of the world's leading stores, including the UK's Harvey Nichols, Bugatti in Dubai and Therese in Frankfurt. Celebrity customers include Kylie Minogue and Christina Aguilera, and the designer's bespoke wedding dresses sell for £5,000.

All delegates and speakers at the conference were invited to an informal dinner, which was sponsored by the digital ink supplier J-Teck3.

For more information on the conference please contact:

Karen Pooley
Group Marketing Manager, FESPA Ltd
Karen.pooley@fespa.com