ISSUE 3
2010

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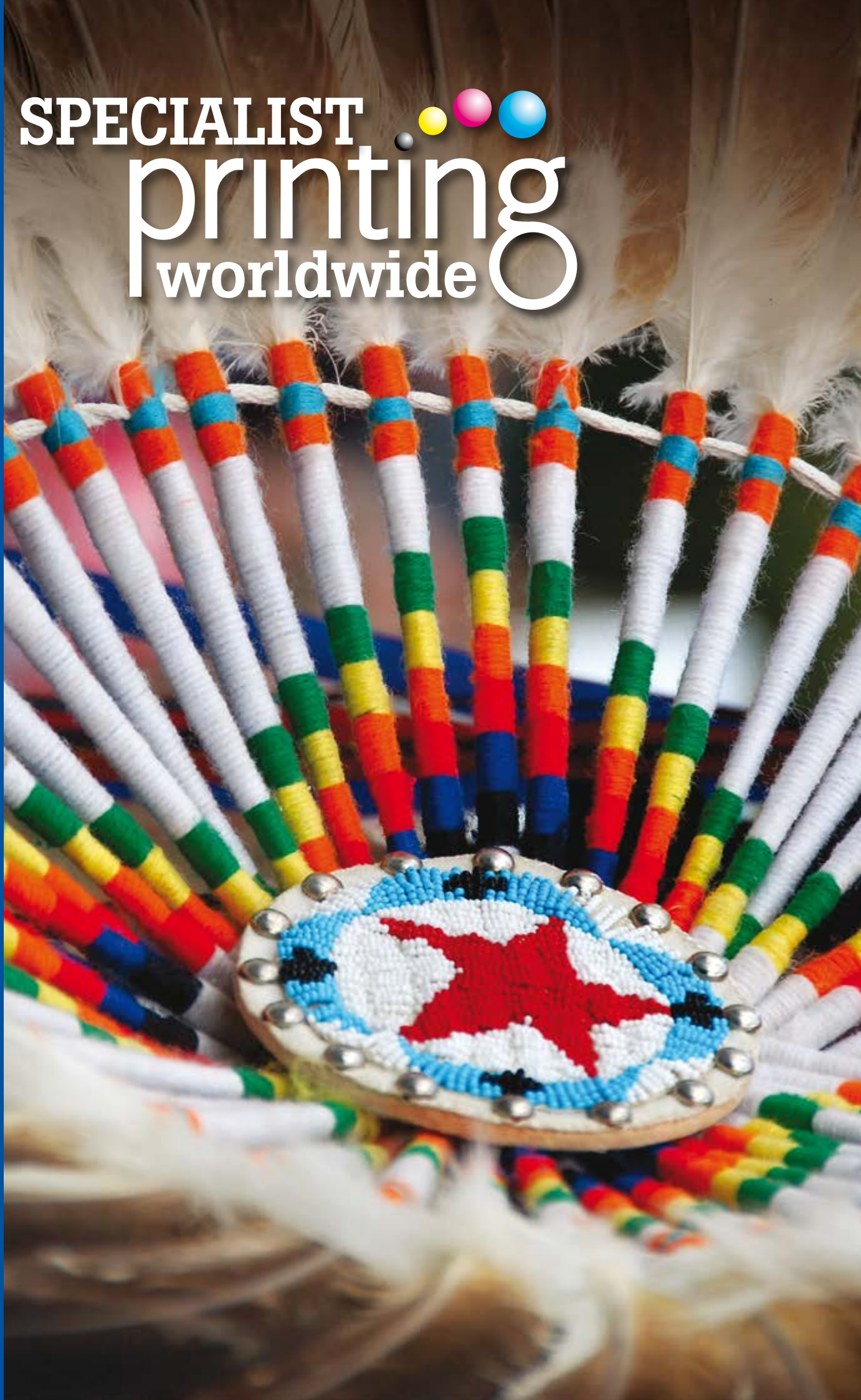

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## MESSAGE FROM BRYAN COLLINGS


**Summer in the northern hemisphere is now behind us. It started with an excellent FESPA show in Munich, and we are now look forwarding to major Viscom shows in Milan and Frankfurt. The Specialist Printing Worldwide team is also looking forward to seeing many of our readers and advertisers at the forthcoming glasstec show in Düsseldorf where we will be showcasing Glass Worldwide, our sister magazine for the international glass industry.**

October will then see us visiting Las Vegas for SGIA '10. This is always a high point of the year for us, giving us an opportunity to see all that is new in North America and giving us quality time with our colleagues from the SGIA team led by Michael Robertson. From all that I've heard, this year will be most interesting with new developments on show that our extensive American readership should not risk missing.

Another of our sponsors, ESMA, is working hard to ensure it offers a top class series of presentations at the technical seminars being staged on 10 and 11 March next year in Düsseldorf. See page 62 for more details.

With European and American markets slowly pulling themselves out of recession, Specialist Printing Worldwide remains committed to bringing highly valuable technical information to an ever widening international audience. If you have not yet subscribed, this is your free promotional copy; to receive future issues for only €55/$80/£45 per annum, please visit http://www.specialistprinting.com/sub_form.htm

Wishing you a great season,

Bryan Collings, Publishing Director,
*Specialist Printing Worldwide*

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## Spartanics adds Finecut-Plus-Rotary combination system

*The Spartanics Finecut-Plus-Rotary combination laser die cutting and rotary die cutting system*

Printers seeking the speed and capabilities of rotary die cutters without the bottomless lifetime costs for dies and make the transition to short run jobs with limitless cut configurations, can now use the Spartanics Finecut-Plus-Rotary combination laser die cutting and rotary die cutting system.

Expected to be valuable for companies that are increasingly combining short-run and long-run work, therefore needing different cutting tools for optimum efficiency, the Spartanics Finecut-Plus-Rotary is a versatile cutting technology that the company says can serve as the optimal cutting solution for diverse job requirements. Capabilities include rotary die cutting at speeds as fast as 121 meters /minute, tool-free laser die cutting with super-accurate single source lasers at speeds at 100m/minute) and rotary sheeting – cutting variable lengths as much as two times faster than traditional guillotine sheeters.

Also included is semi-rotary die cutting, with X Y registration, add-on modules for UV coatings, lamination and slitting, and laser die cutting features only found in the Finecut technology line with automated optimisation of cutting paths for fastest web speeds without need for operator intervention or set-up. ■

## Cham teams up with the coffee experts

An Illy logo was prominently displayed on the Cham Paper Group stand at FESPA. It transpires that the company teamed up with Illy, the coffee experts, for this year's show. This might not seem a particularly obvious alliance but it was explained that the core business propositions of CPG were actually closely aligned to those of Illy. Both companies strive to supply a top quality product in a field where many cheaper inferior alternatives are available; both companies focus on customer support to ensure that they always use the best products to meet their needs.

Thinking outside the box is another strength of Cham Paper Group – and the coffee was good. ■

## Ten year anniversary for Bordeaux

Bordeaux Digital PrintInk celebrated ten years of innovation, experience and market know-how at FESPA in June. Since it was founded, the company says it has been successful in understanding the market in which it operates and has continued to launch products synergetic with the market needs.

"Bordeaux's R&D and marketing advantage have enabled us to foresee the industry requirements and to respond effectively to the market needs," says Moshe Zach, Bordeaux co-founder and CEO.

Bordeaux has expanded its sales channels rapidly all over the world via regionally appointed distributors. During the exhibition, Bordeaux granted an "authorised dealer" certification for customers who engage with Bordeaux business activities. ■

## World firsts from Lüscher

The latest arrival from Lüscher is its Multi DX which unites the worlds of CtP and CtS, occupying a product category of its own. Called Swiss CTX, or Computer-to-Xposure, the X stands for any type of plate or substrate and is claimed to be the only direct exposure system in the world which makes it possible to process printing plates used in all standard procedures.

The Multi DX can be used for the production of standard offset plates, waterless offset plates (Toray), letterpress plates (LAMS layer) and flexo plates (LAMS layer), in addition to tampon printing plates and flexible screen-printing systems, such as Screeny by Gallus.

The combination of these characteristics is coupled with the ability to expose rigid flat screens. The flat-bed design of the machine enables users to image anything from a postage stamp size to a maximum size of 800 x 600mm. In particular, the Multi DX can also image plates based on rigid materials (steel or aluminium) up to 50mm thick.

There are three types of devices within the Multi DX product line, the first being the Multi DXUV with blue UV laser diodes (405 nm), the Multi DXIR with infrared thermal laser diodes (940 nm) and, thirdly, the Multi DXHybird with a combination of blue UV diodes and IR thermal diodes.

The Lüscher Multi DXUV is equally suitable for label printers and users who print objects such as tubes, bottles, and CDs, as it is for technical screen-printing. ■

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## Ruco's focus on safety and environmental friendliness

Ruco latest focus on inks is formulated to meet the highest demands in terms of safety and environmental friendliness. Its T30 and T40 pad printing inks are free from aromatic compounds and cyclo-hexanones, and it also featured its low-migration 945UV/MA screen-printing inks and the 940UV/G series for graphics. The company has also announced a newly developed T120 pad printing ink.


*Specialist inks from Ruco*

Ruco's T30 responds to the demand for halogen-free pad printing inks with its one-component T30 inks which are free from phthalates (plasticisers) and critical solvents such as aromatic compounds and cyclohexanones as well as health-related chlorine compounds. T30 pad printing inks boast good mechanical and chemical resistance and a high degree of elasticity.

The series T40 also offers good mechanical and chemical resistance and high elasticity, again being free from cyclohexanones and aromatic compounds. Due to their fast curing properties, they can be used both on standard pad printing machines and on high-speed machines. Also available are new one- and two-component T120 inks for the rotary pad printing of bottle caps, plus Ruco's 940UV/G low migration and barium-free screen-printing inks developed especially for highly delicate applications in the field for baby bottles and food packaging. ■

## New Fasson label specification programme saves converters time and costs

Avery Dennison has made the specification of its Fasson Durables labelstocks easier and more cost-effective for label converters. With the new Fasson Specification Programme, converters outsource to Avery Dennison the complex and often expensive compliance and performance testing process. This is of particular relevance in the challenging and labour-intensive electronics and automotive label markets.

Specifying new label materials for the durable goods market entails multi-level compliance process steps and converters can now fully outsource this specification procedure. Avery Dennison technical consultants, and the company's state-of-the-art testing facilities will define the most appropriate labelstocks for end users' specific technical requirements – at the right price. Converters also benefit by saving the substantial time and costs involved in managing the specification process in-house, or via commercial testing facilities. Avery Dennison offers in-depth support within the context of a defined project plan and a joint confidentiality agreement if appropriate. ■

## Sihl Paper launches new 'eco-friendlier' media

Sihl has developed a new media which is says is suitable for use with HP's latex printing technologies. The Germany-based company has developed new wet-strength poster papers that it claims can be used with the eco-friendly latex inks used in the Designjet models L65500 and L25500 and the HP Scitex LX600 and LX800.

The multi-purpose Post-2-Cure Papers (125, 180 and blueback 125) linked to HP's new latex inks and print technology enable digital service providers to produce weather and water resistant prints compatible with results from real solvent inks.

Sihl says its Post-2-Cure papers are optimally suited for both indoor and general outdoor advertising. ■

## Early reminder for Drupa 2012 registration

Although Drupa 2012, which runs from 3 to 16 May 2012, is still some way off, International Trade Shows Link Ltd (ITSL), the UK representative for Messe Düsseldorf, is reminding readers about the cut-off date for companies wishing to exhibit at the giant global print media trade fair.

All space application forms must be returned to ITSL at its Hemel Hempstead offices by the end of October 2010. Previous exhibitors will have been automatically sent the necessary documentation, but anyone with any queries or questions is urged to contact the organisers now on +44 1442 230033, email info@itsluk.com. ■

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## New pad printing platform

Product decorating systems' specialist ITW Trans Tech has released its Syncro pad printing platform. This electro-mechanical servo driven platform was conceived over several years of intense design studies and is claimed to be one of the most advanced pad printers on the market. Syncro features a large set of advanced features allowing it to be used as a stand-alone as well as fully integrated automation printer. Incorporated is the ExpressPad pad system, which the company says offers a big advancement in operator convenience along with shorter set up times. ActiveDoctoring allows for increased doctoring performance as well as decreased wear on the cliché plate, whilst servo technology allows for many machine adjustments not normally found on pad printers. A key benefit of this technology is the capability for variable adjustment of the stroke of the pad. Syncro incorporates a feature with 'Teach and Save' job storage for fast make-ready and convenient job repeats. Print parameters can easily be recalled for repeat jobs for decreased setup times. The ITW Trans Tech Syncro will replace the company's outgoing Sealcup line of pad printers. ■

## Mirror effect ink launched

Hong Kong based speciality inks manufacturer JM Coatings + Inks has recently launched its series IS-1800 Mirror Effect Ink, which can be used to screen-print or spray onto opaque substrates like Treated PET, PC, PMMA , ABS, PS, PVC, and glossy cardboard products. The company says this series is the stepping stone to printing mirror effects on every glossy and rigid surface including UV coated surfaces, to suit custom requirements. ■

## New moves for Kammann

Kammann has brought its entire team into one modern factory, housing all its resources under one roof instead of the three factory suites from which it formerly operated. The company says it will enable it to become more efficient and will help to provide customers with better service on sales, technical advice and spares.

This move is designed to ensure that Kammann continues to develop new and interesting technologies for today's and tomorrow's requirements in bottle printing, containers, special articles, DVD/Blue Ray disk or web printing. It is increasing the size of its R & D departments to make sure it is always at the forefront of new technologies.

Kammann has also launched the K15 CNC bottle printing machine. This uses CNC control to ensure ultra-fast make-ready times with little difference in time when changing between round and oval bottles for example.

Kammann's K61 web printing system is continually being developed to keep in front of the latest technical developments in the electronic printing industry, for medical applications or for new display technologies. This highly versatile machine can be configured with a range of technologies from screen to flexo. For the new label markets the K61 Offset has been specially developed for those products that require extra print quality. A range of extras can be fitted as options. ■

*Kammann brings its resources under one roof*

## Coldenhove Papier fights Korean patent infringement

Coldenhove Papier has taken legal action against several Korean producers of dye sublimation transfer papers and their European and American distributors. Ongoing infringement of the company's global patents on these products forced the Dutch based paper mill to take this step.

"It is not our intention to exclude anyone from the market," claims Kees Herder, CEO of Coldenhove Papier. "But we do have the right and obligation to defend out patent; we have a firm belief in fair play and tried to settle matters in a more friendly manner – but failed. We had no choice but to go to court.

"We feel that some of the Korean producers are willing to work towards an alternative solution, like joining our other licensees and, of course, we'd prefer that," Herder concludes.

Coldenhove Papier was founded in Eerbeek, the Netherlands, in 1661. From a traditional paper mill it has developed progressively into a solutions' provider for a number of diverse industries which includes the digital dye sublimation industry. ■


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## More new arrivals for Durst include a textile option

Durst has introduced two new additions to its portfolio of wide-format printers with the arrival of the Rhotex and the Rho 750. The first of these systems is the company's first industrial textile printer whilst the second represents a series of modular UV-curable solutions.

The 3.2m wide Rhotex uses water-based dispersed dye inks which Durst says are entirely environmentally friendly, recyclable and disposable. Harmless to the skin, these inks are completely odour-free and produce no VOCs. They are also flame-retardant and provide bright, vibrant and impactful images and which comply with the Blue Wool scale 7 for outdoor applications with up to two years' durability.

Capable of printing on an exceptional range of different media, the Durst Rho 750 outputs up to 2m wide by any length of material and will handle roll media, including a heavy roll option, without any speed loss. Special features allow for printing heavy (up to 70kg on the belt) and/or thick boards (up to 7cm). There is also a corrugated print option which includes fully automated loading and unloading of media. Both machines feature six colours and a maximum resolution of 600dpi. ■

*The Rhotex 320 is Durst's first entrant into the industrial textile market*

*Durst's new Rho 750 comes in Basic, Presto and HS versions*

## Ikonics clarification

In Ikonics Corporation's 'Performance Solutions' article on page 14 of Issue 2/2010 of Specialist Printing Worldwide, the author was incorrectly titled as Tony Bergstedt instead of Troy Bergstedt. Troy is Director of Chemical Research at Ikonics and we offer our sincere apologies for this error.

For more details on this article which covered the complex interplay of a successful printer-ink-substrate suite, please contact Troy at tbergstedt@ikonics.com or telephone +1 218 628 2217. ■

*G-Bond UltraCure offers a complete solution for stretching, adhering and hardening*

## New products from Kiwo

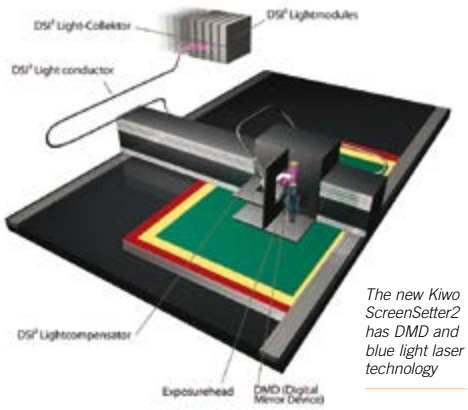
Introduced so far this year is a range of new products from Kissel + Wolf including Kiwobond 1105 FC and hardener Kiwodur 1105 Green which combine to offer a new possibility to adhere fully coated Sefar mesh with only two components. Estelan Aqua Guard Blue is a newly developed two-component water-based lacquer which increases the chemical and mechanical resistance of emulsions for increased print runs.

G-Bond UltraCure offers a complete solution for stretching, adhering and hardening. It integrates with Kiwo UV-curable UltraCure technology. Also new is the Kiwo I-Jet 2, an economic CtS solution for graphic and technical screen printing which, in its XL format, handles stencils of up to 122 x 152cm (XL) outer frame size.

The new Kiwo ScreenSetter2 has DMD and blue light laser technology, and is based on the successful exposure technology of Kiwo's ScreenSetter with UV light sources. This revised machine concept has 20 laser diodes so that light is bundled and directed on the DMD via a light compensator.

New emulsions include Kiwo's Gold series for pure, high tech applications and special requirements in the field of electronics, solar techniques and medical applications. Azocol Z 133, Z 155 and Z 160 are all solvent and water resistant diazo dual cure emulsions which offer different properties for a variety of applications. Azocol Z 180 NanoCoat is extremely resistant to abrasion on the longest print runs, whilst Azocol S 309 is ideal where fine lines and half-tones are required. Azocol S 385 and KiwoFiller 409 conductive diazo dual cure emulsion reduces problems of static charge, and Polycol S 210 Eco is a solvent resistant one-component SBQ emulsion which is more than 90 pecent based on renewable raw materials.

Screen-printing films include new products in the Kiwofilm S series of solvent resistant, diazo sensitised stencil making films which can be transferred by water, whilst adhesives in the Kiwo family have been augmented with Aqua Tec NF 2, a water-based spray. Finally, a new MecoFlock D series is available with options for flocking of textiles, paper, plus glass and ceramics. ■




*The new Kiwo ScreenSetter2 has DMD and blue light laser technology*

*Agfa's Dotrix modular UV-curable system*

## Unit Safety Signs in Japan gains speed and flexibility with Agfa :Dotrix Modular

Unit Safety Signs (USS), a large Japanese company specialising in the design and manufacture of safety signs and products for the safety industry, is able to handle shorter run lengths and expand its media assortment thanks to its Agfa Graphics Dotrix digital UV ink-jet printer. The company, which has been operating since 1968, has seen the market for safety signs growing in recent years, and the competition getting tougher and tougher.

One challenge for USS has been dealing with the trend for shorter run lengths and quicker turnaround times requested by their clients. USS has also seen reductions in demand for signs printed on rigid media and board, with the growth seen for signs printed on roll or flexible sheet material leading it to invest in the Dotrix.

"We also need the ability of the Dotrix to print on demand and reduce inventory of finished products by turning work around quicker than was possible before," says Keijiro Kuroda, Production Manager of USS. "We can complete work very quickly compared to traditional print methods. Unlike the screen-printing method the Dotrix doesn't need a drying oven – this is another cash/energy saving and one that is good for the environment". The Dotrix digital UV-curable ink-jet machine has a print width of 63cm, and is able to print with high production capacity on a wide variety of substrates ranging from flexible foils, to folding cartons up to 600 micron. Its modular construction allows UV flexo printing stations for coating and varnishing to be added to the roll-to-roll basic configuration. Slitting and die-cutting as well as sheeter installations can also be integrated to complete the system. ■

## Grapo unveils its Gemini

The Gemini flat-bed UV-curable printer has been introduced by Grapo Technologies and boasts speeds of up to 90 square m/hour, along with double the speed capabilities of the previous generation Manta printers when printing with white ink at 15 to 30 square m/hour. This new printer features CMYK plus white and is intended for screen-printers seeking to move to more efficient digital technologies as well as display and sign producers wishing to migrate their operations away from less environmentally friendly solvent printing solutions.

Offset and flexo printers can also use Gemini for more cost-effective production of short-run samples and/or to diversify their product offerings. This machine features ten Xaar 1001 greyscale print-heads with variable drop sizes from 6 to 42 picolitres and has single-pass capabilities for the four colours and white ink. As well as being suitable for printing onto transparent substrates, Grapo says that it produces high quality output of skin tones and flat colours. The Gemini is designed to print on a wide range of substrates, from irregularly shaped items, wood and glass to all types of plastic, vinyl and paper materials. It is supplied with a two year warranty. ■

*The Grapo Gemini features Xaar 1001 greyscale print-heads*

## Printer specific inks from Bordeaux

Recognising the increasing demand in the high-productive, solvent-based inks market for a wide colour gamut, fast drying and vivid colours, Bordeaux has developed a new product line to replace some of its current hard-solvent inks. Designated Prime, this new ink family is said to offer high quality at a low cost with good durability on both coated and uncoated materials.

This is an attempt to create a solvent based ink which is printer specific and corresponds to the newest technology. The company's new Prime inks generation are stated to be compatible with print-heads including Xaar 128/80, 128/40, 126, 382 (Proton), Fujifilm Dimatix Spectra SPT510 and Konica Minolta 512. ■

## Protecting graphics on brick walls

Graffiti can be regularly found on building fronts and brick walls, a problem which can now be countered with the help of MACtac. On top of digitally printable self-adhesive films for direct application on brickwork and concrete, the company's researchers have now developed flexible films to protect these graphics against graffiti.

Graffiti left on the new IMAGin LAG 100 protective films is easily removed with organic cleaning products. This, in turn, results in savings on cleaning or refurbishing costs, contributing towards cities looking more aesthetically pleasing and, at the same time, protecting the environment. These self-adhesive solutions have been designed specifically to combat vandalism at an acceptable cost. ■


*MACtac's IMAGin LAG 100 can help combat graffiti*

# SMOOTH AND SEAMLESS ...

## PDF Workflow is becoming accepted by the wide-format digital printing sector. Ruben Cagnie explains how companies can streamline throughput, save time and costs and reduce waste

*Ruben Cagnie*

**The growing, and inevitable, complexities of arranging an effective workflow for wide-format digital print has necessitated a cohesive suite of options for simplifying all parts of a job. No two print companies are the same and nor do manufacturers follow a standard configuration for the way in which a business operates. The addition of EskoArtwork's *i*-cut Suite is the simplest method of refining and standardising all the elements involved from start to completion. This software is very modular with incredible depth. It addresses the entire work flow but starts with the primary needs of the digital printer. *i*-cut Suite handles all the functionality that's required to optimise efficient throughput and eliminates any problems or deficiencies which might be detected en route.**

The components in the *i*-cut Suite are sophisticated in their performance yet simple to incorporate into a user's workflow. EskoArtwork has done something very different here by addressing software UV printer manufacturers needs where volumes and accuracy are driving the requirement for greater accuracy and speed of throughput. Yet display producers and print service providers demand a short learning curve and foolproof operation.

EskoArtwork's strengths in the prepress sector have now brought true PDF functionality to the wide-format ink-jet sector. Companies can now dispel the myths that moving to a true PDF workflow removes file control from the operator. However, in practical terms, it is this format which has transformed the myriad file types in use today into a single standard which contains all required elements, including colour information, text and images, plus cutting paths. With efficient preflighting and fixing of files there is the additional comfort zone that errors cannot be forwarded to the RIP and printer, and that all output can be standardised for consistency across all print devices and materials.

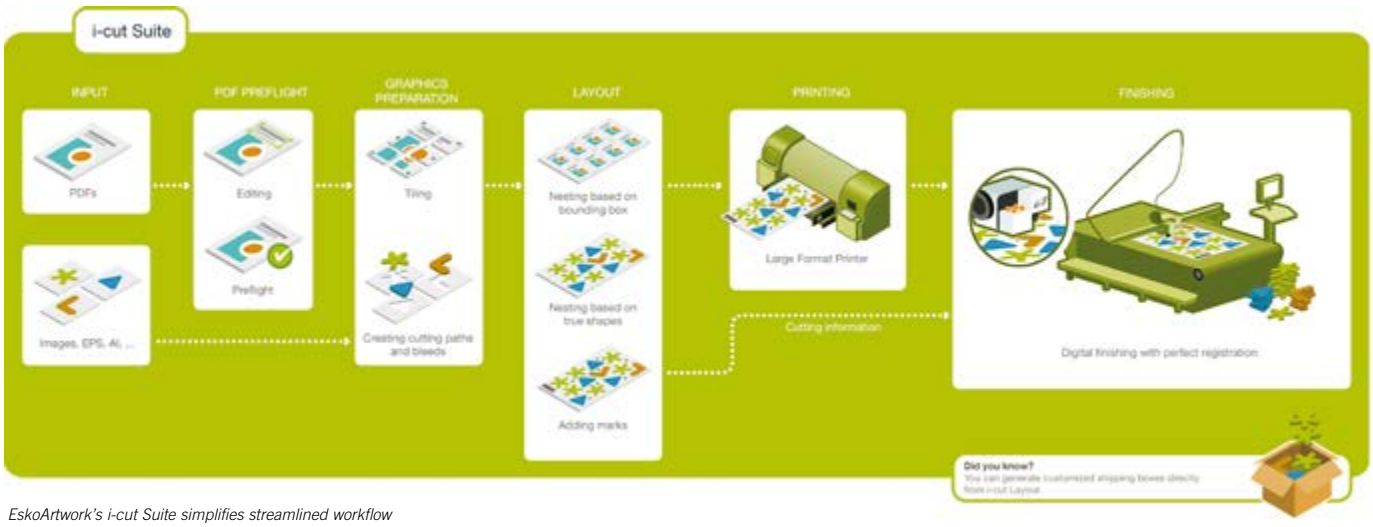
The method of operation is logical in its functionality. The workflow for a small user is as simple as preflight/fix, optimum sheet layout and other tools and submit to print. If digital finishing is involved, the preparation for cut paths is handled before submitting to the cutter. Once a user understands these steps, many of which are optional, EskoArtwork can automate all these functions in a true workflow. It sounds almost too good to be true and simple, but it's important to remember EskoArtwork's background and new approach towards pre-press for sign and display.

The benefits gained from establishing an *i*-cut Suite workflow include the elimination of errors and time savings engendered during the prepress operation. Because of the ability to produce the right results, first time and every time, there is minimal waste and this is particularly crucial where material space needs to be optimised with the most effective use of nesting or step-and-repeat.

EskoArtwork's *i*-cut Suite is based on logical and effective simplicity brought into play at the point where, traditionally, most errors manifest themselves. The software is based on the main strengths of the company, these being its expertise in PDF preflighting and editing, and its knowledge of computerised cutting and routing which are both important aspects within the packaging, sign and display and, increasingly, the point-of-sale markets.

Although EskoArtwork's Kongsberg cutting tables are well-known throughout the wide-format digital printing industry, the company's main emphasis has always been as a software company. It is this expertise in layout for packaging and printing applications which

*Continued over*




*EskoArtwork's i-cut Suite simplifies streamlined workflow*

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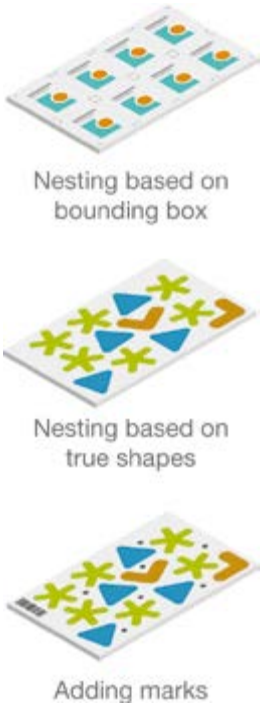


*Interactive building and editing of layouts on the material*

has led it to success in design-to-print-to-cut workflows with products based on Enfocus PDF preflight and checking technology (and also an EskoArtwork company).

EskoArtwork's *i*-cut Suite finally removes the complexities around using a properly integrated PDF workflow, a step which many display producers have not yet taken because they are not fully conversant with the capabilities offered within this single, logical format. Instead, many still work with a plethora of different file formats and rely on their RIP to provide basic options relating to profiling, queuing and batching.

However, the RIP is not designed to be a checking or error-detecting device and it isn't until the job is printed that mistakes are noticed. Thus, as a part of EskoArtwork Suite 10, the modular elements within *i*-cut Suite give users the proper workflow tools and the ability to check that all files have been prepared properly. By catching errors and other issues early in the process, the result is a cost-effective, foolproof and streamlined production system.

## THE IMPORTANCE OF PREFLIGHTING AND FIXING

The first element is *i*-cut Preflight which holds the key to ensuring incoming PDF data is preflighted correctly by detecting automatically any possible issues and reporting them in detail back to the operator. The effectiveness of this module is augmented by the fact that the user can work with interactive tools and apply any corrections or amendments which are needed without needing to gain access to the native application used to generate or create the original design. It is this ability to 'fix' problems, either manually or automatically within the solution, that makes this unique.

Based on EskoArtwork's established Enfocus technology which is renowned for PDF preflight and checking, this offers compliance with CertifiedPDF.net which utilises criteria that allows for reliable file exchange. This adheres to PDF quality specifications and provides absolute consistency with regard to settings and criteria essential for error-free production. Thus, standardised specifications and print queues can be generated between different companies and departments, even remotely, to maintain precision integration, regardless of RIP or print device.

Preflighting is established and totally accepted in commercial print and many other print industries but new to the sign and display sectors. Thus, *i*-cut PDF Preflight is not a new product to EskoArtwork but very new to digital print service providers.

## LAYOUT INTERACTIVITY

The next element within the *i*-cut Suite is the Layout function, that can be used by printers or by those with printers and digital cutters. Most file formats such as EPS, AI, PDF etc. can be imported. The module is used for the interactive building and editing of layouts on the material. This feature incorporates several options for variation on how the graphics are placed, with grouping for "minimum waste" optimising the nesting of individual images to gain the most effective coverage on the sheet. "Maximum productivity" is designed to cater for high quantities by creating the greatest number of identical sheets as possible so that set-up times for printing and finishing are reduced. For rectangular or square designs, "minimum cuts" configures the finishing process by arranging the nested graphics in such a way that straight cuts, or slices, can be achieved. This option is also suited to applications being cut by a standard guillotine.

Both these *i*-cut Suite modules are integral elements within *i*-cut Vision Pro, the control system which generates the data for precision die-less cutting. It is this function that incorporates essential information, such as registration marks and barcodes, and is vital for accurate results with minimal operator intervention.

## MODULAR ADDITIONS

Although the key elements in EskoArtwork's *i*-cut Suite are all that's necessary for a user to implement a streamlined workflow operation, the modular format means that more advanced options can be incorporated when production requirements decree specific functionality. For example, where direct integration with common CAD formats is needed, such as with ArtiosCAD, DXF and CFF2, "Structural Design" provides three-dimensional viewing and editing for PDF output. This feature's sophistication allows


*i-cut Preflight ensures incoming PDF data is preflighted correctly*

boxes to be created simply by entering the dimensions which result in a product ready for assembly and use, straight from the cutting table.

Problems with designs submitted without cutting paths can be either generated or rectified using the "Graphics Preparation" module which is able to carry out this task on both vector and bitmap image files, with automatic bleed generation and the ability to add specific finishing marks to the job. This bleed generation is interesting because it allows image errors to be easily covered when straightening or making a contour path smoother. Similarly, where users are working with complex and irregular shapes, "True Shape Nesting" increases the flexibility of the sheet area, allowing for a tighter fit of images within the area without the limits imposed by bounding boxes.

EskoArtwork's philosophy is straightforward. The company realises that many elements required for wide-format production are established and reliable so its intention is to link existing functions and add true workflow capability which is seamless in operation. Features, such as colour management and RIPping, are not touched and will already be in use by print companies; by removing the perception that PDF files are complicated, end users of all sizes can now benefit from the versatility of adding *i*-cut Suite to their existing Macintosh or Windows set-up. ■

***Ruben Cagnie is Product Manager Sign & Display at EskoArtwork***

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# I-SCREENPRINT

## Advances in mesh and stencil technology are explained by Ross Balfour and Paolo Canonico

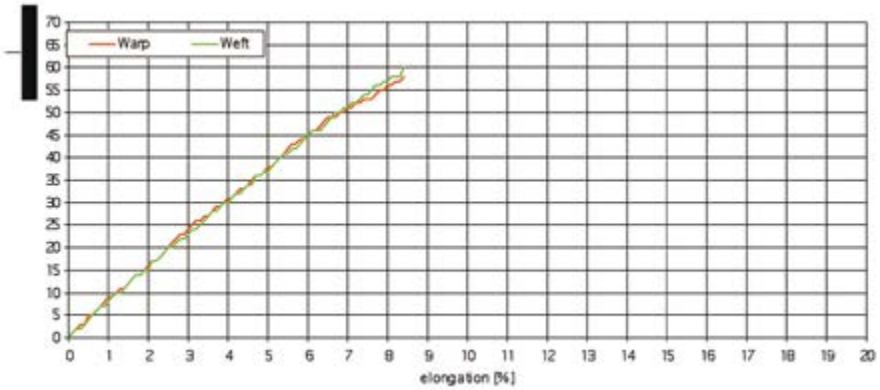


*Figure 1: tension vs elongation, made by biaxial test, for a state-of-the-art fabric, 120/cm with 34 micron threads (305/in).*

**Fespa 2010 in Munich was a showcase for recent developments in technology for speciality printing. Screen-printing was well represented, with major new developments on display that highlighted advances that have taken place with key materials used to fabricate screens. This process continues to adapt and evolve in the face of challenges presented by the rapid evolution of digital direct printing technologies.**

For many applications screen-printing is still by far the preferred and superior method of depositing inks, or coatings, for both decorative or functional applications. This is especially true in the dynamic and rapidly growing industrial printing segment, where "inks" are actively functioning components integrated into working devices such as biomedical sensors, capacitive touch screens and photovoltaic cells.

The versatility of the screen-printing process to handle flexible, rigid and bulky substrates and its ability to accurately deposit almost any flow-able material means that it is only limited by the imagination of product designers and manufacturing engineers.

### ADVANCES

The screen, attached to a rigid frame, that is active during the printing process is composed of two major components, the mesh and the stencil.

Major advances in materials science and process technologies have occurred that advance the capabilities of both these components. The end result is more precise and accurate control over placement and deposit of inks and functional fluids than ever before. This expands the capability of screen-printing to play a key role in high tolerance manufacturing and the production of micro-engineered products, such as those already mentioned above, but also including ceramic capacitors, fuel-cells, thin film batteries, OLEDs and TFT displays.

These improvements and advances fall into three main categories.

- Mechanical stability of screen mesh – new generation fabrics with new high modulus yarn and process improvements
- Photomechanical integrity of stencil – enhanced adhesion from new plasma based fabric surface treatments
- Image acutance and chemical resistance – resulting from improved photochemistry employed in manufacture of stencil materials.

These three advances when combined are capable of changing the rules and enable fabrication of screens with previously unmatched capabilities.

We take a deeper look at these new technologies and the benefits they offer screen-printers.

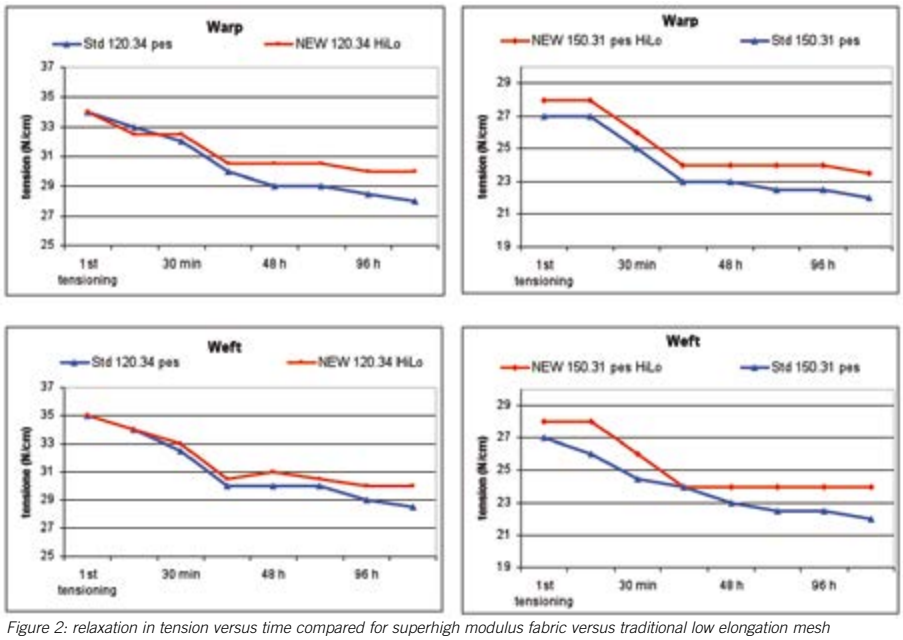


*Figure 2: relaxation in tension versus time compared for superhigh modulus fabric versus traditional low elongation mesh*

### MECHANICS OF SCREEN MESH

Most screen-printing is carried out using mesh woven with synthetic monofilament polyester yarn. Polyester is a broad term, describing a family of polymers with widely differing properties. Polymers can be soft and elastic like those used in stretchable garments, or as hard as a bowling ball. Mesh for screen-printing requires yarn with high modulus, or high tensile strength, but also with the ability to resist non-elastic deformation.

The combination of these two properties results in a fabric with the ability to reach high tension levels, and with the stability to hold them there during the stresses of printing and screen recycling.

The chemical nature of the polyester used as a base for yarn extrusion is a critical factor, as are the processing steps used to align the polymer chains inside the yarn. Alignment increases the crystalline structure of the polymer and multiplies its strength and resilience.

Process changes during weaving and the various finishing steps in the manufacture of the fabric have an additional influence on the internal structure of the yarn. This provides

an additional opportunity to fine-tune the alignment of the polymers and to further improve the modulus and stability of the finished fabric.

Weaving techniques and finishing processes are fundamental steps in achieving very high consistency of the mesh open areas, especially when the fabric is under high level of mechanical stress and deformation.

During the warping and weaving processes, the stress applied to warp and weft yarns are very different. As a consequence, intermediate or loom state fabric, exhibits quite different amorphous and crystalline structures of the yarns in the two directions.

The finishing process, properly optimised, is able to balance the fabric in warp and weft directions and achieve a uniform product with tightly restricted tolerances.

This optimisation of the stress-strain behaviour of the fabric in warp and weft also enables precise and consistent geometry to be maintained under dynamic conditions and at any level of tension required for the specific application.

A well balanced fabric in warp and weft combined with the high modulus of the latest yarns are responsible for a very limited and uniform relaxation of the tension level with time. This is a basic requirement to get high precision and consistency in the printing process.

Figure 1 illustrates tension vs elongation, made by biaxial test, for a state-of-the-art fabric, 120/cm with 34 micron threads (305/in).

Figure 2 shows relaxation in tension versus time compared for superhigh modulus fabric versus traditional low elongation mesh.

Mechanical properties combined with optimised surface properties represent basic features of any fabric designed to create a high-end screen.

## SURFACE TREATMENTS FOR IMPROVED DURABILITY AND SCREEN-LIFE

Monofilament yarns at their origin possess quite poor surface properties with respect to wettability and adhesion. This is due to the very smooth surface and also inert nature of the polyester itself.

Stencil adhesion is affected by both the physical and chemical properties of the fabric surface. For many years chemical suppliers have offered degreasers and mesh preparations to clean and also treat the fabric surface, in order to maximise stencil adhesion and durability of the screen during use. There have also been attempts over the years to improve the surface adhesion characteristics of the mesh by applying special coatings or other types of treatments. While some of these attempts were moderately successful, they never guaranteed a high enough level of performance where tangible and measurable benefits could be realised by all end users under real world conditions.

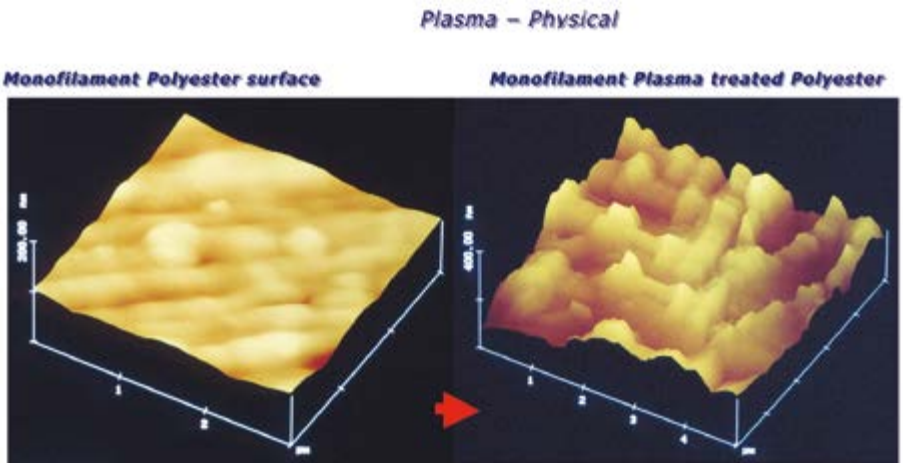


*Figure 3: typical degree of surface modification that occurs with controlled plasma treatment*

Plasma treatment of screen mesh is the breakthrough that provides just such a benefit.

Plasma is the fourth state of matter alongside solids, liquids and gases. It's a high energy soup of ions and electrons that reacts onto and permanently alters any surface it contacts.

Plasma treatments, more than chemical coatings, are able to modify the surface and dramatically improve the roughness at nano-molecular scales. This improves the compatibility and therefore increases the adhesion between fabric and photosensitive emulsions or films.

Figure 3 illustrates typical degree of surface modification that occurs with controlled plasma treatment.

Newly developed plasma treatments, Hibondplus, based on optimised gases, are even able to create unique bonding with very highly reactive emulsions requiring exposure times of only a few milliseconds, as in the case of DLE computer-to-screen engraving systems.

This ability enables high productivity manufacturing of long lasting screens designed for printing on almost any type of substrate.

The process used to surface treat screen mesh must be carefully controlled in order to maximise benefits and the mixture of gases used to form the plasma can also be varied to achieve maximum effect.

The resulting fabric, in addition to a nano-textured surface, also undergoes changes that alter the surface energy, or dyne level. Both of these changes are beneficial and enable major improvements in adhesion level and mechanical integrity of both photo-emulsion and stencil films.

Figure 4 illustrates the dramatic improvement in wettability as evidenced by contact angle and spreading of water on the fabric surface.

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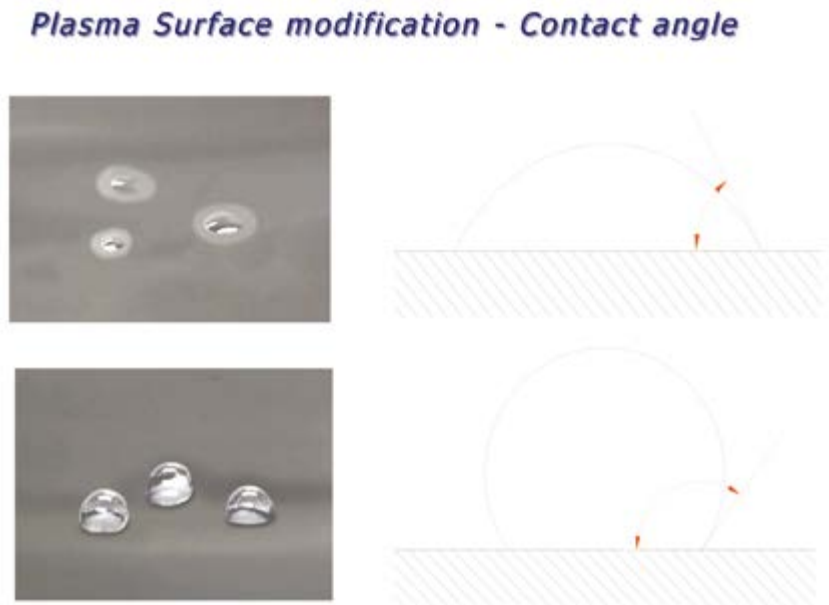


*Figure 4: the dramatic improvement in wettability as evidenced by contact angle and spreading of water on the fabric surface*

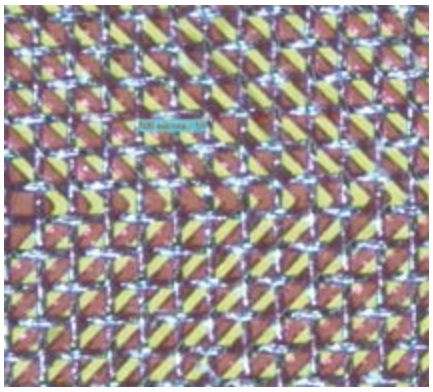

Figure 5: stencil reproducing 20 micron lines and spaces on 400.0007 wire mesh at 10 micron EOM, or stencil thickness, total screen thickness 43 microns.

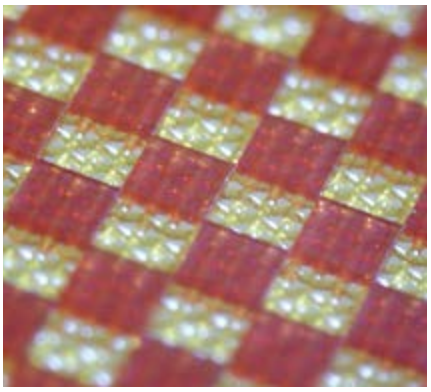

Figure 6: the precise imaging quality of a stencil designed to print a demanding image with good reproducibility and excellent ink release.

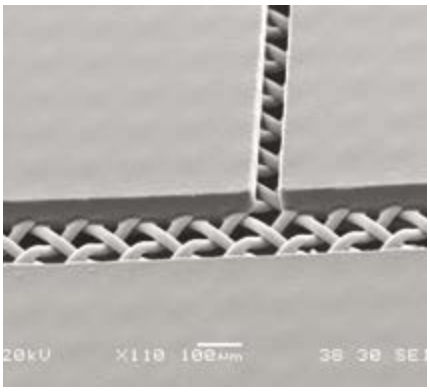

Figure 7: stencil with reproduction of 60 micron wide finger electrode on 230.0012 wiremesh. Stencil thickness 50 microns and total thickness 105 microns.

## IMPROVED STENCIL MATERIALS

A screen has the attributes of a photo-imageable composite material. Since the scaffolding (mesh) has been improved, a new emphasis has been placed on improving the quality of the stencil that it built on top. In addition, new demands are being placed on photo-stencils, based on micro-imaging requirements, or the ability to withstand exposure to extreme environments.

Nowhere is this more true than in the industrial printing segment and particularly in the emerging field of electronics printing.

Fluids used to manufacture functional coatings, layers and patterns can be based on highly aggressive solvents, such as NMP or DMAc. Such is the case with polyimide dielectric coatings used as insulators in printable electronics, or electroluminescent inks used for backlights, or display and signage applications. These materials typically destroy traditional stencil materials in just a few minutes.

Recently, specially developed photo-emulsions have been introduced that produce stencils able to withstand prolonged exposure to these highly aggressive materials without swelling and loss of abrasion resistance or image quality. Screen-printing thus enables high volume, low cost, production of innovative devices based on the functional attributes of these components.

Similarly, highly abrasive particulate inks, some containing glass frit or metal flakes and particles, require a stencil that is resilient and can withstand high levels of abrasion without suffering premature wear and breakdown. These types of inks have traditionally been used for glass and ceramic printing applications, but are now expanding into other areas where image accuracy and integrity are critical parameters that affect device efficiency or functionality, and there is no tolerance for compromise due to premature wear.

The challenge to polymer chemists and emulsion companies has been to upgrade the chemical and mechanical resistance of their products without compromising other essential features, such as easy coatability and drying, short exposure and processing times and, lastly reclaimability, for easy screen recycling.

Fortunately, advances in raw materials and formulation technologies have kept pace with these increasing demands. Products are readily available today that are capable of producing stencils with durability that far exceeds that available just a few years ago.

The ability to resolve finer and finer details, and the image acutance to print them faithfully is another area where advances have been made. Fine line printing of electronic components such as ceramic capacitors and photo-voltaic cells requires stencils able to resolve sub 100 micron details and with exquisite edge definition. Such is the quality required, that film positives or photo-tools used to expose these screens are plotted at resolutions up to 25,000dpi, versus the typical resolutions traditionally used by screen-printers of 1,270 or, sometimes, 2,540dpi.

In order to meet these requirements, new chemistry has been developed with a sub-micron resolution capability that is able to cleanly resolve well defined image elements smaller than 20 microns. See figure 5 that shows chevron pattern of 20 micron lines and spaces.

In order to precisely control ink deposit at this level of image detail, the 3D structure of the stencil is important. Sidewall geometry, smoothness and surface release properties are critical factors that control fluid transfer and enable clean and faithful micro reproduction of highly detailed images, including halftone dots, fine lines and letters and other design elements. Figure 6 shows the precise imaging quality of a stencil designed to print a demanding image with good reproducibility and excellent ink release.

Very demanding applications, such as the printing of 'fingers', or front electrode, onto crystalline silicon wafers to produce solar cells, demand thick films of ink, in this case silver paste, to be consistently deposited as very thin lines, often less than 100 microns wide. The ultimate efficiency of the cell, and its 20 year guarantee of field service performance, depends to a large extent on the quality and consistency of the print. Screens designed for this application require thick stencils with very fine resolution and edge definition, and also the ability to cleanly release a high volume of paste onto the wafer surface. Figure 7 shows an extreme example of this.

## CONCLUSION

Screen-printing in the second decade of the 21st century is alive and well and enjoying a renaissance of sorts as it evolves into a micro-engineering process used in the manufacturing of everyday devices, from mobile phones to automobiles. It continues to thrive in more traditional applications, ranging widely from garment decoration to the printing of large-format architectural glass. The technological advances that have occurred in both screen mesh and stencil materials have benefits that are being realised across all these diverse segments of our industry and are testimony to the commitment being displayed by leading manufacturers to support and enlarge the opportunities available to their customers. ■

***Ross Balfour is Global Business Unit Manager at Saati Chemicals Division and Paolo Canonico is Technical Director at Saati***

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# The SAATI Team


thanks all visitors who came on the Saati stand at Fespa,
it was a pleasure to meet you there

and special thanks to André Peyske

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# CLEAR-COATS AND ADHESIVES

## Joe Clarke asks if there is any room left for screen-printing

**Historically screen-printing has been relegated to: "when there isn't any other conceivable way to print it … then use a screen". If what's needed is impeccable resolution – print it sheet-fed offset, for archival permanence then it's best to laminate and, if it's simply a flood-coat – roller-coat 'em. Then again if it's only one-sheet that's wanted, use digital for the best economic run length (ERL).**

Given this cornucopia of coating options it would seem to leave precious few press-sheets for screen-printing. But screen-printing is arguably the best way to transfer a thick-film spot or a controlled film coating onto a press-sheet. When it comes to clear-coats and adhesives it might seem to the casual observer: "the resolution is not too high, they're neither archival nor flooded and there's a lot more than a few press sheets so perhaps we should screen print it?". A moment later our observer discovers the casual speed of traditional screen-printing, he cringes, rethinks the alternatives and begins to pray for more capacity. Fortunately this era of screen press-atrophy has come to an end due to a new upgrade for virtually all cylinders, automatic and semi-automatic screen-printing presses. Clarke Product Renovation has conquered the historic snail's-paced speed by dividing the problem of fluid and compound transfer into two parts – ejection and extrusion. But, first, here's a word about the status quo:

### OLD-FASHIONED "SQUEEGEES"

The 'speed-limit' with single-hinge squeegees is the fact that they buckle; worse yet they buckle only in one direction. They have unidirectional response on a screen which has bi-directional, variable resistance – and the two will never, ever fit together! This disparity causes buckling, worst near the edges of the image, so the buckled blade-ends transfer the clear far too early in the stroke.

Long before the edge of the blade arrives to make a tight seal between stencil and stock, the ink is injected prematurely resulting in mottling and blurring. In the centre of the screen, where the footprint is the same oversize as at the edge, there is no mesh resistance; here we find ink and glue waste, poor clearing and poor wetting, peppered with orange-peel and pinholes. Speed without adequate pressure worsens mottling – blurring and wetting so the orange-peel and pinholes proliferate, directly proportional to the increase in speed.

The buckling problem gets even worse with adhesives; there is no way to control the buckling on the mesh and, inevitably, the volume of adhesive is constricted so the operator slows the press in hopes to squeeze enough glue through the mesh before the customer comes to pick up the job. The press operator labours to find a window of opportunity between poor mesh clearing, an orange-peel surface with pinholes in the image and blurring at the ends of the stroke. To solve the problems of quality and speed, CPR has divided fluid transfer into ejection for clear-coats and extrusion for adhesives.

*This Sakurai Maestro cylinder press has a feed-speed for most press sheets of more than 4,000 sheets per hour.*

### EJECTION AND EXTRUSION TRANSFER

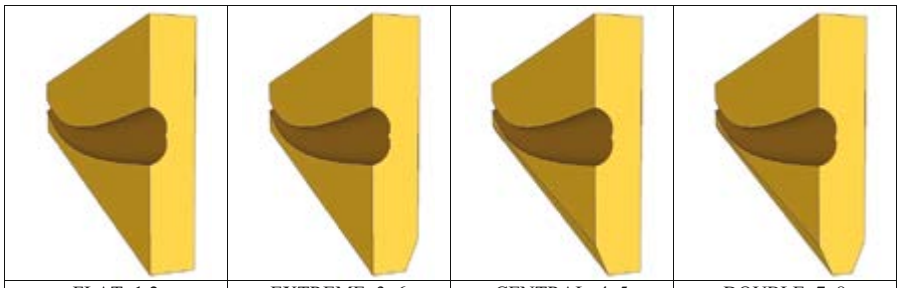
Ejection is the preferred method for transferring clear-coats onto press-sheets via sufficient fluid velocity. The applicable screen mesh is relatively fine for a nominal 7 to 25 micron coating film thickness. The 'juice' is a low viscosity, thixotropic fluid with pretty good surface tension which responds positively to an increase in shear-rate. As a result, CPR metering blades can be run at 'press-feed-speed' which, for top-end cylinder presses is more than 4,000 sheets per hour and, if the stock will feed at this speed, the clear can be precisely metered at that rate.

There is an added bonus with high-speed coating via screen; the juice has a rheological "sweet-spot" and, when this point is reached, fluid momentum takes over and the surface appearance of the clear-coat improves significantly. Any appearance of streaks, fish-eyes, mottling, orange-peel or mesh marks is eliminated and the clear looks more like a smooth sheet of laminate. In addition, this method of transfer allows a bare minimum of pressure on the screen and cylinder. As a result, screen-stretch is virtually eliminated so registration accuracy and repeatability are facilitated.

Extrusion is the preferred method for transferring adhesives without excess pressure or blade buckling. Adhesives are very high tack, relatively high viscosity, marginally shear-thinning, pseudoplastic with generally poor surface tension. Unlike the speed-responsive clears above, these compounds require sustained fluid volume in order to transfer. It would be foolish to believe the same 'squeegee' profile which can properly eject a clear-coat would be used to extrude adequate adhesive onto a press sheet. Although the required film thickness may vary, based on the specs of the adhesive, the screen meshes are relatively coarser so the footprint (the area of contact between the blade and the mesh during the print stroke) must be adequate to cover one mesh period in order to efficiently transfer the adhesive. The funnel (the size and shape of the cross-sectional area between blade and mesh) must never constrict the flow of adhesive – for example, to deposit 75 micron of a water-based, pressure-sensitive adhesive. If at any point, prior to fluid transfer, the distance between the blade and the mesh is less than 75 micron, the fluid pressure will increase, the fluid volume will decrease proportionally and once this occurs, there is no way to recover that volume. By regulating the footprint and the funnel virtually all adhesives can be printed at top feed-speeds as well.

### VARIABLE-HINGE TECHNOLOGY

Speed (and quality) occurs when the blade adapts to the resistance differential of the trampoline-like screen mesh – more elastic in the centre, less at the perimeter. CPR



| FLAT: 1.2 | EXTREME: 3, 6 | CENTRAL: 4, 5 | DOUBLE: 7. 8 |
|---|---|---|---|

*The standard selection of ejection and extrusion blades suitable for clear-coating and adhesive applications at top press speed. The name is listed below each blade and the relative deposits per screen mesh are listed to the right of the name.*

metering blades use variable-hinge technology (patent pending) to apply minimum, consistent pressure on the mesh for film-consistent clears and adhesives at any and all points, irrespective of the image size or its position on the sheet. The variable-hinge allows printing near the ideal 'zero-angle', literally vertical because CPR blades do not need to buckle in order to transfer either low-viscosity fluids or high-viscosity compounds. Each metering blade has an imprinted serial number for complete product traceability of flexural and compressive moduli, cast gauge, durometer and all hinge metrics, plus pitch gradient and height. They are made of a special NdI co-polymer for stay-flat performance and resistance to abrasion and chemical swelling. There are four standard profiles – flat, central, extreme and double. Each is deposit-rated and listed on an accompanying navigational table. The table directs while on-press for ideal deposition via proper blade selection each of which runs at the upper limit of press feed-speed… buckle-up to be safe! ■

***Joe Clarke is President of Clarke Product Renovation***

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# DIMENSIONAL RELIABILITY

## John Gaudiuso explains a recent study that was conducted to see the effects of dimensional reliability and printing conditions as well as mesh material

**Dimensional reliability is becoming more of an issue in printing electronics. Typical screens start to lose their dimensional reliability after the first few thousand prints. There are many factors that attribute to this. Squeegee pressures, snap-off distance, and mesh material are some of these factors and, while they are by no means are all of the factors, they will be the focus of this article. Many of these factors are related to each other in order to achieve a good printed pattern. A recent study was conducted at NBC Meshtec Inc to see the effects of dimensional reliability and printing conditions as well as mesh material. The following screen parameters were used for the tests:**

- **Frame Size:** 320mm x 320mm
- **Frame Type:** Aluminium Cast Frame
- **Mesh Type:** V330-23 (VScreen)
- **Tension:** 32N
- **Bias Angle:** 30°
- **Emulsion Thickness:** 0.015mm

- **Frame Size:** 320mm x 320mm
- **Frame Type:** Aluminum Cast Frame
- **Mesh Type:** SUS325-23 (VScreen)
- **Tension:** 26N
- **Bias Angle:** 30°
- **Emulsion Thickness:** 0.015mm

- **Paste:** UV Ink (US200)
- **Substrate:** Glass Plate

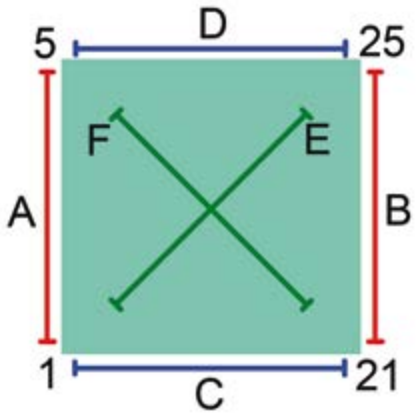
Squeegee pressure can have both a negative and a positive effect on printed dimensions. In a short test run, different squeegee pressures were used in combination with different snap-off distances. The following printing conditions were used for the short test run:

- **Printer:** LS-15GX
- **Snap-Off and Squeegee Pressure:**
  0.8mm – 8, 19 and 30N
  1.4mm – 12, 21 and 30N
  2.0mm – 16, 23 and 30N
- **Type of Squeegee:** Micro-Squeegee
- **Squeegee Durometer:** 70 Shores
- **Squeegee Angle:** 70°
- **Squeegee Length:** 170mm
- **Squeegee Speed:** 200mm/sec

When comparing the squeegee pressure to any particular snap-off distance there was no noticeable difference in dimensional reliability from screen to print. This could be due to a high printing speed. Further testing is needed to see how squeegee speed affects the printed dimensions.

Looking at the effect of snap-off distance versus the printed dimensional lengths at 30N of pressure had shown that having a lower snap-off distance dramatically increases the accuracy of screen to print. At a 2mm snap-off distance, a cross measurement from corner to corner showed to have a distance of 0.055mm distance off from the nominal screen measurement. At 0.8mm, the same cross measurement showed to be 0.015mm off from the nominal screen measurement. This is a 0.040mm improvement. This difference can be attributed to the screen not expanding as much when the squeegee makes contact with the screen. The largest measurement difference on a 0.8mm snap-off distance was 0.020mm, which is still 0.035mm better than the largest difference on the 2mm snap-off. In short, reducing snap-off distance can effectively improve dimensional accuracy from screen to print.

The previous section discussed printed distortion compared to screen. The following will discuss printed sample compared from print 100 to print 30,000. It will also discuss screen dimensional change after 30,000 prints using VScreen versus Stainless Steel mesh (SUS mesh). Both VScreen and SUS mesh screens

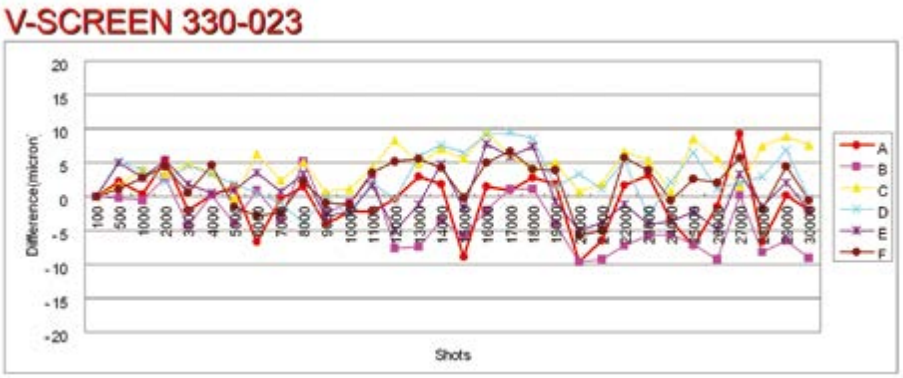



*Locations of dimensional measurements.*

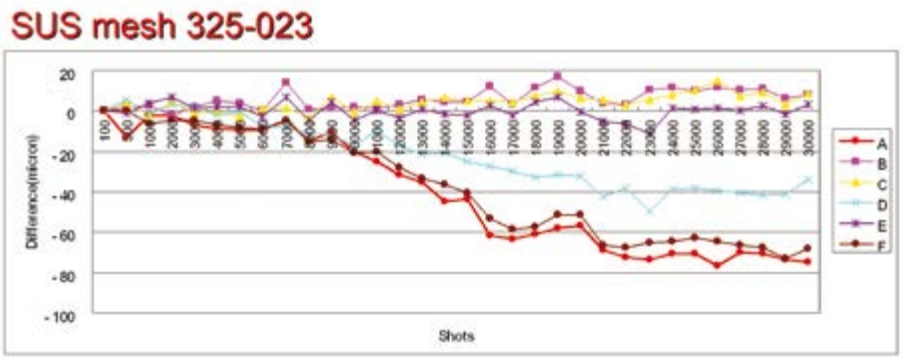
were printed 30,000 times and were measured every 1,000th print. The following printing parameters were used for both screens:

- **Printer:** LS-15GX
- **Snap-Off:** 2.0mm
- **Squeegee Pressure:** 30N
- **Type of Squeegee:** Micro-Squeegee
- **Squeegee Durometer:** 70 Shores
- **Squeegee Angle:** 70°
- **Squeegee Length:** 170mm
- **Squeegee Speed:** 200mm/sec

*Continued over*




*Printed comparison results from print 100 to print 30,000 using VScreen.*




*Printed comparison results from print 100 to print 30,000 using SUS mesh.*

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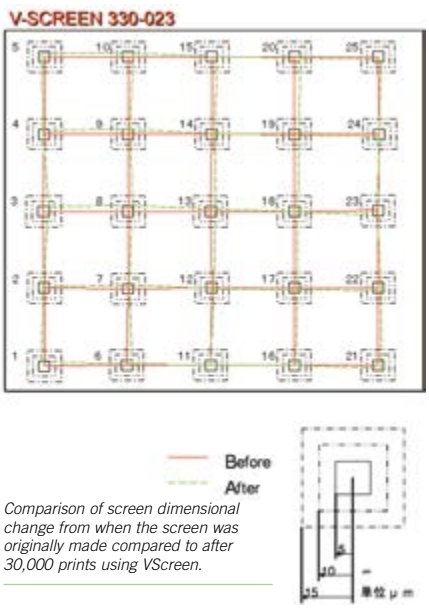
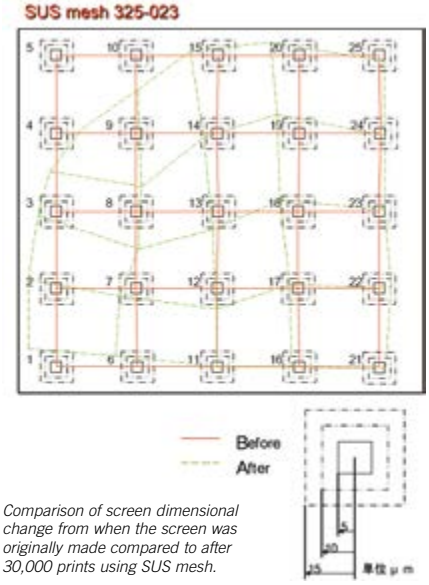
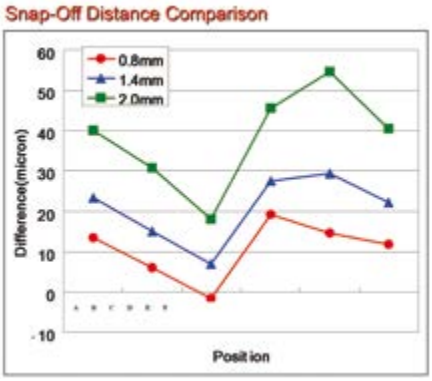



*Comparison of screen dimensional change from when the screen was originally made compared to after 30,000 prints using VScreen.*




*Comparison of screen dimensional change from when the screen was originally made compared to after 30,000 prints using SUS mesh.*




*Comparison chart of different snap-off distances and printed distortion from screen.*

Comparing the print from print 100 to print 30,000, a dimensional change of +/- 0.01mm was shown on the VScreen. The dimensional change was even shorter up to 11,000 prints where the change was only +/- 0.006mm. After that is where it ranged between +/- 0.01mm. By being able to register tight dimensional tolerances, it is theoretically possible to screen print accurately one print on top of another in order to achieve a narrow line width and high print deposit. Another use for this is to print multiple layers of a part on top of each other with a higher degree of accuracy.

The results of the SUS mesh screen were drastically different from VScreen. The results are decent at the start of the print but then get progressively worse as the print continues. Below the 10,000th prints, the range is between +/- 0.020mm. At 30,000 prints the range is between 0.020 and -0.080mm. These results show that SUS mesh has difficulties retaining its dimensional reliability and performing multiple prints on each other could prove to be difficult over many prints.

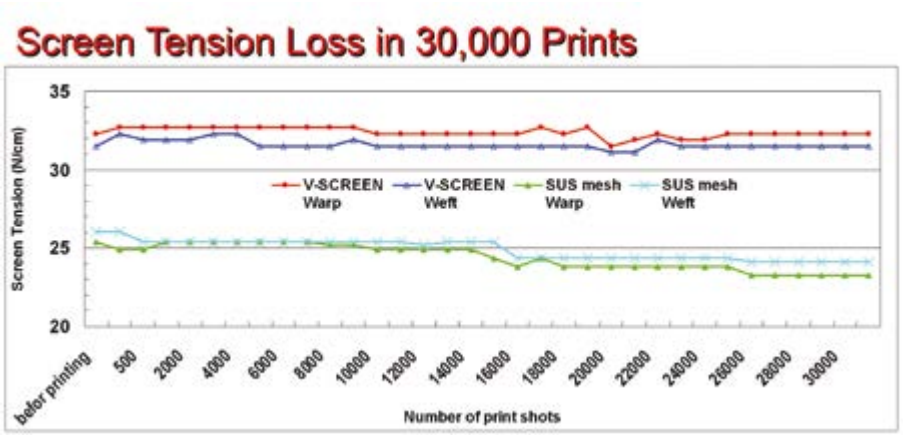
Another comparison was done looking at the dimensional change of the screen over the 30,000 prints. There was little change in the VScreen screen dimensions over this print run. The largest difference was 0.007mm in a cross measurement and as little as 0.001mm difference on the left side of the screen. The SUS mesh screen on the other hand had a much larger change. At the top of the screen the change was 49.667mm. The smallest change was in the cross measurement at 0.003mm. Here is the corresponding data:

**VScreen Results:**

| | Before | After | Difference |
|---|---|---|---|
| A | 120.000 | 119.999 | -0.001 |
| B | 119.998 | 119.997 | -0.001 |
| C | 119.995 | 120.000 | 0.005 |
| D | 119.991 | 119.995 | 0.004 |
| E | 169.706 | 169.704 | -0.002 |
| F | 169.693 | 169.700 | 0.007 |

**SUS Mesh Results:**

| | Before | After | Difference |
|---|---|---|---|
| A | 119.999 | 119.901 | -0.098 |
| B | 120.000 | 119.992 | -0.008 |
| C | 119.995 | 120.025 | 0.030 |
| D | 119.996 | 169.663 | 49.667 |
| E | 169.702 | 169.705 | 0.003 |
| F | 169.705 | 169.638 | -0.067 |




*Comparison of the screen tension loss between VScreen and SUS mesh over 30,000 prints.*

## MEASUREMENT LOCATIONS

Little change to the dimensions on the VScreen screen is due to the VScreen's material properties. The material doesn't elongate during print runs providing for a major advantage when print registration is important. SUS mesh and polyester meshes tend to elongate during printing which will change your print result over time. The SUS mesh is made of a hard metal that does not have much in terms of elastic properties. Once the SUS mesh extends, it will elongate and never return fully to the original point it started at. With the VScreen material, however, there is little change in the threads once the screen is expanded and the screen goes back to the original starting point, making it more reliable. Another key element in this is that the VScreen material lost 1N of tension during the entire print run while SUS mesh lost 2N of tension. Tension loss can have a great impact on screen dimensions.

In conclusion, dimensional reliability is becoming more of a concern as precise printing becomes more critical. There are ways to help with reducing dimensional change to print. One way is to reduce the snap-off distance as much as possible. Squeegee pressure may be another possibility but needs to be further investigated at slower squeegee speeds. Another key factor is the material being used. SUS mesh loses its dimensional reliability too quickly to print accurately over long print runs. The VScreen material, however, has many valuable properties that help keep dimensional reliability over long print runs. ■

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# THE DEVELOPMENT OF ALTERNATIVE INKS FOR WIDE-FORMAT PRINTERS

## Dr Oleg Dardik of Bordeaux Digital PrintInk outlines the principles behind the company's manufacturing philosophy

**When wide-format ink-jet printers were first introduced in early 1990s the inks used were 'hard solvent' products. The printing speed was slow and, although color gamut was limited, the quality was relatively good; but the inks had a significant disadvantage in the form of high VOC (volatile organic compounds) and HAP (hazardous airborne pollutants) levels and harsh odour stemming from solvents, which are harmful to printer operators and to the environment. As digital wide-format printing progressed, printers advanced as well as the inks they used.**

The introduction of lower solvent-level inks (also known as mild, low, light or eco) was the second phase in digital ink-jet evolution. These were introduced initially for Mimaki (mild solvent) printers and later for the Seiko ColorPainter series and the HP Designjet 9000 series (low solvent).

These inks were still solvent based, but were free of cyclohexanone solvent, had a milder odour and were less harmful for humans and the environment. The emergence of eco-solvent ink by Mutoh and later by Roland for their new printers was a real breakthrough. These inks had a very low odour and consequently possessed a positive effect on the working environment, which was less harmful than that of the low solvent inks.

More recently some companies have released 'bio' inks. The main difference between low solvent-level inks and bio is that the latter is based on solvents that are made from renewable resources such as corn or soy beans and are biodegradable. However, it should be noted that solvents which are not synthesised from vegetables might be biodegradable as well as not releasing HAPs. These bio inks are new in the industry and it is still early to assess their compatibility with printers set on high-speed modes.

Nevertheless, all inks, except for water-based inks but including eco or bio, might be manufactured using solvents that emanate vapour which may be harmful to humans and have a characteristic odour. The vapour typical to these solvents requires some degree of ventilation which entails investment in infrastructure that may be costly to print shops. However, the ventilation requirements of eco solvent and bio ink is significantly lower than traditional hard solvent inks. The debate around the ecological benefits of bio inks involves many environmental factors which are beyond the scope of this article.

Another fundamental development in the graphic arts industry was the introduction of printers using UV-curable inks. UV technology has a list of advantages when compared to solvent based inks. First, the ink is cured (polymerised) simultaneously during printing; there is no emitting of VOCs. Second, UV-curable inks don't dry in the nozzles which prolong the life of the print-heads. Third, the range of substrates that may be used with UV-curable inks is wider.

The latest trend in UV printers is LED curing technology, which replaces UV lamps. The LED UV printers consume less energy in the curing stage and are compatible with an even wider range of media since they don't heat the substrates. However, because of different wavelengths of the LED spectrum, these inks vary from conventional UV-curable inks.

*Bordeaux's Plasma UV-curable inks*

The progress in digital printing technology in the past decade is reflected in the availability of diverse ink types that are differentiated from one another. All these ink types – mild and low, eco-solvent and UV-curable inks – have created a demand for alternative, cost effective options that maintain the quality and productivity sustained by the original inks. To achieve this goal, alternative ink manufacturers have invested heavily in research and development of inks as well as in production upgrades resulting in very good quality inks which are significantly lower in price, saving the end users up to 40 percent on ink expenditure on all ink types.

Back in 2002, Bordeaux Digital Print Ink, a quality alternative ink manufacturer, predicted the tendency of the market and decided to invest in the generation of new inks that are more ecological, such as the mild and low, eco-solvent and UV-curable inks. Bordeaux's extensive experience in research and manufacturing of inks for a variety of digital printers and practically all types of print heads enabled the company to provide solutions for the most complex problems.

The main Bordeaux requirement for any new product was high quality ink, printing stability, sharpness, a wide colour gamut and high lightfastness of the prints.

The following year Bordeaux Digital Print Ink introduced light solvent inks for the Mimaki JV3 and converted Roland printers. This mild/light solvent ink was modified several times in order to improve jetting characteristics and print quality and Bordeaux's mild solvent inks adapted well to printers in all continents. However, the company did not stop here. Thorough studies conducted by the company's R&D team paved the way to solving the fundamental problem of keeping the nozzles wet by using slow evaporating and high boiling solvents yet enabling fast drying inks as demanded by the modern high-productive printers.

Bordeaux's R&D department succeeded in combining these two opposite demands by

*The Primo Eco range includes inks which incorporate Mix & Match technology*

developing a new series of inks – Prime PRMS for the Mimaki JV-3, JV-5 and JV-33 and for Roland printers. The physical and chemical characteristics of the new ink series are fully compatible with the Epson DX4 and DX5 print-heads. The drop behaviour on the substrate, its fixation and drying allow printing with PRMS inks without sacrificing printers set in high-speed modes. Furthermore, compared with the previous generation ink (PRJ3), PRMS features a significantly wider colour gamut (see figure below), matching OEM colors. The new ink composition as well as Bordeaux's bulk system for JV-5/33 printers eliminates the common starvation phenomena of the print-head.

In 2005 Bordeaux began the production of eco-solvent inks. This development took three years, and currently this product is considered as the best eco-solvent ink in the market, ensuring reliable printing and high quality prints. Inks are successfully used in the eco-solvent printers of Roland, Mutoh and others. The Prime Eco PENR, Bordeaux's eco-solvent ink solution was the first product in which the company implemented the Mix & Match technology (M&M) a Bordeaux proprietary concept ensuring complete chemical compatibility and color matching to OEM inks, Roland's Eco Max & Mutoh's Eco Ultra. It enables the user, during every stage of printing, to replace original ink cartridge with a Bordeaux Prime Eco cartridge on an individual level and to continue printing without any effect on the prints. The Mix & Match technology eliminates the need for cleaning/flushing and matches the original ICC Profiles. The concept of M&M has been expanded to include most versions of the PRMS for Mimaki printers and some versions of the UV-Curable inks, depending on the printer model.

Bordeaux has been producing its Plasma UV-curable inks' product line for several years and, recently, with the launching of new upgraded inks, production volumes are growing rapidly. The company offers several types of Plasma inks: The main product, Plasma PLFX, is characterised by very fast curing using low doses of UV radiation which successfully operates on productive high-speed printers and is suitable for printing on various media such as polymeric substrates (ABS, Coroplast, polycarbonate, polystyrene and PVC), canvas, fabrics, meshes, paper and many other rigid and flexible materials. Modification of this version is designed for printing on treated surfaces of polyolefin polymers (polypropylene, polyethylene). In addition, an LED version of UV-curable inks for Mimaki printers was developed and successfully tested. As mentioned earlier, in a number of UV-curable inks, Bordeaux has implemented the concept of M&M, which enable the use of OEM ICC Profiles.

Bordeaux Digital Print Ink focuses on the quality of its products. The technology of pigment grinding and dispersing in a liquid carrier, which was developed by the company, achieves ink dispersions with submicron particles and long storage stability as in the case of solvent-based inks, and UV-curable inks. In combination with the right approach to the formulation developments, this achievement provides reliable functioning of the print-heads. In the production process, Bordeaux Digital Print Ink uses only lightfast pigments that are incorporated into the precise formulation to ensure long life images printed with Bordeaux inks. Technological processes, which are constantly controlled for quality, provide uniformity of the product properties from batch to batch. ■

***Dr Oleg Dardik is R&D Manager at Bordeaux Digital PrintInk***

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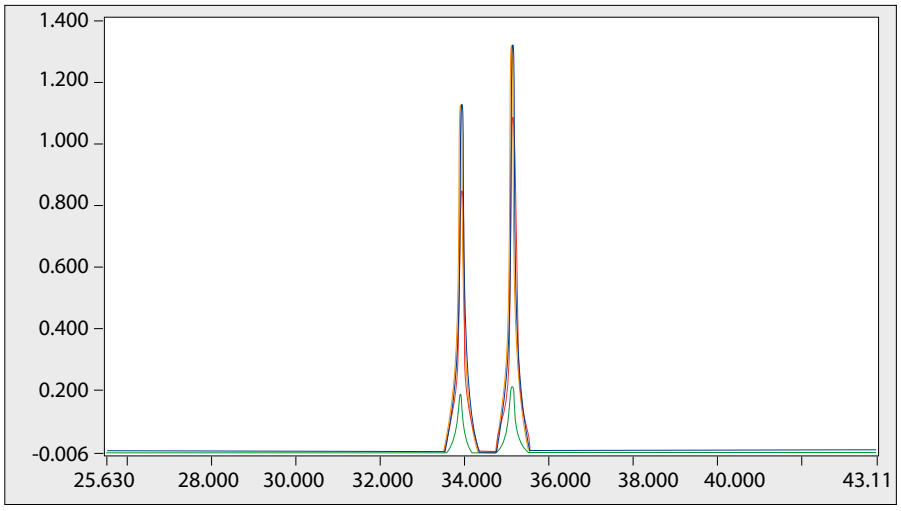
# UNDERSTANDING CURE RATES

## Michelle Adams discusses the variations in UV curing behaviour in screen-printing applications

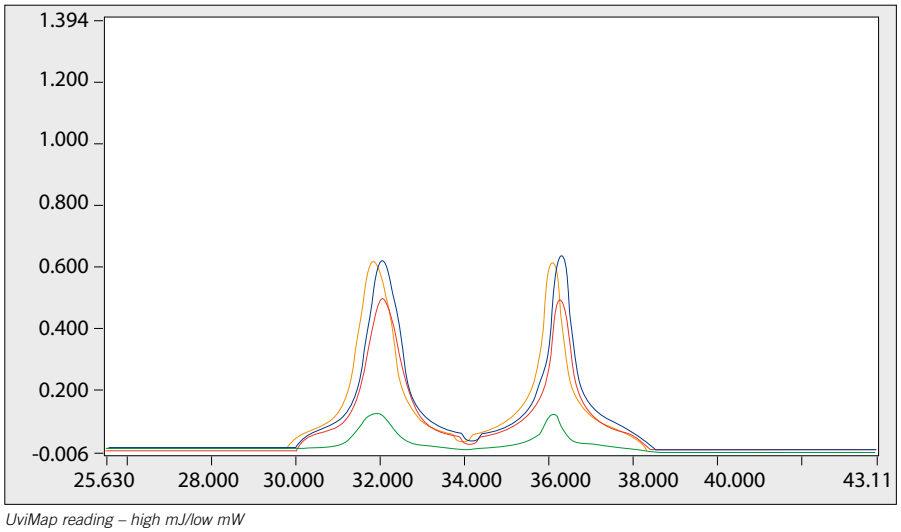
**During a recent conversation with an associate about all things screen-printing, he enquired as to what are the most difficult questions that I get asked. The answer came without hesitation: "Does this outfit make me look fat?" and "My boss wants to know what is the minimum number of millijoules that I need to cure this ink or run this job?"**

In truth, rarely does a screen-printer call in enquiring about their state of dress; however those concerning cure requirements are quite common and, like the previous question, there is no single, definitive 'right' answer; but there are a lot of wrong ones.

The cure rate of an ink is dependent on several factors: ink film deposit, or mesh count, material, the colour of the ink, colour rotation, and ink chemistry. For example, a medium yellow printed over a black will require considerably more energy (milliwatts) and a higher milliwoule output for full cure than it will if printed over a white or by itself; likewise a colour printed through a 380.33 pw mesh will require less energy to cure than the same colour printed through a 305.33 pw mesh. It is also important to note that certain colours, by their very nature, typically require more energy to cure than other colours. These include opaque white and blacks, most yellows and some oranges and reds. Colour matches which incorporate these colours such as greys, beiges, tans etc can be considerably more difficult to cure than each colour individually. Conversely, very flexible 'soft' inks, such as those used in the industrial graphics market for embossing and forming, are usually slower curing than their harder more brittle counterparts, and therefore require more milliwatts and millijoules for complete cure.




*UviMap reading – low mJ/high mW*




*UviMap reading – high mJ/low mW*

Another area of confusion, or more accurately, 'areas' of confusion that often arise with regard to cure rates and requirements are that of the role of post cure, and the difference between millijoules and milliwatts, and which is more important.

All UV inks will display some type of post cure behaviour; while the majority of the cure or polymerisation process happens instantaneously when the ink film is subjected to UV light, the polymerisation or cure process does not stop immediately once the part exits the cure unit. Depending on ink chemistry or series, the ink film will continue to cross link for the next 12 to 24 hours.

With the possible exception of freezing the part (although I wouldn't recommend this), this process will continue regardless of post press handling or procedures. For this reason, depending on the ink series, ink characteristics, substrate and end use processes or requirements, there may be different guidelines regarding post press handling. For example, if the ink series is one that becomes considerably more brittle as it post cures and requires a die cut through the ink film, it is usually recommended that the part is die cut within that 24 hour period. However, if it is an ink system which requires post cure for optimum adhesion, or if it is in an application with a high end long term requirement such as adhesive resistance, it is recommended to wait for 24 hours prior additional processing. The reason for this is due to the adhesion characteristics of UV inks.

While solvent-based inks typically adhere through a chemical bond, chemically etching itself into the substrate, UV inks adhere by means of a mechanical bond, by which they 'mechanically' hold onto the substrate, much like a fly 'holds' onto a wall. While a UV ink should pass a cross hatch tape test once it exits the cure unit and cools to room temperature, some processes such as applying adhesive, as well as the adhesive itself, can subject the ink film to a certain

degree of mechanical stress; if the ink film is subjected to this mechanical stress prior to complete post cure, the result can be a loss of adhesion or delamination of the ink film to the substrate. This failure is typically not immediately noticeable but tends to manifest over a six to twelve month period depending on factors such as substrate, ink film thickness, cure, etc.

With certain materials, such as top-coated polyesters, hard-coated polycarbonates and polyesters, as well as fire retardant coatings and materials, this post cure period becomes more critical as these substrates are generally more difficult to adhere to by the very design that makes them more robust for demanding applications.

Now that we understand that 'cure rate' is a variable based on ink film thickness, colour, series, etc, and that post cure can effect both the short and long term functionality of a cured ink, how can we identify and monitor the appropriate cure rate based on these variables?

A radiometer, or 'puck' is a very useful tool used to identify the UV output of a curing unit. Based on the manufacture or model, these units can provide information on all four UV bandwidths (UVA, UVB, UVC and UVV) or just one (most commonly UVA); they can show whether a unit is focused or unfocused, and help identify degradation trends in the bulb. These units can provide this information in both millijoules and milliwatts or just millijoules. Unfortunately, as useful and powerful as these little guys are, they can often create as much confusion as clarity.

The reason for this is that often millijoules is the only number discussed or supplied when addressing curing and cure requirements; however milliwatts is equally important (if not more so) than millijoules. It is quite possible to have a very high millijoule reading yet still under cure the ink. Millijoules is simply a more accurate way to describe the belt speed or dwell time of the ink under the cure unit or UV lamp. If the cure unit is not supplying enough energy or milliwatts to completely penetrate the ink film the number of millijoules becomes inconsequential.

It is important to remember that these 'tools' work best when they are incorporated into an ongoing monitoring and maintenance program; always check for cure and adhesion after every colour, whether by a cross hatch tape test, scratch test, or whatever method has been tested and validated by your individual company. It is much easier to identify, address and correct potential cure and adhesion problems at the beginning than it is to go back and try to 'save' a job.

Last but not least, work with and communicate with your ink and material suppliers, not only during a crisis of monumental proportion, but also when everything is sailing along smoothly as well (we really do like to hear good news, too).

Vendors and suppliers are a vast resource of industry knowledge, information and help and, when utilised, can be a valuable partner in the success and profitability of your company. ■

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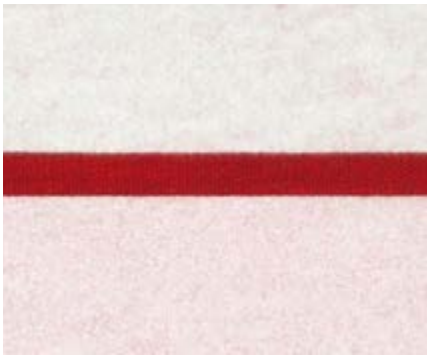
# PERFORMANCE BY NAME AND BY DESIGN

## Screen-printing onto sportswear can be challenging. Edward Branigan examines the idiosyncrasies of polyester fabrics

**Team sports' merchandise occupies a fairly large portion of the market-place these days and it is growing. In fact, the line between athletic sportswear and fashion is blurring. The advent of performance apparel with dry wicking capabilities, that actually draw moisture away from the skin, and the fashionable styles of the garments themselves, have given impetus to the trend. Yet the new breed of performance fabrics can be a nightmare for printers to print on.**

The original team sports' merchandise used to consist of copies of the team jersey, with supplementary products like hats and patches. These garments, shirts that were comfortable to wear and had a little stretch to them, and usually made of polyester or a blend of polyester and a small amount of spandex or Lycra, were screen-printed with the team logo or mascot in their custom colours. The development of performance fabrics not only changed the way that the polyester fibres were spun or woven but also what the fabric blends would consist of. A greater amount of stretch has become the standard. This has been achieved by adding greater amounts of stretchable components like Lycra, spandex and elasticine to the blends, as well as adding newer stretchable fabrics and technologies such as spinning the yarn in such a way that allow the polyester fibres to achieve a fair degree of mechanical stretch. Furthermore, the newer athletic fabrics are often chemically treated to help wicking and disperse moisture away from the body or treated to eliminate odour.



*This example shows dye migration or bleeding on polyester fabric*

Screen-printed applications on athletic wear always presented some very unique challenges. Dye migration or bleeding has been a common problem when printing on polyester fabrics whether blended or not. The stretchability of traditional team sportswear, where the Lycra or spandex percentages were only in the 5 percent range compared to 10 to 20 percent in today's performance fabrics, did

*An example of print on nylon using a catalyst*

*A print on performance fabric with elastic fibres using a stretch additive*

not present a major challenge. However, the chemical treatment of fabrics can affect the ability of some inks to seep into or grip the fabric fibres.

By far the greatest challenge for performance athletic printing is polyester dye migration. This usually happens after a garment has been screen printed and the ink is cured. The plasticiser in the ink 'pulls' the pigment molecules from the polyester dye into itself, most often changing its colour. This can become apparent immediately or may not become visible for 24 hours or two weeks, or even two months, after curing.

Polyester fabrics are difficult to dye. The most commonly used dyes are disperse dyes. These are finely ground and used with a dispersing agent. Temperatures from 85 degrees C (180 degrees F) to 130 degrees C (260 degrees F) are used. The heat and the fine particle size of the dye aids dissolution of the pigment and absorption by the fibres. The choice of dispersing agent used can also be critical as it affects the rate of dyeing.

Here's the problem for printers: The dye molecules don't always get fully absorbed into the fibres. They will wrap themselves around the fibres and stay there until they are subjected to high heat. Plastisol screen-printing ink needs to be subjected to at least 160 degrees C (320 degrees F) in order to cross-link and become fully fused. When the plastisol ink hits the 130 degrees C (260 degrees F) mark and, if the polyester fabric has been through an inadequate dyeing process, the plasticiser in the ink will pull the loose dye molecules up into itself. This is particularly acute on red polyester shirts that have been printed with white ink. In such cases, the white ink can turn pink within hours, days or even weeks after the job has been printed.

There are several ways to combat this problem. (The 'combat' metaphor is appropriate because in many ways it is a war of attrition.) Most ink manufacturers and print production companies are not involved in fabric manufacturing or dyeing, so have no control or efficacy over the process. Dye houses or mills also guard their secrets, so gaining access or knowledge of processes or formulas is difficult or impossible. The variables that ink makers and printers do have some control over are the ink itself and the application process. The inks can be modified to resist dye migration. But although bleed blocking agents can be added they are not always 100 percent effective. There are several low-bleed white plastisols on the market today with excellent bleed blocking capabilities but even these can sometimes be usurped by a rogue polyester dye.

To complicate the matter further, the issue of fabric elasticity and the solutions developed to print on it have a direct effect on a bleed resistant ink's efficacy. There are some very effective stretch additives on the market today and an 80/20 poly/spandex blend can be printed and washed without the worry of the ink film cracking. However, when an outside agent is added to a bleed resistant ink, the ink's ability to block dye migration is compromised.

Yet another arsenal for the printer to counteract bleeding are additives that allow the printer to lower the cure temperature of the ink. With low-bleed additives, the curing temperature of the ink can be lowered to 275 degrees F (135 degrees C), just about the threshold for dye migration to occur. In many cases, this can keep the dye in place while allowing the use of the stretch additives to maintain print quality.

The best that printers can hope for is to keep the dye genie in the bottle most of the time. It is extremely critical that testing is done prior to production, not least because athletic or performance fabrics are more expensive, but also because dye migration can be elusive and can sneak up seemingly out of nowhere. Be prepared! ■

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# HOW COLOUR MANAGEMENT HELPS TO REDUCE COSTS AND TIME IN WIDE-FORMAT DIGITAL PRINTING

## Getting it right first time is straightforward, as Wolfgang Passler explains

**In every area of business, costs can be split into fixed and variable amounts, and these criteria are just as important in wide-format digital and industrial printing. Fixed costs include the machines used, the premises and other elements which do not change no matter how many prints are output or sold.**

On the other hand, variable costs place a significant influence onto the price of every single print, and these rates vary based on the numbers of prints and individual jobs carried out. Some of these variable costs apply to the media used, the ink employed, and not only the operators' time but also that which is taken up when the printer is not actually working because of the set-up process.

Colour management can now play an integral role in reducing these variable costs, in particular those relating to ink, media and the time taken up by the operators and printing machines.

Ink, no matter whether it is UV-curable, solvent-based, water-based or latex, provides the cost factor which is overall the most crucial element – and this is where the cost savings can be most effective.

Ink saving using colour management is achieved via optimised GCR. This is the abbreviation for grey component replacement and represents a separation technique where black ink is used to replace a portion of the unwanted component within a saturated colour. It also replaces greys, conventionally made with three colours, with black.

There is software available which is able to create an ICC profile with 'Ink-Saving' (optimised GCR), and this is called Profile-Xpert Print Pro. For a free trial this is available at www.Profile-Xpert.com.

The parameter used by GCR determines to what degree the black ink is employed to replace cyan, magenta and yellow. This parameter can be defined individually according to the needs of the operator. The higher the GCR is set, the more ink will be saved.

However, there is another side to the coin. If the GCR is set too high the print will become flat and lose its structure. Therefore, it is important that the right levels are achieved by finding and using the middle ground which provides the greatest savings whilst retaining the quality required. This depends mainly on the media used and the kind of image which is being printed.

For example, an image is separated into the four standard channels of CMYK and the ink coverage is measured on one point. We can gain an ink saving of total 30 percent in cyan, magenta and yellow simply with an increase of 5 percent on the black only. This leads to an average ink saving of 25 percent overall.

### SAVING INK

Using figures taken from a printing company using Barbieri colour management equipment, there was a 25 percent saving of ink. An average UV-curable printer has a consumption of approximately 500 litres/year. The cost of the UV-curable ink is approximately €100/litre, and this results in yearly expenditures of of around €50,000 on ink for each printer. Saving 25 percent on ink consumption results in some €12,500 for each printer.

*Saving costs and time are important*

*Ink savings are achieved by using the optimal levels of GCR (grey component replacement)*

## SAVING TIME

Another consideration is that, due to the correct results being achieved immediately, along with automatic and fast measurements, time is also saved.

If colour management is applied in the right manner and the whole work-flow is carried out, including linearisation of the printer and creation of the ICC profile for the media, then the desired colour and its true output will be reached immediately. Because of this, no multiple sample prints have to be printed in order to come incrementally closer to the desired colour appearance which would lead to wasted operator and printer time. The right results are achieved first time. Furthermore the calibration process only has to be done once for each media, as long as the colour output remains stable, and not for each print job.

By means of an automatic measuring device, known as a spectrophotometer, during measurement the operator can give his attention to other tasks and is not occupied by carrying out this process manually.

## SAVING MEDIA

Again, because the right results are achieved first time and are instant, by applying colour management in the right manner, media isn't wasted as multiple sample prints are no longer required.

Printing companies who apply colour management will save time and costs and also spend far less time having to produce reprints because they will receive fewer customer complaints, if any, about the wrong colours appearing in the job. Getting it right first time saves on costs and time. ■

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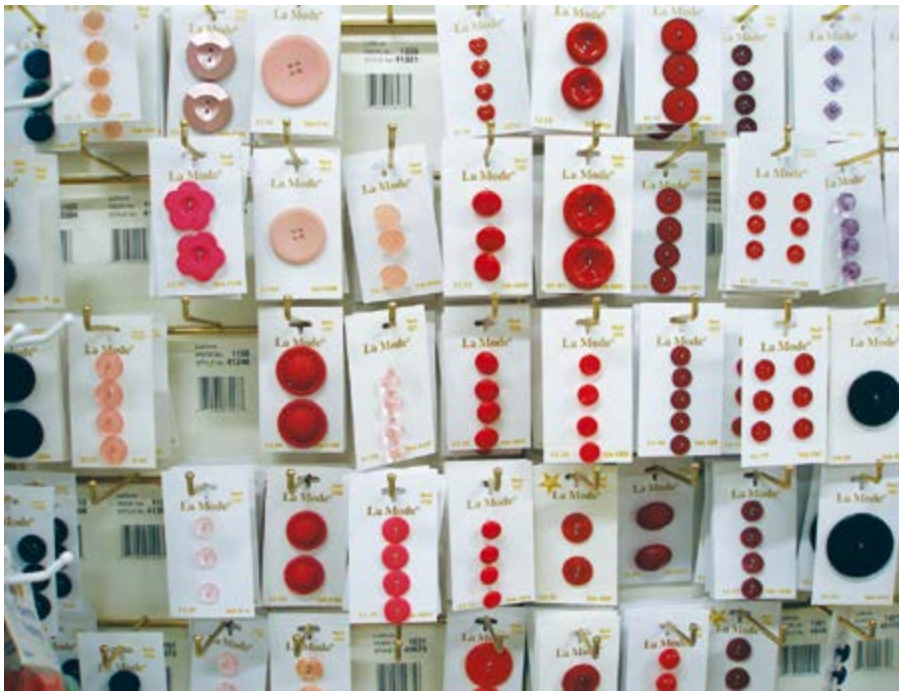
# SIMILAR IN APPEARANCE ISN'T NECESSARILY A MATCH

## New ideas are always exciting, and Bruce Ridge outlines why this is the case with the G7 colour control method



*Matching colours is normally not exact. Replacing a button on a shirt or coat is a common example of this*

*These Pantone Bridge books are all the same type and age of book. But, due to variations in the manufacturing process, there will be an acceptable deviation in the colours expressed in a Delta E tolerance*

**It is almost four years since we had Mike Ruff and Tony Quinn go to a conference where they were introduced to the G7 colour control process. This was revolutionary in some respects, but very familiar in other ways. As a consulting group, we had been practising a successful modified method of generating curves for screen-printers that we called the hybrid curve. This was a method where we would generate a curve similar to the method used by offset printers, but it was modified by using a combination of dot gain and density measurements in order to compensate for the extreme colour variations that common screen-printing substrates would bring to a four-colour print. The hybrid curve also compensated for highlight dot loss as well as increased solid ink density levels.**

This G7 method was developed by Don Hutchenson who applied the same colour control methodology he used as a scanner operator throughout the entire printing process. This was achieved by balancing an image to a targeted level of grey balance instead of to targeted levels of solid ink density and dot gain values. This was revolutionary since this was a change in the accepted colour control practices that had dominated all four-colour printing for more than 30 years. At this point, the G7 methodology was designed for and used only by offset lithography printers.

This is what got Mike and Tony so excited. They thought this G7 process may be working great for offset litho, but they knew it would help the screen and ink-jet printers even more. In consulting, they were constantly battling the variation the commercial screen and ink-jet printers were trying to overcome when their substrates were not close to being white like a proof, and their durable inks were made with pigments that were different from the pigments and dyes used in non-durable proofing systems.

The G7 process offered a way to control colour to achieve a similar appearance, even when the substrates were different, the solid inks were different, the resolution was different, and the format was different. It was our belief then, and is proven now, that this was obviously something that would benefit screen-printers and wide-format ink-jet

*The Farnsworth Munsell 100 Hue Test is an industry standard for testing the colour perception in individuals that have to discern slight differences between colours in their jobs*

printers who were constantly fighting the differences in print to proof.

For our consulting practices, G7 is the primary methodology to control four-colour printing in screen, ink-jet, flexo, and offset litho. For the last three years Mike has brought this practice to the SGIA's process colour training program where he is one of the instructors. At the start of this year, the SGIA acknowledged that the G7 methodology is the preferred colour control method for screen and wide-format ink-jet printing. IDEAlliance, which is the governing body of the G7 process, has enlisted the expertise of SGIA to create the screen-printing training segment for its G7 Certification Program.

In order to implement a colour control system that is a departure from accepted industry practices for the last 30 years, we have to make changes. Some of these changes are easier to make than others. When a printer sees the improved efficiency and speed to colour, they start to appreciate that change is necessary. On the other hand, some of the basic practices are the most difficult to change. This brings me to the main point of this article. The G7 colour methodology is based on the concept of achieving a similar appearance – not a match, but a similar appearance.

For years the crafts' people in the printing industry have made the claim that they can and will 'match' a colour or a proof in the print reproduction process.

> *The word match (n) means a thing equal to or similar to another*[1]

> *The word similar (adj) means having characteristics in common : strictly comparable. Not differing in shape but only in size or position*[1]

Equal to is different from similar to. Technically the term 'match' can be synonymous with similar. But that is where the similarity in the terms ends. This becomes an issue when the expectations of the buyer is 'equal to', and the provider is expecting to deliver 'similar to', which is most likely the scenario. It is also likely that the person that promised an equal to match (sales), is not the same person that has to actually deliver the goods (production). The person that is reproducing the match will eventually come to the conclusion that the result they have is as similar to a match as they can get, given the constraints of time, materials, and equipment they have to work with.

## MATCH AND SIMILAR APPEARANCE

The concept and tradition of matching colour in printing applies to the process of reproducing one specific colour, known in printing as a spot colour ,as well as to full colour photographic images. It is a common occurrence for a printer to be asked to match a spot colour like Coke Red, Fed Ex Orange and or any of the Pantone Matching System colours. These are colours that give printers very specific targets to hit, reproduce, or 'match'. It is much easier for the eye to compare one solid area of colour to another solid area and perceive subtle differences. This is why colour tests are based on solid colour comparisons.

There are several ways to develop numerical and visual tolerances for a specific colour. Before I describe those methods, let me first define tolerance.

> *The term tolerance (n) is the allowable deviation from a standard, the range of variation*[2].

So, once we start talking about tolerances, we have already conceded to a deviation from the target. Then the issue is, how far from the target is acceptable. There are two primary methods printers use to define tolerances when reproducing a spot colour. The most common method is to use a deviation number or a Delta E (dE) number to quantify the difference. A Delta E number is figured by a

*Continued over*

mathematical formula that compiles several different characteristics of a colour as compared to the target colour, and summarises those differences into one number. Usually the basis of this system is that a Delta E of 1 or less is visually undetectable by most people. This mathematical formula is based on research on how most people perceive colour differences.

The second method is to create actual colour samples with slight deviations from the target colour. This would be a visual system which is much more time consuming to generate, yet is much more accurate in relationship to the colour being reproduced, as well as to the individuals that are approving the colour.

No matter which approach is taken, it is common for spot colours to be reproduced on the same media or substrate using the same inks that will be used in production. This brings these colour reproductions much closer to 'matching' the original. In these cases, the tolerancing is almost more important to represent the deviations that will take place during the course of the reproduction run, and these will occur.

When it comes to matching a full colour (four-colour process) image, there will almost always be only one target or proof to simulate/reproduce. That one image will contain hundreds of colours. It is far more difficult for the eye to isolate just one colour within that image to determine if that particular colour is similar to the given proof. Obviously isolating and comparing one specific area in a full colour print to the proof can be, and is, carried out. An example is the print job where a sweater in the photograph needs to match a real sweater in colour which may be stacked near the printed image. In these cases, it may be difficult to get the flesh tones truly accurate while also achieving the exact sweater colour, if colour is being adjusted on press in a process like screen-printing where colour adjustments on press are global. Not only do all four colours need to be printing exactly right in order to achieve an exact colour reproduction, but the proof/target will likely need to be made from different components as the print – so different in the fact that the key colour building blocks will rarely be the same. The ink, media/substrate, resolution, dot type, gloss level and format will all probably be different. These differences make it downright impossible to 'match' the proof if we are honest about it. That is where it is most practical to achieve a 'common appearance' with the proof.

*When proof and print are composed of different elements, the best result is one of a 'common appearance' as targeted in G7 methodology*

Once printers venture into multiple printing platforms for projects where the same image is printed by different print processes, at different resolutions and in different formats, it is simply highly unlikely that these images will 'match'. Therefore working to achieve a 'common appearance' is the more realistic goal.

## ADOPTING A NEW PRACTICE

The G7 method of colour calibration is a better method for screen-printers to target print to proof because the focus is to move away from the concept of 'matching' the proof with solid ink density, and dot gain or tonal value increase targets. The G7 methodology states the goal is in achieving a 'shared appearance' and 'common appearance' when comparing the print to the proof, and print to print, as in cross-platform printing campaigns. G7 will move this thinking to an adopted practice. This will be necessary to be able finally to achieve acceptable colour prints quickly when all the elements of the print do not 'match' up such as substrate, ink, resolution, and format. Not only is this important for cross-platform printing applications, but this is the final untapped element in delivering maximum efficiency to the colour reproduction process by targeting neutral grey values in the primary parts of the image. If colour images are separated and balanced based on achieving a neutral grey within an image, doesn't it make sense to make press adjustments to achieve that same grey balance within an image? This way the image content will be similar, even if the substrates and inks are different. This is the basis of G7 colour control, and the reason G7 makes so much sense for screen and ink-jet printers to implement. ■

***Bruce Ridge is Director Technical Service at Nazdar Consulting Services***

**CIE76**

Using $(L_1^*, a_1^*, b_1^*)$ and $(L_2^*, a_2^*, b_2^*)$, two colors in L*a*b*:

$$\Delta E_{ab}^* = \sqrt{(L_2^* - L_1^*)^2 + (a_2^* - a_1^*)^2 + (b_2^* - b_1^*)^2}$$

$\Delta E_{ab}^* \approx 2.3$ corresponds to a JND (just noticeable difference)

*This Delta E formula is one of several which takes into account the differences in value, hue, and saturation when comparing two colours*

**References:**

[1] Definition of match is from Merriam-Webster on-line dictionary.

[2] Definition of tolerance is from Merriam-Webster on-line dictionary.

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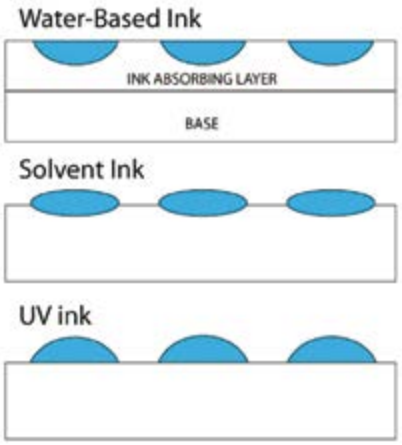
# THE ADVANTAGES OF FLEXIBLE UV CURABLE INKS

## Timo Keersmaekers discusses the potential of the VersaUV's capabilities

**UV (ultra violet) ink cures, or dries, under the influence of radiation, namely ultra violet light. It is a relatively new development in ink-jet that is not yet fully established on the market. UV-curable ink offers a variety of benefits for digital printing, but eco solvent inks are also indispensible.**

### A BRIEF HISTORY

UV-curable ink is relatively new in digital printing. The first printing inks were water-based and the demand for outdoor applications and options for printing on uncoated material led to the development of solvent inks. UV-curable inks were developed later and, in the beginning, these inks were inflexible, so that it was only possible to achieve high quality prints on plate materials. The ink would tear if it was used to print on film. This shortcoming led to the development of flexible UV-curable inks which can be printed on rolls and processed afterwards without giving any problems.




*Comparing the absorption of water-based, solvent and UV-curable inks*

### COMPARISON BETWEEN WATER-BASED, SOLVENT AND UV-CURABLE INK

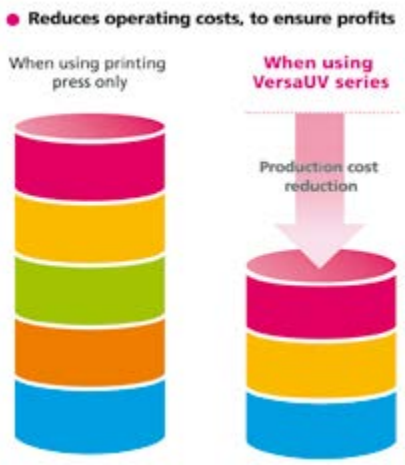
Water-based inks are printed on a substratum with an ink-absorbent layer (coating). The ink adheres to the material by attaching itself to the coating. Solvent inks can be used to print on materials that do not have coating, such as film or banner. This ink binds with the material by fusing with it. UV-curable inks can be used on nearly any background. This ink does not require drying time, as it immediately hardens under a UV lamp. The ink is not absorbed by the material but remains on the surface.

### ADVANTAGES OF UV-CURABLE INK

One of the greatest advantages of UV-curable ink is that it can be printed on almost any substratum. It can also be used to print on a wide range of environmentally-friendly materials such as paper, PP and PE. The ink dries out directly, so that the prints can be used immediately or processed further. Prints with flexible UV-curable inks can also be folded and stretched without breaking. They are highly scratch-resistant and their colour range is at least as large, if not larger, than that of eco solvent inks. The range also includes a quality white UV-curable ink with high opacity.

In addition to all this, Roland DG's (eco-UV) UV-curable inks have yet another special feature: Roland DG also has a transparent ink, or clear coat. Depending upon the lamp's settings, it produces either a glossy or matt look. This transparent ink can also be used to print in relief by printing layers of ink on top of each other at certain places.

Roland DG's UV-curable inks do not release any ozone as they harden, because only they only use light within the UV-A range. No ozone is produced as a side product with this light frequency, in contrast to UV lamps that fall within the UV-B and UV-C range.



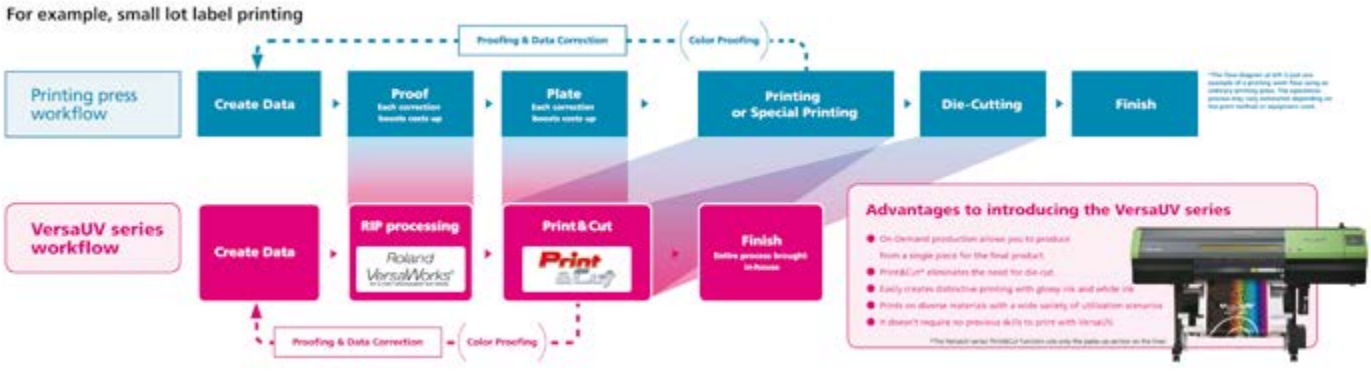

*Cost reduction when using a VersaUV printer instead of a traditional press*

### A FEW POINTS TO CONSIDER

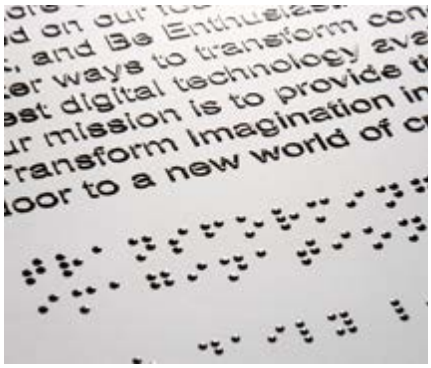
UV-curable ink is more high maintenance than other inks, but this can mostly be solved by a good maintenance system in the printer. It is also necessary to install an extraction system if you use a UV-curable printer. This is also necessary for hard solvent printers. A third disadvantage is that the life span of some applications is shorter than that of solvent inks.

### HARDENING OF UV-CURABLE INK

Typically, UV-curable digital ink is hardened when exposed to mercury arc lamps. Roland DG, however, has developed UV-curable printers that use LED lamps to harden the ink. They do not require warming up and cooling down time and produce very little heat. There is, therefore, no risk of fire if the printer head




*Comparison of the workflow of the VersaUV and a traditional press for small lot label printing*




*Braille and other tactile finishes can be created by layering the transparent UV-curable ink*


*These leather purses have been printed with the VersaUV*

crashes and the materials don't shrink, discolour or become misshapen. Furthermore, Roland DG's LED lamps have a life span of approximately 10,000 hours, five to ten times more than that of traditional halogen lamps. During production, our machine used less than 370W. Conventional UV-curable printers use ten to 20 times more energy.

*The flexibility of the ink means that operating panels can be produced successfully*

*High gloss finishes can be output from the VersaUV*

*Examples of textiles and wall coverings printed using Roland's UV-curable ink*

## ROLAND VERSAUV: UV-CURABLE PRINTING AND CUTTING WITH JUST ONE MACHINE

Roland DG launched its first UV printer in 2008. The VersaUV LEC-300 was the world's first UV-curable printer which also functioned as a cutter. The company has received many awards and wide-spread recognition for this machine. In 2009, the company launched a second model, the VersaUV LEC-330. It is based on the technology of its predecessor, but has been optimised in various areas so that, in addition to prototyping, it is also perfect for producing small series and batches. Both machines have a printing width of 73cm and use six colours of CMYK, white and varnish. There are also versions with five colours which have a channel for double white or double varnish.

## APPLICATIONS FOR UV-CURABLE PRINTS

UV-curable prints have diverse applications. UV-curable printers are often used to print aluminium and plastic plates. Roland DG's UV-curable printers target three specific markets: packaging, labels and special applications.

## PACKAGING AND LABELS

Roland DG's LEC-330 makes realistic prototypes and packaging proofs. The prints have the look and feel of the final product, because the machine prints on materials that will actually be used during the production of the packaging. As we mentioned earlier, the LEC-330 uses flexible UV-curable inks that dry under light from LED lamps. As they do not produce heat, printing on heat-sensitive materials, such as shrink film, will not present any problems. The LEC-330 also prints on PE, PET, BOPP, self-adhesive PVC, paper and many other materials.

Other advantages of the LEC-330 are the speed with which it can make prototypes and the accompanying low costs. It is very fast because the designs are made digitally and can be sent directly to the printer. This enables designers and decision takers to evaluate the results in less than half an hour. The solutions currently on the market can print true to colour, but not on the final materials. Therefore design tests and mock-ups do not look realistic.

The LEC-330 is also perfect for producing small series, with variable data if required. Outsourcing is no longer necessary. Making plates and films will also become a thing of the past. Furthermore, the LEC-330 can print and cut a design quickly, right down to the smallest details. The fact that it is no longer necessary to make extra dies or cutting formes is an added benefit for label and packaging manufacturers.

## SPECIAL APPLICATIONS

Roland DG's UV-curable machines are also perfect for use as touch panels for printing. Because flexible inks are used, the ink does not break if a button is pressed. It is also possible to print in relief with different layers of transparent ink able to be applied on top of each other to create textures. It is also possible to print text in Braille in this way.

Transparent ink can also be used to create a luxurious effect by highlighting certain parts of the print. As mentioned earlier, it is possible to obtain both a matt and gloss effect, depending on the lamp's setting.

Finally, UV-curable ink can be used in many different ways. For example, it is possible to print on both real and artificial leather. Printing on wallpaper and textiles is also amongst the possibilities.

## UV-CURABLE AND ECO-SOLVENT CO-EXIST IN HARMONY

As this text show, UV-curable inks have many advantages. However, eco solvent inks also have an important role to play in the world of digital printing. These inks are still the best option for a variety of applications, in terms of price, quality and speed. For packaging, labels and special applications, however, Roland DG's UV-curable printers are the perfect solution. ■

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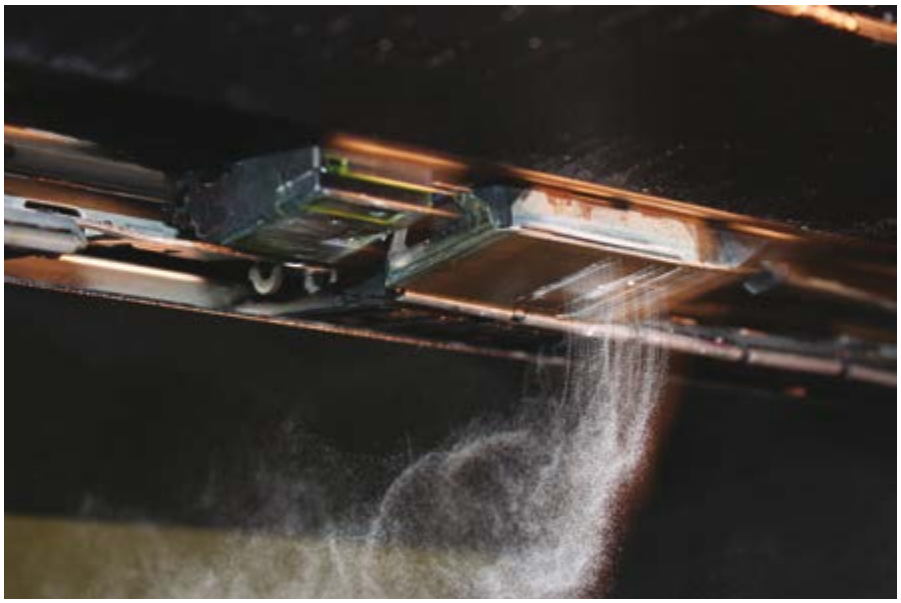
# PRODUCTION READY INK DELIVERY FOR SMALL AND MEDIUM SIZE DIRECT-TO-GARMENT PRINTERS

## Brett D Weibel discusses the behaviour of ink systems



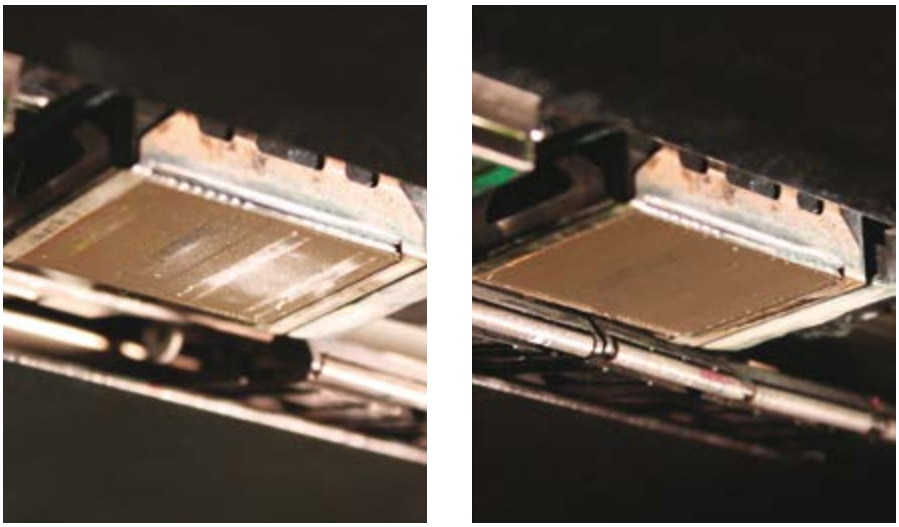
*This picture shows abnormal jet over-spraying in action*

**Today's small and medium format direct-to-garment printers have several hurdles to overcome if they are to be used in a production environment. The vast majority of these machines are currently used in owner/operator type of businesses; however we see a growing number of companies utilising them for continuous production in a factory setting. The owner/operator is likely to accept some jettability issues and work with a machine which requires ink cleans and charging occasionally. The industrial plant manager cannot operate efficiently if there are irregularities in the ink delivery process of the direct-to-garment machines. In order to operate these machines in the industrial setting, it is vital to deliver the aqueous textile ink to the print-head in a consistent and predetermined fashion.**

Many current direct-to-garment machines on the market have open bulk feed ink delivery systems which cause ink jetting problems and individual ink nozzles to drop out. Open systems can cause the ink to change its viscosity through evaporation as well as to film over in their containers, allowing the dried ink particles flow into the ink lines and print-head. Manufacturers of these machines have gone to great lengths to improve jettability of the textile inks with moderate results. Elaborate circulation systems, flushing routines and vacuum pump devices have all been implemented to improve the condition of the ink as it is delivered to the print-head from these open type systems. In order to alleviate the issues with the open bulk feed systems it is necessary to look at the design of the original ink delivery system as intended by the print-head OEM.

All OEM printer manufacturers (such as Epson, HP and Canon) use closed ink delivery from the cartridge to the print-head to ensure that the fluid conditions which each nozzle is subject to is consistent and uniform. The three main factors, amongst many, which are crucial when designing a closed ink delivery system comprise the particle consistency, the dissolved gas level in the ink and the ink bag.

The most beneficial process in the textile ink packaging is proper filtering. Many distributors of garment inks do not filter, or filter in a way that has no mechanical benefit for the ink. Inks are delivered to in 20 litre, or larger, containers in a condition which makes the particle size vary. Most reputable ink manufacturers will dictate a minimum specification on a last-chance filter before packaging for distribution to the end user. Mishandled ink, and the general nature of the ink binders to settle and clump together over time, have led to the necessary process of filtering. Some end users may even have used coffee filters which can introduce particles into the ink, reversing the effect which they are trying to produce. This has long plagued the infant direct-to-garment industry. Proper filter plus pump selection is a science in itself and requires expert consultation from companies in this field.



*The effects of abnormal jetting of ink (left) and the print-head nozzle plate using proper jetting of ink (right)*

Pall Corporation and Whatman Ltd are both leaders in filtering technology and have a wide selection of micro-filter media for applications such as this. Each package type and size will have different filter applications.

Equally important to filtering is the process of degassing the ink. To understand the importance of degassing we must first look at the problems which entrained gases cause in the print head. Each drop of ink is formed when a piezo element pushes the ink through a small orifice in the bottom of the print head. In order for this drop to form properly the ink must form a concave meniscus (or cup) over the orifice. Entrained air in the ink can cause problems with the formation of this meniscus affecting jetting. Also, air bubbles/molecules weaken the pressure at the piezo-electric nozzle element which causes ink not to jet properly. Air bubbles can block a nozzle completely or cause cavitation in the ink delivery system which results in faulty nozzle operation. In order to alleviate the problem of air bubbles and gases in the ink, an ink distributor should have its ink degassed and packaged in a closed, air tight bag. Degassing techniques vary greatly from drawing a vacuum on the surface of the ink until all of the gas is removed, to passing the ink across a membrane with a vacuum applied to it which removes gases as well. The end result of degassing the garment ink is to remove at least 77.5 percent of dissolved oxygen molecules, which are found in all textile inks in their manufactured state. Once the gases have been removed from the ink, it is imperative to pump the ink into a closed bag immediately. Degassed ink left open to the air will 're-gas' itself, or absorb air molecules from the atmosphere.

The ink bag is the third item to consider when considering a closed ink system. Bag material must be made from a 'barrier' grade material which will not allow gases to penetrate the material after it has been filled with ink. Many types of plastic films are impervious to liquid transmission but can allow gases to penetrate through to the contents. It is important to the end user that the company filling the closed bag specifies the proper grade of plastic film when designing the closed system. This material is the only barrier keeping the ink from re-gassing itself. Many metallised Mylar films are perfect for this application, thus these bags are readily available. Many cartridge manufacturers automatically incorporate this style bag in their empty cartridge. Since most direct-to-garment machines are designed as custom machines, it is optional whether a bag with or without cartridge is used.

Selling the closed ink system in a bag without the cartridge is the preferred option which can save the distributor and/or end user some money. Cartridge systems can cause issues with air bubbles in the ink lines when the cartridge is removed to agitate (or shake) the garment in so as to keep the pigments suspended. A bag alone is usually attached via long ink tubes which allows the bag to remain connected to the ink delivery system while it is agitated; there is no chance of air being introduced this way.

Also, when the ink is packaged in a loose bag it may be preferable to source a clear bag material so that the end user can see the colour of the ink and the volume of ink left in the bag. There are many other advantages and disadvantages in the bag in or out of a cartridge; an end user should ask questions of his ink distributor in order to ascertain whether he is receiving the proper quality ink for his specific machine.

While these techniques are widely used in larger format and solvent-based machines, they have not been utilised in the direct-to-garment market on a large scale as of yet. As this side of the industry grows and more machines are used in production environments, we will see the ink delivery system become an area of greater importance in each manufacturer's research and development budgets. ■

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# SHORT-RUN COLOUR PRINTING, LONG TERM VISION

## Print shops can now bring short-run on-demand colour jobs in-house. Rich Egert explains how businesses can increase their revenue opportunities

**To remain successful in the colour graphic arts and production industry, companies need to address a changing market. Company logos and colour accuracy are extremely important for branding purposes and must be consistently met with every job. However, that alone won't keep you in business long term. Today, many print shops don't have the ability to produce professional-quality short-run colour output with the consistency needed to sell the prints. Consequently, many will forego the opportunity or may outsource projects when the quantity is small - that's a big mistake!**

As the marketing world continues to evolve, the need for high impact personalised pieces continues to grow. Businesses have migrated from generic mailers to colourful, customised materials with personalised messages. Mailboxes are filled with junk mail. It's the high impact personalised pieces that will actually be opened, such as an envelope that displays a consumer's favourite vacation spot with his or her name written in the clouds or written in the wet sand. The remaining non-personalised pieces are simply thrown out.

As these trends continue, the need for highly versatile, digital colour printing products which can produce personalised full-colour output in runs as short as one will continue to increase. This is where digital technology can separate itself from the capabilities of the presses and techniques of the past. Where marketing companies can separate their clients from the masses of non-personalised, nondescript bulk mail. It's also where print shops of today can establish themselves as an innovator and leader in their respective geographic markets for their future.

By adopting these new low investment technologies early, businesses can capitalise on new revenue streams previously only available to those willing to invest in the very high end digital products. Manufacturers can now bring short-run colour printing in-house for increased flexibility and print on-demand.

With the innovative technology of the OKI proColor series, print shops can affordably bring short-run on-demand colour printing in-house to expand their business and increase revenue opportunities. The revolutionary line of cut-sheet and web printers is ideal for short-run colour applications – and all at affordable price points.

With the pro900DP digital colour press, users have the ability to produce variable data on a wide range of cut sheet media, including a full compliment of envelopes up to 30.45 x 50.8cm (12 x 20 inches), utilising OKI's single pass colour technology. With the ability to support variable data graphics, each piece can receive a personalised touch. The pro900DP digital colour press is powered by an embedded EFI Fiery controller, delivering unmatched colour accuracy and a robust list of capabilities normally only seen on very high-end digital systems.

*The OKI pro900DP, which comes with an EFI Fiery controller, has the ability to produce variable data on a wide range of media, including full-colour envelopes.*

*The OKI pro510DW label and tag printer is a low cost alternative for short-run continuous web printing, producing up to 85,000 per day with the ability to print variable data*

Helping print shops expand into the colour web market, the compact and easy-to-operate pro510DW digital colour web press supports paper, labels and various tag stocks and includes automatic cut and reload between print jobs to eliminate operator intervention. With its ability to print on 31.75cm (12.5 inch) width and high speed roll-to-roll, the product offers strong capabilities in such a compact size and at an affordable price point.

The proColor devices allow businesses to expand their print offerings and compete competitively in the short-run colour space. These devices also allow businesses to alter their supply chain, reduce waste, and increase flexibility versus outsourcing label and tags. Both the pro900DP digital colour press and the pro500DW digital colour web press produce output on a variety of media types and provide the flexibility to print short-run colour from one to several thousand.

These colour printing devices are available nationwide through #1 Network dealers, www.number1network.com. ■

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# THE IMPORTANCE OF ACHIEVING FOGRA CERTIFICATION

## Claudia Bauer emphasises the relevance of standardisation in today's printing industry

**The German Federation of Industrial Research Associations (Arbeitsgemeinschaft industrieller Forschungsvereinigung/AiF) has launched a number of research and development projects aimed at cutting costs without compromising quality.**

These projects are sponsored by the German Printing and Media Industries Federation (Bundesverband Druck) and the German Printing Institute (Deutsche Institut Druck/DID). These activities are driving standardisation for offset printing, flexographic printing, intaglio and screen-printing.


*Marabu's Ultraboard UVBR inks have been tested in accordance with ISO-2846-4*

### THE ISO 12647 SERIES OF STANDARDS (FOR PRINTERS)

The ISO 12647 series of standards, developed and published by the International Organisation for Standardisation, applies to printers and describes processes, process parameters and tolerances for various printing methods and processes.

ISO 12647-2 and ISO 12647-3 are based on conventional workflows (i.e. film-based workflows), and are rooted in the process standard for offset printing.

This standard defines the parameters for print proofs and print runs.

### THE ISO 2846-4 STANDARD (FOR SCREEN-PRINTING INK MANUFACTURERS)

ISO 2846-4 addresses manufacturers of screen-printing inks, and defines the colour and transparency of printing ink sets for four-colour printing. The standard describes a method for testing process colour inks to ensure conformance, and defines the substrate to be used in testing. The test is conducted using standardised parameters and a standardised dot gain curve. The 2846-4 series of standards has replaced Euroscale.

By complying with ISO 2846-4, the ink manufacturer enables screen-printers to comply with ISO 12647-5 (for screen printing) and ISO 12647-2 (for offset printing) when a standardised, defined dot gain curve is used. This allows printers to achieve highly consistent printing results, no matter what printing method is employed.

Defining and complying with standardised parameters, including dot gain curves, are both essential for achieving consistent printing results. This applies to all workflows – from the initial layout, to pre-press, through to the finished product.

Agencies have also started using Fogra certification, especially in the offset printing space, for selecting printers. By choosing Fogra-certified printers, they can rest assured that materials printed in different locations using different methods will be highly uniform.

### MARABU IS CERTIFIED BY FOGRA

Marabu is the first manufacturer of screen-printing inks to be officially certified by Fogra. Its Ultraboard UVBR inks have been tested in accordance with ISO 2846-4. ■

***Claudia Bauer is Product Manager for Graphic Screen Printing at Marabu***

fogra cert

Ink colour | 24100

*The Fogra certification logo*

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# CUTTING COSTS AND TIME

## Alternative technologies can bring greater energy efficiencies as Mike Bacon discusses

**Businesses are continually looking for ways to identify cost savings and implement energy efficient solutions. Screen-printing companies specialising in flexible membrane switches (flex circuits) are no different in their approach to screen-printing and die-cutting their stable of products. As capital expenditures begin to loosen, equipment manufacturers are hard at work to design and build equipment that directly addresses the bottom line. It is back to the basics for many equipment manufacturers who are busy looking for technology advancements and innovation. Now is the time to develop a new way to produce the same product that will save any company significant money.**

### CONTACT DRYERS V TRADITIONAL AIR DRYERS

There are many applications where traditional air drying systems continue to make for a good investment. They are typically 15 percent cheaper than contact dryers, which is a deciding factor for many businesses. However, when you peel back the benefits of the contact dryer over traditional air drying equipment, the initial investment savings quickly go away.

Conventional air drying ovens blow heat over the surface of a web or sheet of material. In general, inks harden by drying, or evaporating the solvent out of the ink. There are three factors that contribute to how fast they will dry using an air dryer; temperature, amount of air flow and air humidity. A contact dryer uses a heated platen along with surface air assistance to dry the ink from the bottom to the top therefore capturing heat energy below the surface of the printed substrate. Since many inks require different temperatures and drying time the more consistent and concentrated the heat the better and more efficient the drying process.

For example, if an electro-conductive ink requires a drying temperature of 100 degrees C to dry the ink fully on a given substrate. As the air travels across the surface of the ink, the heat dissipates quickly. This can be very inefficient since most of your heating elements need to be constantly brought back up to the required temperature. Since a contact dryer uses a heated platen that dries the ink from the bottom to the top this eliminates 'skin effect' on the ink because the drying begins below the surface of the ink and finishes at the top. Once the heated plate reaches the desired heating temperature it can be up to 70 percent more efficient because the heat is captured and does not require constant energy to the heating elements. The heated platen usually contains three heating elements within the system. Generally, the third heating element at the end of the dryer requires much less energy because the heat remains constant from beginning to end. A hot air dryer consistently requires the same amount of energy throughout the dryer because of the loss of heat when blowing air across the surface.

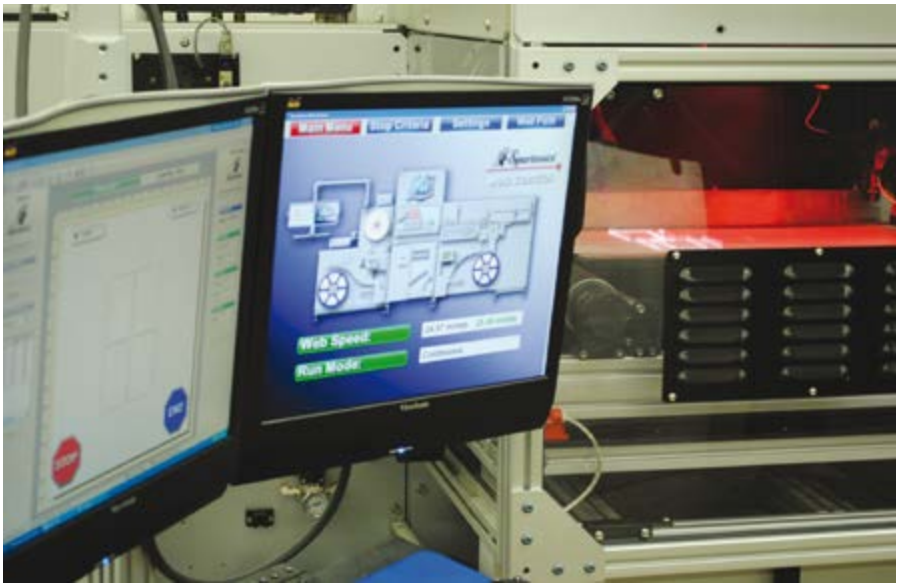
Another benefit of a contact dryer is the time required to dry the ink. Since it can dry inks more efficiently and faster than a traditional air dryer the floor space required is reduced. With square footage within a facility at a premium the ability to shorten the overall footprint of a screen-printing line can save businesses a significant amount of money.

The traditional air dryer will continue to work for many screen-printing applications. It is important to recognise that there are alternative technologies in the field that are offering energy efficient alternatives.


*A vertical Spartanics-Systec contact dryer*

### TRADITIONAL DIE-CUTTING V LASER DIE-CUTTING

When looking at the finishing end of your printing business it is important to take into consideration run lengths, registration requirements and cut quality. Traditional die-cutting equipment, such as flat-bed die-cutting, has been the standard. As the trend for shorter run jobs continues to creep into the printing industry, so the need for a flexible, accurate die-cutting solution is evident. Gantry laser cutting systems have been working on flexible membrane switch applications because of the accuracy (+/- 0.1mm or better) and flexibility. The bigger issue has been the speed. A gantry laser system mechanically moves the material or the laser head into position while it is cutting. A galvanometer (galvo) laser system offers flexibility, speed and relative accuracy by remaining stationary above the roll or sheet of material and allowing micro movements of mirrors to redirect the laser light around the die-cut line.




*Investment in technology can lead to overall benefits*

The debate between either a gantry or galvo laser die cutting system is a sub-plot of the overall die cutting discussion. Cut quality remains a question mark for many first time technology gazers; however, companies are constantly testing different substrates to assure for quality products. Polyesters, polycarbonates, paper and many other materials are candidates for laser cutting while research laboratories have been set up by many equipment manufacturers to evaluate any quality concerns.

In the past, accuracy was a question mark for galvo laser die-cutting systems but with the integration of XY plotter tables into galvo sheet fed laser designs this argument has subsided. For example, the lead on a flexible circuit may be identified as the most critical part of the circuit. If this lead (or plug) does not meet a minimum requirement of +/- 0.1mm or better then the part may be considered defective. Since the gantry system moves to the desired cut point it maintains the necessary accuracy. The galvo system is mounted a fixed distance above the sheet so cutting a part on the edge of a sheet can create accuracy issues. By moving the table (or the head in certain applications) to a predetermined position the accuracy of the galvo laser die cutting system reaches +/- 0.1mm.

Removal of weekly, monthly, yearly expenses of tooling offers the biggest cost savings for any finishing department. Include in the discussion the lost time in waiting for new tools to arrive or the set up/ make ready required for installing a new tool and laser die-cutting begins to make sense. The initial hurdle for this technology can be pricey as is the case in the above section about drying systems; however, following the initial investment the laser die-cutting systems eliminates the need to purchase tooling for new product designs or replacing damaged dies. In order to evaluate the viability of laser die-cutting technology screen-printers must first look at the inventory of tools on their shelves and determine if the pain is such that removing these tooling costs is enough to justify an investigation. Cut quality, return on investment and speed requirements will all take care of themselves upon consultation with a laser die-cutting equipment provider.

In summary, each new technology requires greater initial investment; however, once you look past the price tag, there are many benefits to consider. The most important thing is always to identify pains and have good information to solve any given issue. ■

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# GAIN CONTROL WITH IN-HOUSE PRINT FINISHING

## Jamie Nute looks at the benefits and versatility of the Triad Digital Graphic Package Welder

**As the margin for digitally printed products shrinks, the ability to control cost, quality and time becomes ever more critical. All too often the damage or delays caused by outside services to assist in finish print work spoils not only the profitability of the job but also the relationship with the customer.**

Many print service providers outsource their finishing production requirements to third-party companies because they believe it is costly, time-consuming and that it will require a large working area. However, it is worth considering the current costs of outsourcing your print finishing as well as various cost associated with lost time and labour. What are the transportation costs sending and retrieving the job to be finished? How much time is taken when collecting the finished job, inspecting it, and repackaging it for delivery to the customer? How satisfactory is the quality of the finishing you're paying for? And what is the cost if the outsource finishing service is late or damages the print job?

### EVALUATING THE CHOICES

These and many other questions should be considered when evaluating whether an in-house solution should be reviewed and purchased. In today's increasingly competitive environment, outsourcing issues and problems need to be balanced against the convenience and efficiency of adding welding capabilities to an existing production facility. It only takes one delay, or a job which has been produced in lower than expected quality, to damage a good relationship with the end customer and this can lead to a tremendous loss of future business as well as the print company's reputation. Above all, reprinting a job is costly and time-consuming. Investing wisely in the finishing side of your print business with an economical and versatile solution will prove quickly that it is able to make all the difference.

To counter these problems, the Triad Digital Graphic Package Welder has been designed and constructed to provide a versatile, easy to operate, and cost effective solution for print finishing. It's intended for in-house fabrication of a wide range of vinyl media, such as PVC, PP, PE, and Mesh. The thickness which can be welded normally ranges from 5 to 100 mil, and can be supported or non-supported material. In addition, a non-thermoplastic such as acrylic coated fabric material, can be bonded with the assistance of a thermal bonding tape.

The welding of various thermoplastics is achieved via a combination of wedge temperature, the material speed passing over the wedge, plus the pressure from the pinch rollers. The material is placed between the pinch rollers and the hot wedge is inserted. Contact is made between the top and bottom of the material and a melting of the coating takes place according to the specified speed of the material crossing the hot wedge surface. The pinch rollers then apply pressure to the melted coating to create the lasting bond.

### BENEFITS OF WELDING

In the wide-format printing industry there are several reasons for needing to weld materials, with the most obvious being the requirement to produce displays which require considerable fixing to the jobsite application. Wedge welding provides a bonded strength which is greater than the original material and creates a clean, flat seam which does not distort the image that could detract from the quality of the finished job.

The Triad DGP can be used to produce a variety of welds to suit different installation techniques. This system incorporates a variety of options to create a range of finishes that accommodate the growing variety of fixing methods for large displays and graphics. Using the various material guides, which are included with the machine, this hot wedge welder can provide several different hemmed edges. Each guide is straightforward to configure on the welder which is designed to accommodate the most commonly used options, such as the production of various diameter pole pockets, keder strip, and flat hemmed edges for eyelets.

If you are not a wide-format printer, the Triad DGP can assist in joining printed panels together smoothly and cleanly to form a complete large format project. With the easy-change material guides, basic finishing needs such as flat hemmed edges or small pockets for a weight bar can be completed quickly and easily. And utilizing the guides in various combinations can lead to further possibilities.

Reinforcement webbing can also be welded to the edge of a mesh media to give the material strengthened edges for eyelets. Back-lit projects can be completed with the assistance of a clear thermoplastic tape, and point-of-purchase advertisements can be finished with a pocket or keder edge for insertion through an aluminium channel profile.


*The compact Triad Digital Graphics Package Welder*

*A hem cord and pole pocket produced on the Triad welder*

## USING THE WELDER

The Triad DGP Welder is a compact unit which can be run from a table top or on a floor surface. There is a metal track section which can be used to provide a channel for the machine to run within, and this also provides easy set up of the material by the operator. The track can be secured or left unattached so that, if the table or floor space is needed for other uses, the Triad system can be easily moved and put aside.

Material set-up is simple, and it should always be laid out as flat as possible, either on the floor or on the table, according to the set-up of the fabrication area. Most materials, and particularly those which are thinner, need to be checked and pulled taut to remove any wrinkles. Using sheet metal in or next to the machine on the table means that magnets can be used to position and hold the material in place. Likewise, the media can be held taut using tape or clips.

Requiring only single phase power (230V) and consuming less than 0.5 kw, the Triad DGP does not require a high amount of energy during its operation. This feature alone can provide large cost savings when compared with other finishing equipment. In addition, the wedge welding system produces no noise or hazardous fumes during welding and, therefore, requires no special ventilation. This is key to most print shops where the area for finishing is often located in a confined space.

The Triad Digital Graphics Package Welder is only one part of a complete production facility that Sinclair Equipment Company offers. Vacuum production tables are available to provide an inset track for the Triad DGP to run within, with the printed panels on either side being held with vacuum assistance to keep registration. Filler tables provide extra width to the vacuum tables for laying the image completely flat on a surface. Rotary blade cutters of various widths up to 3.5 m can be placed on a table surface, similar to the filler tables, for slitting individual prints from a finished roll. Finally, grommet machines can be outfitted on a rolling cart with a track section built on the far side of the tables. With this production system configuration, print finishing is complete from cutting off the printed roll, to welding, finishing and, finally, eyelet punching to make ready for installation.

Besides the advantages of versatility, ease of use, and low investment cost, this type of in-house finishing retains total control over what happens to the image after it is printed. This void for many print shops is where profitability is lost. Another bonus is that, by using the Triad Digital Graphics Package Welder, users can develop new methods of producing finished displays which are compatible with, and complement, specific framing and installation techniques and, thus, to provide value added services to their end customers. ■

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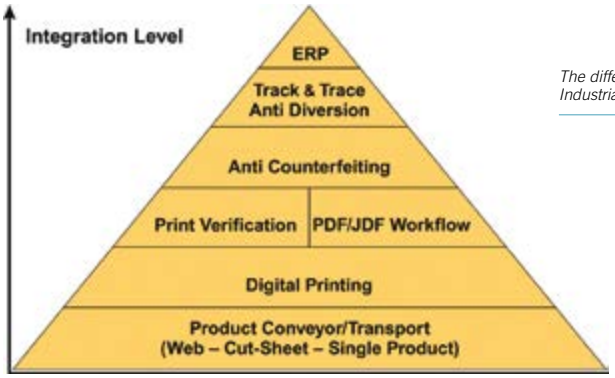
# THE NEXT STEP IN THE EVOLUTION OF INDUSTRIAL DIGITAL PRINTING

## Key success factors for improved profitability, modular implementation, integration, variable data, substrate flexibility and late stage customisation are assessed by Ralf Hipp




*The different integration levels of Industrial Digital Printing*

**As the world of print becomes increasingly digital, it also becomes easier and more critical to build modular production lines that are flexible and can rapidly adjust to changes in both the market-place and customer demand. While there is no comprehensive concept yet that encompasses the full range of industrial digital printing, Atlantic Zeiser has taken it upon itself to begin that definition process and the realisation of a new approach with the introduction of the Industrial Digital Printing 2.0 (IDP 2.0) concept. IDP 2.0 will carry Atlantic Zeiser customers into the future, protecting investments and improving productivity, brand value and profitability.**

A critical aspect of a cost-efficient and profitable modular production line is the ability to address production issues like more variable content and information, late stage customisation, decreasing batch sizes and end-to-end direct product printing. There are multiple different integration levels within production processes that should be considered in such a modular approach, including:

- Product conveyor/transport
- Substrate-flexible digital printing
- Print verification
- PDF/JDF workflow
- Anti-counterfeiting security
- Tracking and tracing, and
- Integration into existing ERP (Enterprise Resource Planning) systems

Each level of the pyramid requires an increasingly complex level of integration to ensure end-to-end efficiency.

Solutions built upon the Industrial Digital Printing 2.0 concept position customers to address rapid market developments in a manner that minimises implementation times and enhances productivity across a multi-stage model. This model encompasses end-to-end secure manufacturing of high-quality printed products through the entire industrial digital printing production and logistics chain.

### PRODUCT CONVEYOR/TRANSPORT

Clearly, the transport system must be able to be structured to handle a wide variety of output types and substrates, ranging from web and cut-sheet substrates to single product transport. This is the foundation and basis for any automated industrial printing operation. The transport system must be flexible enough to manage almost any type of substrate the plant is likely to be using, taking into consideration size, thickness, and composition of the substrate. It must also be able to handle single-products, including three-dimensional pieces. As a module, the transport system or product conveyor must be able to be optimised as new materials are used, or swapped out without the need to acquire an entirely new system to produce new product.

### SUBSTRATE-FLEXIBLE DIGITAL PRINTING

Industrial printing systems often have a built-in print engine that is the heart of the system. Once that engine becomes obsolete or does not meet requirements for new applications or customer demands, an entirely new system often must be acquired. In a modular world as envisioned by Industrial Digital Printing 2.0, print engines can be added and/or swapped out as needs change. Atlantic Zeiser has 18 different print engines in monochrome and process colour for in-line integration into existing production lines of different printing solutions, including both UV-curable and water-based options. These can be modularly assembled to meet almost any digital printing requirement on different substrates. These drop-on-demand ink-jet systems can replace slow laser technology


*Digiline provides one-stop shop integration for complete off the shelf end-to-end system solutions*

to deliver higher throughput, increased productivity, and utilise custom colours for increased brand value.

## SYSTEM SOLUTIONS FAMILY DIGILINE

For example, the integrated system solution Digiline Web has two models with web widths from 30 to 280mm, speeds of up to 180m/min and monochrome or full-colour printing. It is ideal for label, booklet label and flexible package printing of variable and often changing information and data.

Digiline Single Product comes in three versatile models for different product form factors, including three-dimensional, with widths from 10 to 500mm and at speeds of up to 90m/min, also in monochrome and process colour. These models are more suited for package and direct product printing.

Digiline Sheet integrates necessary modules to a comprehensive system solution to cover all individual requirements of mailing, transpromo and security printing on carton sheet or different papers at maximum speed and quality. Four models with sheet widths from 30 to 1,050mm with speeds up to 120m/min will be available. Optionally customers can add Print Verification, PDF/VTx, Anti-Counterfeiting and Track&Trace modules to their system solution.

From a printing process perspective, there

*Digital printing solutions for different applications include packaging, without any restriction of material and colour*

are four key success factors that Industrial Digital Printing 2.0 concept takes into consideration, all four of which Atlantic Zeiser manufactures in-house and all of which must work together, in line, in a modular and integrated fashion to ensure the highest standards in quality and productivity:

- Print engine hardware
- Ink chemistry
- Curing technology
- High-speed RIP technology

*Substrate flexibility is the key*

## PRINT VERIFICATION

Clearly, print verification is an important element of any industrial printing, especially for security printing. Modules like VeriCam can be embedded in the system at critical points to ensure security and consistent quality. This becomes even more important for error recovery when using variable data or sequenced labelling in order to resolve, quickly and efficiently, any issues and to ensure that each and every piece that is

*Continued over*


*Labels and fast changing print data*

intended to be printed actually comes off the line as expected.

## PDF/JDF WORKFLOW

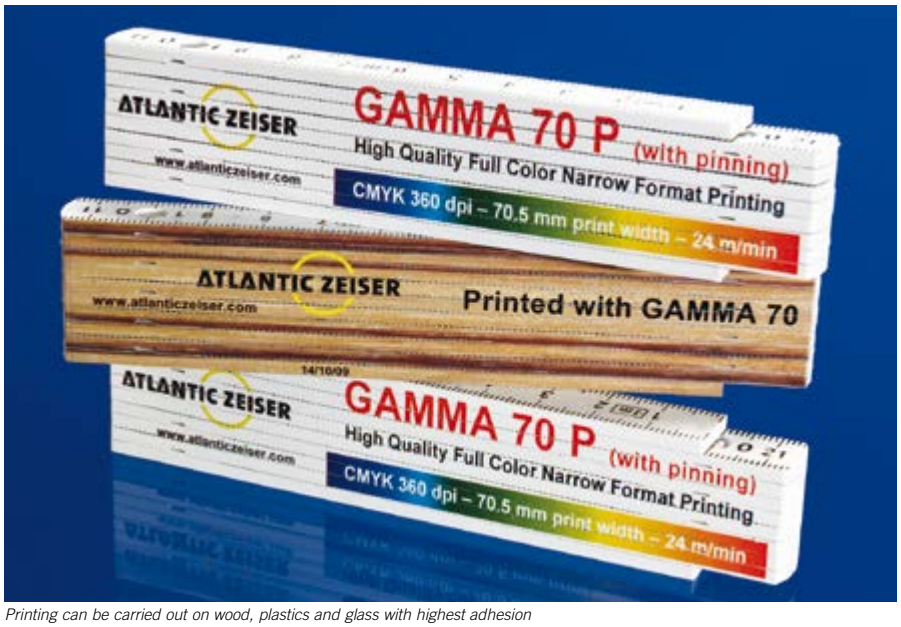
PDF has become the de facto standard for file transfer. Any automated digital system must be able to handle a PDF workflow. In addition, JDF (Job Definition Format), a standard that was initially developed to help automate the production of commercial print, is slowly making its way into the packaging industry. When building a modular digital production line, manufacturers should ensure that systems are PDF- and JDF-capable or that suppliers have a solid plan to get there. All Atlantic Zeiser systems within the Digiline system solutions family support both PDF and JDF, including the emerging PDF/VT standard which is in process of being approved by the International Standards Organization (ISO).

Enhancing variable data capabilities with PDF/VT means minimising the size of data streams, eliminating bottlenecks for the Raster Image Processor (RIP), and shortening the printing process. This enables producers to shift variable print content to later production stages, as this is often more cost effective. At the same time customers can continue using the PDF/JDF format and workflow throughout the manufacturing process.

## STRATEGIC ALLIANCE WITH ADOBE CO-DEVELOPMENT PARTNER SOFHA

Atlantic Zeiser's recent strategic alliance with Berlin-based SOFHA GmbH, a leading software solutions' provider to high-speed digital printing machine OEMs, means that Atlantic Zeiser will be able to offer new solutions and PDF/VT enhancements for industrial digital printing. SOFHA belongs to Adobe's exclusive circle of co-development partners with access to the company's source code, enabling SOFHA to integrate and adapt those for industry specific needs, as well, a critical factor in ensuring effective PDF workflows. The co-operation between the two companies is targeted at developing highly efficient digital printing solutions based on Adobe's PDF portfolio of standards and creating a future PDF/VT enhancement as a new standard for lean variable data processing, as well as leveraging SOFHA's deep integration expertise with software systems such as print-on-demand servers and bitmap libraries.

The future of industrial printing lies in the ability to incorporate variable data printing into the mix at the most cost effective stage of the production process, and Atlantic Zeiser is focused on accomplishing this while supporting the latest variable data printing technologies and solutions within its Industrial Digital Printing 2.0 approach.




*Printing can be carried out on wood, plastics and glass with highest adhesion*

## ANTI-COUNTERFEITING SECURITY

High-level counterfeit prevention is incorporated through different processes embedded into the product DNA via microstructure profiles of the print substrate. Under this concept, Atlantic Zeiser also integrates components for product monitoring and offers a solution for the grey market problem.

## TRACKING AND TRACING

This is the process of determining the current and past locations of a product as it moves through the manufacturing line, feeding information to real-time databases and dashboards to allow operators and managers to closely and accurately manage the progress of a particular project through the manufacturing process. Track and trace technology is also often used to help locate and identify items throughout the supply chain for product recall or other purposes. High quality printing of product production lot number, date code, manufacturing location code, etc, are critical for these purposes as well.

## INTEGRATION INTO EXISTING ERP (ENTERPRISE RESOURCE PLANNING) SYSTEMS

For many manufacturing operations that include industrial printing, the ability to integrate the production line into existing ERP systems is becoming increasingly critical to ensure an appropriate flow of business and production data. Therefore, within the IDP 2.0 concept the state of integration capabilities into existing ERP systems is a crucial point. Atlantic Zeiser develops interfaces to ensure seamless access to relevant data which are used and stored in the databases of the ERP

*Offset-class print speeds and high quality*

system. The latest generation of controller devices and software are able to control the exchange of different data types, such as production information, print information or particular codes.

## THE FUTURE IS NOW

With the Industrial Digital Printing 2.0 concept the next step in the evolution of industrial digital printing is now here through integrated solutions for each level within the digital production process. A comprehensive suite of modules and system solutions for industrial digital printing delivers offset-like quality and productivity on a broad range of product substrates, including coated paper and cardboard, plastic, metal, foils and glass. It incorporates the latest in PDF/JDF automation and variable data capabilities. And it ensures security throughout the manufacturing process with VeriCam and track and trace technologies. ■

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# PERFORATED WINDOW GRAPHICS AND THEIR UNLIMITED OPPORTUNITIES

## Judy Bellah shares tips on ensuring successful results with Clear Focus Imaging's One Way Vision window films

**What began in the early 1990s as a highly specialised niche – pressure-sensitive calendered PVC punched with holes, printed and attached to the windows of transit buses – has evolved into a mainstream, multi-million dollar industry. Popular applications of what's commonly called 'window perf' include consumer and commercial vehicle graphics, building wraps, corporate identity, and commercial and retail store signage. One Way Vision perforated window films offer some clear advantages as well as unique challenges, the most common of which we'll examine.**

### LIGHTER SIDE OF ART

Graphics printed on window perf tend to look washed out when compared to those printed on solid vinyl because as much as 50 percent of the film's surface has been punched away. Several solutions are available to obtain more vibrant graphics. The first is to increase the image contrast by 10 to 20 percent during the design stage to compensate for the reduced image reflectivity caused by the 'missing' film. Another option is to select a product featuring more print surface, such as a 65/35 perf pattern (65 percent print surface, 35 percent holes), and smaller holes. Thirdly, if necessary, run a second pass to lay down more ink.

Bright colours provide the best print results with perforated vinyl films. Dark colours are not recommended for backgrounds or other large areas for several important reasons: 1) Depending on the lighting conditions they can allow the viewer to see through the graphics, which is the opposite effect than that desired; 2) they require more ink coverage, which can magnify any banding or other printing imperfections; and 3) they absorb more light and may increase heat buildup on the glass.

### MATCH POINT

For artwork with text or intricate designs, keep in mind that fine detail and small type are not suitable for films with a 50/50 perforation pattern because half of the film has been perforated. Films with a 65/35 or 70/30 perf pattern are better suited for graphics-intensive designs. When including text, use a point size of 30 or larger for 65/35 or 70/30 films, and 50 or larger for those with a 60/40 or 50/50 perf pattern.

### SEEING THE LIGHT

Lighting plays an integral role in the visual impact of perforated window graphics. For optimum image vibrancy, lighting should always be brighter on the graphics than on the black (see-through) side, including at night. In some cases, such as interior store windows in a shopping mall, auxiliary flood lighting may be needed to illuminate the graphics. Some manufacturers now offer a perforated retro-reflective window film that allows visibility of the graphic during the day and also under retro-reflected light at night.

Retro-reflective window graphics are also visible at night when light strikes them Photo courtesy of Graphic Impressions, Vancouver, BC.

### WIDE ARRAY OF WINDOW FILMS

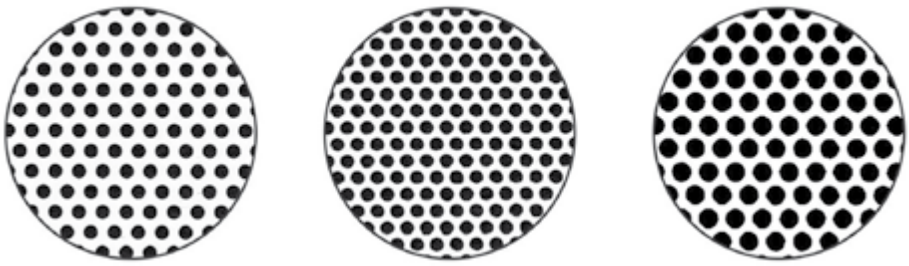
In 1995, the first window perf to enter the market was an eight mil, premium-grade, white/black composite PVC with a clear pressure-sensitive adhesive and a release liner consisting of clear PET film laminated to perforated paper. The product featured a 50/50 perf pattern and 1.5mm holes.

*Continued over*


*Window perfs featuring a 65/35 or 70/30 pattern are best suited for decals and other small-format or graphics-intensive posters*



*Retro-reflective window graphics are also visible at night when light strikes them Photo courtesy of Graphic Impressions, Vancouver, BC*



*Window graphics films are available in a variety of perf patterns and hole sizes*

Today, there is a host of perforated vinyl films offered for every conceivable application, from retro-reflective window film on emergency vehicles to 50/50 films with larger holes for building wraps promoting major sports and entertainment events, clear, pressure-sensitive or non-adhesive window perf for interior-mounted POP posters and non-printable window perf for security, privacy and heat and light control. Printer and ink compatibility runs the gamut as well, from wide-format digital imaging using solvent, eco-solvent, mild solvent, UV-curable and latex inks, to aqueous ink-jet, screen-printing, thermal transfer, airbrushing and, now largely obsolete, electrostatic transfer.

Economy products made with thinner, lower-quality base PVC and having a clear, grey or black adhesive have recently entered the market from Asia. Suitable for point-of-purchase, retail posters and other short-term jobs, especially when price trumps quality, these products should be avoided for long-term, mission-critical or large-scale applications.

## A LOOK AT LINERS

The lay-flat release liner on perforated vinyl film is designed to catch overspray and help facilitate smooth, even transport of the film through the printer. Most release liners perform well with the wide array of printers on the market. An exception is unperforated solid siliconised paper liners, which are not recommended for use with UV-curable printers because the UV-cured inks tend to bridge (clog) the film's holes. For these printers there are several options: a Clear Focus-patented clear PET/perforated paper composite liner, Clear Focus's patent-pending white PET liner available in the USA or its patent-pending DuoLiner, available on certain Clear Focus products in Europe.

## LOWDOWN ON LAMINATION

The use of an optically clear overlaminate provides UV protection, moisture resistance, increased image life and an attractive finish. An overlaminate also prevents the holes in perforated window film from filling with water when it rains or when the graphics are washed.

Many of the same steps apply when laminating window perf as with solid vinyl. Allow the inks sufficient time to dry and outgas before applying an overlaminate; use proper, even tension on the laminator to prevent wrinkles and tunnelling and, after lamination, wait at least 12 hours for the overlaminate's adhesive to bond to the window perf before installing the graphics.

If an overlaminate is called for, confirm that it's compatible with window perf film


*Digitally printable, non-adhesive film can be mounted to the interior or exterior surface of a window*


*Balancing image resolution with one-way visibility, 50/50 window perf is the ideal choice for vehicle window graphics*

and won't obscure visibility. If in doubt, conduct a test prior to use in production. Also ensure that the product is rated to last the desired life of the job. Be sure to match the overlaminate to the installation surface. For curved surfaces, this means a conformable, cast PVC overlaminate. For flat glass, a less-expensive polyester product may do the job. In some cases a liquid laminate may be a better alternative, especially in the case of surfaces with extreme compound curves. To keep moisture and dirt out and to help prevent the window film edges from lifting, especially in the case of vehicle window graphics, seal the edges with a liquid edge sealer or encapsulate them using a half-inch strip of clear, pressure-sensitive overlaminating film.

## STICKING POINT

An all-too-common error made by inexperienced installers is prepping the glass with a solvent-based window cleaner such as Windex. The solvent in the glass cleaner breaks down the adhesive on the window film, causing it to lift. For best results, use mild soap and water to clean the glass and dry it with lint-free towels. Use 85 percent isopropyl alcohol, if desired, to remove any residue but allow it to evaporate completely before installing the film. Always follow the film manufacturer's instructions on the recommended installation temperature range and other important guidelines.

## TURNING GLASS INTO CASH

Adding perforated window graphics to your print portfolio could open the door to entirely new markets and added revenue. The learning curve with this product isn't steep, and the potential rewards are high. One Way Vision window film just might help see your company through to new business opportunities and growth. ■

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# ALL THE SAME?

## It's generally believed that there is no great difference between transfer papers – maybe just a price difference. In an exclusive interview for Specialist Printing Worldwide, Cham Paper Group Digital Imaging's Tobias Sternbeck, completely overturns this belief.

*Tobias Sternbeck answers questions about transfer papers*

**As an introduction, the Cham Paper Group is a leading manufacturer of coated speciality papers. At its three sites in Switzerland and Italy the company, founded in 1657, develops and produces speciality papers used in consumer goods, industrial release and digital imaging. Digital imaging applications are coated poster papers for indoor and outdoor applications and coated sublimation papers for digital transfer print.**

**Specialist Printing Worldwide: What makes Transjet papers stand out from standard inkjet paper?**
Tobias Sternbeck: Sublimation is a very interesting topic. Most people aren't even aware of the possibilities that this technology has to offer. In general, all sublimation papers have a very similar structure. They consist of a base paper and a coating. However, the specific function of the coating changes depending on the paper. Our coatings for Transjet papers are designed to keep the ink on the surface, and this creates a very high transfer rate with brilliant colours. In addition, the user can also save money.

**SPW: Why can Transjet users work particularly cost-effectively?**
TS: It's quite easy – with our papers, they save ink. As I've already said, thanks to the coating, the ink stays on the surface, which means that the user has to apply less of it.

**SPW: We've noticed that digital direct print on textiles is much more common in the media than digital transfer sublimation print. Why is that?**
TS: What you say is correct; there's a lot of advertising for direct print. I believe this is because direct print is not as established as transfer print, which has been used for several decades in conventional print. Digital transfer print is also well over ten years old. There's no doubt that this is a good age for a process within a market that is as fast moving as the digital printing market. However, this doesn't mean that everything that's well established ceases to offer any advantages.

**SPW: So what advantages does digital transfer print offer compared with direct print on textile?**
TS: We believe that digital transfer print offers three key advantages.

1. A digital printer who has chosen digital transfer print has selected the highest quality print technology. So the advertising market for premium products that, amazingly, has remained strong throughout the financial crisis, can also be served with high-quality print. It's still true that higher margins can be attained on this market than on commodity markets.

2. Digital transfer print is a flexible print process. In a highly competitive market, the digital print service provider can process very different and, above all, critical textiles, such as spinnakers or elastic textiles and thus distinguish itself from the competition and continue to offer new solutions. Advertising customers expect this more than anything else so that they can direct the necessary attention to the product being advertised. We, as consumers, cease to notice what was there before.

3. Thanks to the Cham Paper Group's many years of production experience and consistency in the production of transfer papers, the print service provider enjoys very high consistency in chromaticity coordinates from one production order to the next. The advertising customers' marketing specialists are increasingly forced to ensure strict adherence of their companies' corporate identity and will not accept any colour deviations. Many print service providers are probably all too familiar with the situation – a follow-up order suddenly has different chromaticity coordinates and the advertising customer complains. The added value of our product and services is obvious: planning security and cost reliability in a market characterised by increasingly competitive prices.

In summary, this means that digital transfer print is higher quality, offers ways of maintaining a hold on a competitive market and ensures satisfied customers.

**SPW: Which different Transjet papers do you offer?**
TS: The typical variant is the high-quality Transjet Classic paper, which we offer in grammages of 75 and 100gm$^2$. The Transjet Sportsline is fairly new to our range and, as the name suggests, this product is mainly used for sports textiles. The unusual property of this paper is that it adheres to textiles.

**SPW: How does Transjet Sportsline differ from other transfer papers?**
TS: In the printing process, it acts like a completely normal paper but the heat in a calender or hot press activates the adhesive effect. When the motif has been transferred, the paper can simply be peeled off the textile. This has several advantages: flat-bed calendars are generally used for producing sports textiles. The process creates a vacuum and, as soon as the calender is removed, the vacuum is broken. The paper may separate slightly from the textile and then touch again – unfortunately, it never 'lands' on exactly the same place as before. The residual heat in the paper again releases a little ink onto the textile. We call this effect "ghosting". Transjet Sportsline eliminates ghosting completely as the paper forms a bond with the textile. The second positive effect is that, when using our material, the textiles hardly shrink at all during processing because the paper keeps them dimensionally stable. This means that the user can reduce waste in production significantly – another money-saving factor.

**SPW: Is there much demand for transfer papers in wide formats?**
TS: The market is growing quickly because almost all high-profile manufacturers of printers for water-based sublimation inks have now launched wide-format models onto the market. One example is the Mimaki JV5 – 320; our Transjet Pro runs really well on this, even at high speed. However, Mutoh and Roland also offer correspondingly wide machines that are very popular on the market. So we are proud to say that we can meet the trend for sublimation in wide formats. We offer all our sublimation papers up to a width of 308 to 310cm. Intermediate formats are generally not a problem either – and not just with our Transjet Pro product. We are offering this paper with a grammage of 105gm$^2$ and 130gm$^2$.

**SPW: How do your papers cope with the increasing speed of new printers?**
TS: We have already looked into this and launched the next-generation Transjet Express. This paper dries very quickly and was specially designed for this new generation of printers. At present, we are offering this paper with a grammage of 130 gm$^2$ and, in future, we will also be launching lower grammages on the market.

**SPW: Which products do you offer for the sublimation of solvent- and oil-based inks?**
TS: You could use Transjet Sapphire, for example. The coating of this paper is specially designed for solvent- and oil-based inks. It is a strong 140 gm$^2$ paper that absorbs inks very quickly. As the machines in which such inks are used are very powerful, Cham Paper Group offers this paper in a width of 310cm and with 120 running metres per roll.

**SPW: Can the Transjet group of papers actually be used on all standard equipment and with different inks?**
TS: Yes, this isn't a problem at all. At the Cham Paper Group, we take great care to ensure that our papers are suitable for universal application. Today, it would no longer make sense to manufacture a paper for a specific type of printer or a specific ink, as used to be the case with photo or blue-black papers in the past. ■

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# THE GLOBAL MODEL FOR CHEMICAL REGULATION?

## Elaine Campling describes the implications of REACH and how different parts of the world are reacting to reform of chemical management



**The Second Helsinki Global Chemicals Forum took place in May of this year, with significant focus on global chemical regulation and a discussion on whether REACH can become the new global model. A step in the direction of chemical regulatory partnership was taken in the same week, when the European Chemicals Agency (ECHA) and Canada's regulatory counterparts signed a 'Memorandum of Understanding' on safe chemical management to facilitate cooperation between the two regulatory authorities.**

Discussion is also reported to be ongoing between ECHA and the US Environmental Protection Agency (EPA), with the possibility of a partnership between these two regulatory authorities. These initial partnerships may eventually lead to multi-lateral agreement or a global regulation on chemical management, which has in theory been achieved in regard to classification and labelling, with the Globally Harmonised System of Classification and Labelling of Chemicals (GHS). GHS evolved as a mandate from the 1992 United Nations (UN) Conference on Environment and Development, which took place in Rio de Janeiro and became known as the Rio or Earth Summit.

*Different parts of the world are reacting differently to reform of chemical management*

GHS was developed to achieve consistency of hazard identification and communication, which, despite some non global transposition, is a worthy goal. Consistency of approach to chemical risk based management and collaborated priority lists of substances of concern should speed up the process of hazard evaluation and identification of appropriate risk management measures to protect users of chemicals. Sharing information and data should also reduce unnecessary testing of chemicals and collaboration between jurisdictions and national regulatory authorities would also provide for a level playing field for chemical companies to operate.

There has been significant reform of chemical management legislation across the globe, with focus on a more risk based approach. This is largely to deliver on the objective of sound management of chemicals by 2020, the ultimate objective of the Strategic Approach to International Chemicals Management (SAICM) agreed at the 2002 UN World Summit on Sustainable Development.

A non exhaustive brief overview of reform in chemical management across the globe is presented below:

### THE US SAFE CHEMICALS ACT

United States (US) Senator Frank R Lautenberg announced legislation that will overhaul the US Toxic Substances Control Act of 1976 (TSCA). Similar to the REACH Regulation, the Safe Chemicals Act (SCA) of 2010 will require that all uses of a chemical are identified and make industry responsible in proving that safety is not compromised by the use of individual chemicals. It is reported that only 200 of the 80,000 or more chemicals currently on the Environmental Protection Agency's (EPA) Inventory have been subject to testing at the instruction of the EPA, due to limitations in Policy. The new legislation will give more power to the EPA in the regulation of hazardous chemicals and require manufacturers to submit safety data both for new and existing chemicals.

EPA will prioritise chemicals on the basis of likely risk, having evaluated use, volume, toxicity and environmental risk indicators and will be expected to act in a timely manner in the case of chemicals that are considered to pose a high risk.

A public database will be established to record the information provided by manufacturers and the EPA assessment, in another facet of this Act, to enhance public awareness. In March 2010, EPA announced free web access to the consolidated TSCA Inventory available on Data.gov.

### CANADA

Aside from the bilateral agreement between Canada and ECHA, Canada has been reviewing existing chemicals on the Canadian market for prioritisation of control and risk management under Canada's Chemical Management Plan. Some 23,000 chemicals have been screened according to a criteria based on risk to health, safety and/or environment and some 4,000 substances were identified as requiring further investigation via a data gathering exercise. Of these, approximately 200 chemical substances were categorised as high priorities for risk assessment and control. Controls are reported to include restriction and prohibition of use. Industry has and will continue to be involved in the information gathering process and also in developing risk management measures, following evaluation of the dossiers for these chemicals.

### JAPAN

The Japanese Chemical Substances Control Law was amended in May 2009 in light of the globally harmonised system for classification and labelling (GHS) and to achieve better risk based management of industrial chemicals on the Japanese market. Manufacturers and importers must work with the Ministry, providing annual use volume and exposure information under a new compulsory system. A priority list of chemicals for risk assessment will be developed and information derived from downstream users will also be utilised by the Ministry.

### CHINA

The Chinese Ministry of Environmental Protection is set to amend legislation governing the notification of new chemical substances, which could be implemented as early as October 2010. The new regulation will apply to new chemical substances and not the 45,000 substances that are currently listed on the Inventory of Existing Chemical Substances Manufactured or Imported into China (IECSC). The existing chemical registration system will

therefore be expanded and chemicals not properly registered will be prohibited. The proposed new chemical notification scheme is being likened to REACH and there are certainly proposed similarities set out in the draft legislation: Although there are duties for chemicals manufactured/imported below one tonne per annum, the data requirement increases with increase in annual tonnage band i.e. is volume dependent. Although not certain, it is understood that registration may only be conducted by Chinese based organisations, similar to REACH.

## TURKEY

Turkey's new Chemicals Management Regulation is said to be a stop gap to the 2013 expected implementation of REACH. Manufacturers and importers of substances and substances in preparations above one tonne or more per annum must be notified to the Turkish Ministry of Environment and Forestry.

Basic information will be required for supply up to 1,000 tonnes and more detailed information for quantities above this. However, the notifier may be asked to submit additional information for substances in the lower band, depending on the outcome of hazard assessment and prioritisation of substances conducted by the Ministry. A priority list of substances or substance groups requiring specific attention due to their potential effects on human health and the environment will be developed with carcinogenic, mutagenic and reprotoxic substances given the highest priority.

## CLOSING THOUGHTS

Elsewhere Australia, Brazil, Russia and Taiwan, for example, chemical management schemes similar to REACH are being introduced or investigated. However, a cautionary view has been expressed on behalf of developing nations, concerned with the impact of REACH on trade due to the limited resources of developing countries, unable at this time to introduce costly REACH style chemical regulation. ECHA is keen for the REACH Regulation to become the global model and have noted the global involvement of companies working to implement their REACH strategies for supply to European market. Others who believe REACH is overly bureaucratic, authoritarian and costly are concerned by the idea of a global REACH style Regulation.

REACH has been perceived as a trade barrier to suppliers from outside of Europe, but making importers, as well as European manufacturers, responsible for registration, with the option for an Only Representative was the considered way to protect the European chemicals market i.e. not drive it outside of Europe. A global system may eventually help to break down chemical supply trade barriers, but add further cost and complication in the meantime: for example, with importers wanting composition information in the cases where registration/notification must be made by entities from within the country or jurisdiction.

A global shift to a standardised risk based approach and control of the more hazardous of chemicals is obviously a sound goal helping to achieve safer chemical management, the ultimate aim of the 2002 UN Summit. It might be more sensible, however, to draw on the best points of existing global chemical management legislation and develop a truly global system, similar to the collaboration and development of GHS, rather than take on one system with its good points, but also all of its flaws. ■

***Elaine Campling is Chairman of ESMA's Health, Safety and Environmental Protection Committee and Product Safety Manager for Fujifilm Speciality Ink Systems***

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# THREE-QUARTERS OF A CENTURY OF INNOVATION

## Avery Dennison celebrates its 75th year as it began – by solving customers' problems with innovation. Joel Ross looks back

**Avery Dennison Corporation, the product of one man's insight into manufacturers' and retailers' needs, is celebrating its 75th anniversary as a company in 2010 with activities ranging from ringing the closing bell at the New York Stock Exchange to hosting employee celebrations around the world.**

Perhaps the most important way of honouring the company's founding in June 1935 by R Stanton Avery, who developed the world's first self-adhesive label and label-making machinery, is to extend his legacy of solutions intended to help people conduct business, make informed consumer choices, and organise information they need to live more productively and enjoyably.

"I'm excited about the future as we honour our past," said Dean Scarborough, the company's chairman, president and CEO. "Avery Dennison has always stood for innovation, and that legacy continues to propel the company forward as we invest in new markets, products and technology to better serve our customers throughout the world."

'Stan' Avery developed the world's first self-adhesive label and label-making machinery in a loft above a flower shop in downtown Los Angeles after observing that store owners had no convenient way of marking items with current prices. In 1935 he began selling Kum-Kleen removable price stickers – "After applying, attach entire surface firmly by rubbing with tip of finger," said the instructions – and in his first six months totalled $1,391.

*Avery 5500QM, 5301 Blockout, AV Flex 2 MIP 2002, dusted glass film EZRS and perforated window films were used for this retail store*

From Avery's pressure-sensitive materials and production technologies, for which Stan received 18 patents over the course of his career, the company named after him has evolved into a $6 billion global leader in labelling and packaging solutions, retail branding and information solutions, plus organisation and identification solutions for work and home. The company currently employs more than 30,000 people in more than 60 countries and its shares are listed on the New York Stock Exchange.

"Innovation that improves customers' businesses and lives has been at the heart of Avery Dennison since 1935," Scarborough said. "Avery Dennison is everywhere and impacts people every day – we're on the products in the stores where they shop, the clothes they wear, the car they drive, the signs on the highway they pass, in the offices where they work and the schools they attend."

Among the company's innovations are:

- The first die-cutting method, in-line machinery and rotary die for self-adhesive labels
- The first synthetic-based pressure-sensitive adhesive and quick-release coating for self-adhesive products
- The first non-removable pressure-sensitive adhesive
- The first method to successfully anchor ink to new film and foil surfaces
- Ultra-violet and electron beam curing and new heat transfer systems for drying adhesive and silicon-cured materials
- Ultra-high adhesion products using new radiation-cured technology

While the company has built substantial business groups providing retail information services and office and consumer products, its largest business is still the development and production of pressure-sensitive materials and other specialty materials.

Its Graphics and Reflective Products division is a global innovator and manufacturer of pressure-sensitive imaging media such as adhesive-coated materials designed to be digitally imaged, screen-printed or computer cut. Available in digitally printable, opaque, translucent, metallic, reflective, special-effect and eco-friendly films, these materials are used in a broad spectrum of applications, including vehicle graphics, roadway and work-zone signage, general wayfinding, retail and promotional graphics, paint replacement and surface protection.

*R Stanton Avery founded Avery Dennison in June 1935*

Today, the Graphics and Reflective Products division is focusing not simply on materials. In keeping with Avery Dennison's new vision of "making every brand more inspiring and the world more intelligent", it is working collaboratively with brand owners, converters, applicators and designers to create graphics for the fleet, architecture, traffic, safety and transportation industries. Its new Supercast digital cast films, with superior conformability and colour reproduction, are the outcome of this new process of engaging end users and developing products that will solve their day to day challenges.

Each Avery Dennison business is discovering new customer needs and new opportunities through this process of engaging end customers. According to Scarborough, the process is a new statement of the company's fundamental premise. "Our new emphasis on understanding end customers' problems – and solving them with innovation – is Stan Avery, pure and simple. His ability to see a solution where others just saw the problem helped us bring Avery Dennison seven and a half decades of success, and it will be the foundation of the company's next 75 years." ■

***Joel Ross is Senior Marketing Communications Manager at Avery Dennison Corporation***

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# TWO THEMES = ONE EVENT

## Advanced Functional Printing 2011 + Membrane Switch Symposium 2011

*Advanced Functional Printing and Membrane Switch Symposium both follow on from previous highly successful events staged by ESMA and sponsored by Specialist Printing Worldwide.*

**Taking place on 10 and 11 March 2011 in Düsseldorf, Germany, Advanced Functional Printing 2011 and Membrane Switch Symposium 2011 are a joint two-day conference. An international audience will be able to take advantage of attending both sets of papers, which will be presented in dual English and German.**

Advanced Functional Printing will offer printers a series of presentations from industry experts covering the best practices, as well as offering an invaluable insight into the latest technologies available. Applications to be covered will include automotive, film insert moulding, nameplate, fascia, printed electronics, circuit, label and solar cell technologies.

At the same time, Membrane Switch Symposium 2011 will provide printers and manufacturers in this important industry niche with the latest advanced technologies for membrane switch and industrial graphics manufacture.

Expert speakers will recognise the functional, aesthetic and integration advantages of membrane switches by offering a series of educational presentations covering market trends, current technologies and future opportunities. Printers, managers, owners, designers, OEMs and suppliers from throughout the world will also be given advice on best practice in operating and production for lean manufacturing.

Membrane Switch Symposium 2011 follows on from the first event in 2009, which was deemed an outstanding success by an international audience of more than 130 attendees.

The conference programmes will be supported by regular intervals dedicated to an accompanying tabletop exhibition of leading manufacturers of machinery and consumables.

For a limited time, attendees can take advantage of a reduced early bird delegate fee of only €595 total, including access to all presentations at both events, exhibition displays, refreshments, lunch and dinner. Discounts are available for multiple delegate bookings – please call +32 16 894 353 for more details.

The concurrent events take place at the easily accessible Radisson Blu Scandinavia Hotel in Düsseldorf.

Advanced Functional Printing and Membrane Switch Symposium will be staged by ESMA, an association of European manufacturers of machinery and consumables for the specialist printing industry, and will be sponsored by Specialist Printing Worldwide magazine. Both partners have proven track records of staging highly successful international conferences and exhibitions, including European Membrane Switch Symposium, CTS & Digital Work Flow and GlassPrint. ■


*Peter Buttiens of ESMA with Kundisch's Hans Hartmann, a keynote speaker at the 2008 membrane event.*

*Leading machine and consumables' manufacturers provide an accompanying tabletop exhibition*

*Networking opportunities are available during breaks in the presentations*

*Educational presentations cover market trends, current technologies and future opportunities*

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# 10–11 MARCH 2011, DÜSSELDORF, GERMANY
## Radisson Blu Scandinavia Hotel

## Stay ahead with the best practices and latest technology for advanced functional printing


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*Organised by ESMA in cooperation with Chameleon Business Media*

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*Official journal*

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***See overleaf for details***

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***See overleaf for details***

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# GLASSPRINT 2011 WILL REFLECT CONTINUED GROWTH

## GlassPrint 2011, Europe's leading event for the decoration of glass, will take place on 23 and 24 November 2011 in Düsseldorf, Germany.

*Delegates in session at GlassPrint 2009*

**Decoration is a key process in the manufacture of architectural, automotive and hollow glass, and adds considerably more value to the end product. GlassPrint 2011 is a two-day conference that will present anyone involved with this important and expanding sector with the latest trends and developments for the decoration of all types of glass.**

### NEW VENUE

GlassPrint 2011 will expand upon the highly successful 2005, 2007 and 2009 events and will move to the spacious and easily accessible Radisson Blu Scandinavia Hotel in Düsseldorf. Industry experts will offer delegates the latest information on advanced technologies for digital and screen processes, including:

- Keynote addresses
- New directions in heavy metal free inks
- Innovation in digital printing
- Advanced machinery technology
- Efficient pre-press technology
- Group discussions

The event will once again be accompanied by an exhibition of specialist suppliers of equipment, consumables, technology and services, who will display the latest developments in inks, pre-press technology, printing equipment and supplies.

GlassPrint 2011 follows on from the 2009 event, which was deemed an outstanding success by the international audience of more than 130 glass makers, glass decorators and leading suppliers. Attendees travelled from 37 different countries, not only from throughout mainland Europe and United Kingdom, but also from long distance destinations such as Brazil, Chile, China, India, Korea, Pakistan, Philippines, Sri Lanka and USA.

### FEEDBACK FROM PREVIOUS GLASSPRINT EVENTS

A selection of comments from some of the major glass manufacturers who attended previous GlassPrint events includes:

- *"The conference was very useful to my business. I believe that this event occupies an important place in the world in order to follow innovations and developments."* Ata Hakan Yavaslar, Anadolu Cam Sanayii (Turkey)
- *"A well planned and organised conference; I was able to meet various key people and suppliers in areas that can assist my company in moving forward in the future."* Phil Hall, Ardagh Glass (UK)
- *"A very interesting and well organised event."* Liouris Dimosthenis, Guardian (Luxembourg)
- *"Once again, a very interesting meeting. Building relationships during these two days is one of the major reasons to participate."* Olivier Dangmann, O-I (France)
- *"Very interesting conference!"* Jean-Philippe Savary, Saint-Gobain (France)
- *"All the suppliers and customers of the glass printing area were at Glassprint, which allows us to have a global overview of the latest developments."* Virginie Chevaldonnet, Saverglass (France)
- *"Subjects covered were of much interest for me and we're going to update our processes in Schott Colombia."* Hector Gordillo Castiblanco, Schott Envases Farmacéuticos (Colombia)

### SPECIAL OFFER

If you are a glass decorator or a manufacturer of any type of glass, attending GlassPrint 2011 will help you add considerably more value to your end product. For a limited time, you can take advantage of a reduced 'early bird' delegate fee of only €395, including access to all presentations, exhibition displays, refreshments, lunch and dinner. Early bird delegates registering online at www.glassprint.org also receive the full Glass Print 2009 presentations free of charge. Discounts are available for multiple delegate bookings – please call +44 1342 315032 for more details.

GLASSPrint2011 CONFERENCE

### ORGANISERS AND SPONSORS

In recognition of its importance in the global glass event calendar, GlassPrint is sponsored by the DGG, glassglobal.com, L'Institut du Verre, SGCDpro and the SGIA.

The event is jointly organised by:

ESMA Driving Print Excellence

**ESMA** - an association of European manufacturers of machinery and consumables for the specialist printing industry, including screen, digital and pad printing processes. *www.esma.com*

Chameleon Business Media Ltd

**Chameleon Business Media** - publisher of Specialist Printing Worldwide and Glass Worldwide, the bi-monthly sister journal for the international glass manufacturing industry. *www.cbm-ltd.com* ■

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web: www.glassprint.org

# A BUSINESS PLATFORM FOR VISUAL COMMUNI-CATION

**Viscom Italia will be an exhibition featuring a packed programme of events and ideas. The aim is for three days of face-to-face exchanges, during which professionals visiting the show can find new suppliers and will have the chance to see what's on offer internationally, view new products and also discover new potential applications.**

The organisation is shifting up into top gear for the 22nd occasion of Viscom Italia, set to take place from 21 to 23 October in the Fiera Milano exhibition centre in Rho.

The market response to the new fair concept proposed by Viscom has been superb. Wide-format digital printing, sign-making, screen-printing, pad printing, embroidered advertising, promotional goods and clothing, engraving, sports awards, point-of-sale, event support services and digital signage are all encompassed.

Workshops, programmes, conventions, testimonials, training courses and competitions are all part of Viscom's intention to offer a live experience to foster contacts, the exchange of ideas, the sharing of experiences and the development of business.

Many new events will be on offer, such as the screen-printing technique school, designed to bring suppliers together with current and future screen-printing clients. There will also be training sessions that will allow participants to sharpen up their skills, thus improving product quality and cutting production costs.

All eyes will be on eco-sustainability, with the Green Trail, a new event that will take visitors on an informative journey through green communication, directly pointing out the stands of those exhibitors that offer relevant products and provide the chance to take a closer, face-to-face look at the green alternatives present on the market.

As is now customary, the Viscom Forum will take centre stage, with technical and marketing sessions, as well as Matching, the new formula that got off to a highly successful start during last year's edition. The Matching seminars will give participants the chance to listen to testimonials of winning projects and then set up face-to-face appointments with those who have been able to make those projects a success.

Also back this year are the ViscomLabs, the live demonstrations that will take place continuously throughout the three-day event, allowing visitors to watch processes in progress, exchange ideas, share experiences and learn new techniques.

Digital communication will be featured which has finally brought into the spotlight the full potential of a market that in other countries is already very much a reality and that in Italy was in need of a specific fair to generate the right sort of contacts. On show are software, hardware, platforms, results analysis and customised content management tools, interactive displays, touchscreens, kiosks, projectors, 3D screens, and multi-sensory systems. ■

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# VISCOM WANTS TO CONTINUE ITS SUCCESS STORY IN FRANKFURT

**"Full of innovations", "remarkable visitor record" and "a very well organised, extensive supporting programme" are just some of the reactions of the experts to Viscom Düsseldorf 2009. In spite of the gloomy economic forecasts, organiser Reed Exhibitions Deutschland continued on seamlessly from the success of Viscom 2008; with almost 11,000 trade visitors, the visitor record achieved in Frankfurt in 2008 was once again exceeded in the Rhine metropolis. This means there was a solid 22 percent increase in visitor numbers compared to Viscom Düsseldorf 2007 (8,900).**

With Viscom being held in Frankfurt from 4 to 6 November, 300 exhibitors from more than 30 countries are expected at the International Trade Fair for Visual Communication. Once again, Viscom offers not just a large variety of exhibitors but, with its extensive supporting programme, also an enormous range of information and services for the entire industry. This includes, in addition to the fair itself, high-calibre seminars and workshops as well as the presentation of the Viscom awards.

"The success of the Viscom Innovation Award, which we renamed Best of 2010 Award, and of the Viscom Digital Signage Best Practice Award in the last three years prompted us again to honour outstanding new products and digital signage applications combining particular planning efficiency, creative implementation and success in 2010," says Viscom director Petra Lassahn. In addition, the Viscom Best Practice Award Light Advertising will be offered for the second time in 2010. This award is to honour light advertising applications demonstrating particular planning efficiency and creative implementation.

The long-established display Superstar, an award for the display and point-of-sale segment, will have its Viscom premiere. In 2010 it will be offered for the 17th time and, for the first time, with gold awards for exhibits from the short-term, long-term, international, digital signage and consumer packaging segments. Another event is the presentation of the Platin Superstar to the winners of the gold awards in the competitions in Germany, Poland and Italy. "For our exhibitors and visitors the concentration of exhibitors from the display and point-of-sale segment in a section of their own is a asset and ideally complements our established core segments of advertising technology, lighting technology, large format, digital and individual printing as well as finishing technology and digital signage," states Lassahn.

Viscom also offers a comprehensive overview on the themes of ink-jet printing and digital printing. For the second time an ink-jet workshop will be held as part of the second day of the fair. ■

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# INDIA'S FOCUS ON SCREEN-PRINTING

*The next Screen Print India exhibition will be called ASGA India 2010*

**The Asian Screen Printing & Graphic Imaging Association (ASGA) has acknowledged the importance of India as a key player in the Asian and global scheme of the world of screen-printing by deciding to have its next bi-annual deliberations in India, to coincide with India's largest show focused on the screen-printing industry – Screen Print India 2010.**

In addition, ASGA has also announced its support for the Screen Print India exhibition in a big way by announcing that this event will be labelled ASGA India 2010 and that high level trade delegations from all the ten Asia-pacific member nations would visit and participate in the show. The trade delegations would actively seek to interact closely with the Indian screen-printing community and explore the prospects of doing business with Indian entities.

This adds to the support SPI 2010 already has from the SGIA of USA and marks the exhibition as one of the leading shows on screen-printing in Asia. The perceived importance of India as a market in the global scheme of things can be further gauged by the confirmed participation from international screen-printing heavyweights such as Michael Robertson, CEO of SGIA, and Pei Guifan, Chair of the Asia Screen Printing & Graphic Imaging Association (ASGA) and Chair of the China Asia Screen Printing & Graphic Imaging Association (CSGIA).

Mr Anil Brahmabhatt, the President of the Screen Printing & Graphics Association of India (SGAI), described this as: "an exciting opportunity for the Indian industry to showcase their talent to the best in the world". Mr Brahmabhatt also said: "Indian screen-printing has worked hard for this recognition and will make the fullest use of the opportunity to explore business globally and expand their already significant footprint."

The chief organiser of Screen Print India 2010, Mr Devang N Sheth, revealed that these international luminaries are excited by the prospect of coming to India to explore business opportunities and to see for themselves the possibilities of collaborating with Indian screen-printing. Mr Sheth also expressed the confidence that other international visitors from Asia and Europe will confirm their participation in due course.

There is a strong sense of anticipation and excitement amongst the screen-printing community for the exhibition which will take place from 8 to10 December 2010 at Hall No 5 of the Bombay Exhibition Centre at Goregaon, Mumbai. ■

**Further information:**
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# RECORD NUMBER OF FESPA VISITORS NOW VISIT TO MAKE DECISIONS ON DIGITAL


*From the moment the doors opened on the first day, FESPA was packed with visitors*

**More than 21,000 individual visitors from 130 countries flocked to FESPA 2010 in Munich, Germany, from 21 to 26 June, looking for innovative solutions and applications to help their wide-format businesses ride the wave to business success. More than half of all visitors extended their stay beyond one day, taking total attendance to 32504 visits.**

A record 68 percent of visitors to FESPA 2010 highlighted digital technology as a priority interest area, compared with less than 52 percent three years ago at FESPA 2007 in Berlin. This equated to a digitally-orientated visitor audience at this year's event of almost 15,000 printers, more than 50 percent greater than the visitor audience at FESPA's last European Digital event in Amsterdam in Spring 2009 which yielded 9,682 visitors.

67 percent of FESPA 2010 visitors make or influence major purchasing decisions, underlining the event's global reputation as the 'must-attend' international wide format imaging event for business owners and senior managers.

"There was a very strong sense of energy and purpose among visitors to FESPA 2010," comments FESPA sales and marketing director Marcus Timson. "From the first hour of the first day, the atrium entrance was bursting with visitors eager to get into the halls quickly and do business.

"Talking to exhibitors and visitors throughout the show, it's clear that FESPA 2010 has been an event where major decision-makers came with specific business objectives, whether to review particular technologies, meet with chosen vendors, or participate in conference sessions that would deliver measurable value to their business. Printers in this post-recession era are results-driven, singling out solutions that will quickly make them more competitive, help them access new business opportunities, or simply improve their bottom line."

Exhibitors across all five halls at the show endorsed this impression of FESPA as a show where serious business was being done, day in day out. All major vendors hailed the show an out-and-out success in terms of sales generation and relationship-building, seeing it as a clear indication of the sector's return to strength after the challenges of the global recession.

Printers from Germany, Italy, Austria and Switzerland were consistently among the top five visitor groups, comprising 12,352 visitors in total, an increase on their collective attendance at FESPA 2007 in Berlin. Elsewhere in Europe, the UK, France, Spain, Poland and Czech Republic also delivered significant visitor groups. 40 percent of total attendance came from Germany, a further 50% from the rest of Europe, 7.5 percent from Asia, and the balance from the Americas and Africa. ■


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www.aslan-schwarz.com

www.atlanticzeisler.com


www.beltron.de


www.c-m-y-k.com

**This selection of exhibitors ordered their stand photos in this gallery. For a full list of exhibitors, visit www.fespa2010.com**

www.champaper-digital.com

www.esma.com

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www.kiian.com

www.dynamesh.com


www.fotec.ch

www.kiwo.de

www.efi.com

www.gspinc.com

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www.intercoat.de


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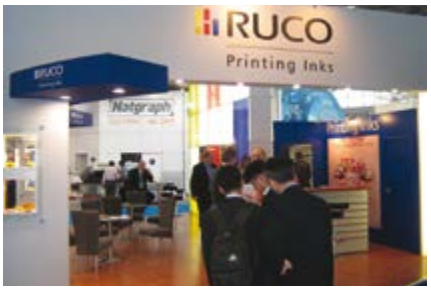
www.marabu-inks.com



www.ruco-inks.com

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www.polytype.com

www.sign-tronic.ch

www.tesoma.de

www.remco-chemie.de

www.sps-technoscreen.com

www.tripette.fr


www.rk-siebdruck.de


www.sroque.pt

www.ulano.com

**This selection of exhibitors ordered their stand photos in this gallery. For a full list of exhibitors, visit www.fespa2010.com**


# IT'S VIVA SGIA IN LAS VEGAS

**Returning this year to Las Vegas, and running from 12 to 15 October, the annual SGIA Expo is promising several firsts as well as established technologies from its exhibitors. In addition there will be no-spin expert advice zones which provide wide-ranging opportunities for attendees to add value-added opportunities to their existing signs and graphics businesses.**

Established as an annual event, SGIA includes every element of screen-printing and digital production, incorporating speciality areas such as pad printing, embroidery, garment decoration, membrane switch production and fine art. Breaking this down further, the show encompasses full information about signs, displays, point-of-sale, fleet and vehicle graphics, nameplates, sportswear, and all areas of textiles. Specialist applications include industrial applications such as glass and ceramics' printing, containers and bottles, circuitry and, with the current attention of greener solutions, environmental alternatives.

Expert advice zones at the show incorporate a special area for digitally produced apparel, plus the PDAA graphics' application area which will provide in-person demonstrations of vinyl installations on a variety of objects and surfaces. The new industrial zone will show state-of-the-art processes and ultra-precise measuring equipment, plus working with expensive and difficult processes which are used for the production of a high-tech products including medical sensors, automotive parts, electronic membrane switches and printed circuit boards.

Also being introduced is the DSA Digital Signage Zone which enables visitors to investigate the processes involved in dynamic signage workflow. This includes the hard-ware, software and network management requirements that are needed to enable this as a profitable marketing communications' system. Similarly, the zone for screen-printed apparel provides the opportunity to learn from industry experts who will demonstrate how to set up an automatic and manual press, discuss artwork considerations, job tracking and production, as well as demonstrating the latest in garment decorating special effect techniques.

Educational opportunities include how to gain maximum profitability in speciality imaging, with a further 20 options highlighting new markets and technologies, plus critical sales and production strategies. These sessions are organised into several tracks according to topic and objective to match each of the sectors within the industry. These run across 13 and 14 October, thus still allowing visitors plenty of time to visit the main exhibition.

There are many supporters of this magazine and/or members of its sponsors, NASMA and ESMA, who will exhibit at SGIA 2010. These include 3M, 3P InkJet Textiles, Agfa, AWT, All American Mfg & Supply, American Biltrite, American Ultraviolet, Anderson Group America, Atlantic Zeisler, Avery Dennison, BBC Industries, BelQuette, Brother, Camie Campbell, Cham Paper Group, Chemical Consultants, Clear Focus Imaging, Coldenhove Papier, Colex Imaging, Cooley Commercial Graphics, Cyrious Software, Durst, Dynamesh, EFI, EIT Instruments Markets, Epson, Ergosoft, ESKO Artwork, F&M


Expressions, Fimor, Fujifilm, Franmar Chemical, Gerber, Grapo Technologies, Graphic Screen Fashion, Grünig, Hartman Plastics, Herculite Products, HIX, Hopkins Riley Screen Printing Machinery, IKONICS, Industrial Fabrics, Interchange Equipment, International Coatings Co, INX Digital, ITW Trans Tech, J-Tech USA, James Cropper Paper & Board, KIP, KIWO (Kissel + Wolf), MACtac, Marabu, Mimaki, Murakami, Mutoh, Nazdar SourceOne, Next Wave Media Solutions, Norcote, Océ, OKI, Oracal, Palram Americas, Polytype, Proell, QCM, R Tape, Roland, Saati, Sakurai, Sawgrass, Screen USA, Sefar, SignTronic, Sihl, Sinclair Equipment, Spartanics, Spectra Jet, Sprayway, Teckwin International, Triangle Ink Co, Trotec Laser, Ulano, Ultraflex Systems, United Industries, Value Vinyls, Western Quartz Products and Zünd. For a full list of exhibitors, visit the website.

More information is available about the latest speciality imaging technologies and applications coming to the 2010 SGIA Expo; these can be found on the regularly revised SGIA website. The New Products section on the homepage offers an exclusive preview of what visitors can expect to see on the expansive show floor from today's industry-leading exhibiting companies.

This frequently updated section features new products from exhibitors, and these will be showcased at the Las Vegas Convention Center. Readers can start planning their event experience to include all of the manufacturers and suppliers they'll want to see by frequently visiting the New Products section, as well as SGIA's Virtual Trade Show, at www.SGIA.org, keyword: VTS.

"The SGIA Expo is the leading exposition for the speciality imaging industry," says Michael Robertson, SGIA's President and CEO. "These online resources provide attendees with the most up-to-date information about the innovative technologies making their debut at the expo. The New Products section and the Virtual Trade Show are great planning tools as they prepare for this exciting event."

The Free Expo Preview Webinar is being held on 6 October. This complimentary session, led by SGIA's Dan Marx, Ray Greenwood and Johnny Shell, will cover emerging industry trends, new product releases and networking events for the garment decoration, graphics and sign, and industrial communities.

The platinum sponsors for this year's SGIA include Agfa, Durst, EFI and HP, with gold sponsors INX Digital International and Roland DGA Corporation. ■

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Specialty Printing & Imaging Technology
**SGIA EXPO**
Las Vegas, NV • October 13-15, 2010
Educational Sessions: October 12-14, 2010



*Continued over*

# A SHIFT IN THE POWER BASE

## Michael Robertson, President and CEO of the SGIA, comments on the changing dynamic within the speciality imaging community

*Michael Robertson is President / CEO of the SGIA*

**Consolidation is a double-edged sword, and it's changing the dynamics in the speciality imaging community. As the community adjusts, there will be winners and there will be those who struggle to compete. Some speciality imagers are benefiting from consolidation by taking steps to gain market share; others, trying to hold on to the status quo, are falling behind as their ability to compete diminishes.**

The global economic challenges have intensified consolidation – in a tight economy, there is simply less work to go around. But there are other important factors contributing to consolidation, as well. The rapid development of digital imaging technology is contributing to the changes in the community. Highly advanced imaging solutions are helping the larger speciality imagers extend their competitive reach. The larger speciality imagers are much better at producing small jobs today. In the past, mid-size graphic imagers could count on certain types of projects being too small for the big companies. It simplified the competitive picture. In today's marketplace, that delineation has faded away.

As a result of consolidation, the larger speciality imagers are getting bigger, while the mid-size and small companies are having a harder time competing. The bigger companies have the resources to invest in the most efficient technologies, employ more expertise and provide a wider range of support to their customers. To their credit, and to the benefit of the community, the successful small and mid-size speciality imagers are finding new ways to compete. They are exploring new products, developing niche markets and providing additional services, such as logistics' management and creative support that are highly valued by the customer.

One could argue that the main reason for the shift in the power base is that the competitive point for speciality imagers is no longer the ability to make a print. Digital imaging has standardised the ability to make a quality print. Today, speciality imagers compete on the value added services and support they provide customers before and after the print. Not all in the community are prepared to modify their business models to accommodate this change. Tighter margins on print production will make it increasingly difficult for companies with too limited a scope to remain profitable. This radical change to the overall value proposition also will contribute to consolidation, since not all in the community will adjust.

The leaders in the speciality imaging community will maximise the latest imaging and finishing technologies. Production capability and efficiencies will be carefully matched to customer needs. These companies will continue to find ways to increase their value to their customers. And they will invest in developing new markets in order to benefit from the first-to-market opportunities and added profitability. They will be highly effective at managing their businesses, using a growing complement of business development resources and communication tools.

SGIA represents the leaders in the speciality graphics community. From our vantage point we see a definite change rippling through the membership as the power base shifts to those companies that are best at maximising technology and seizing emerging opportunities. At SGIA, our role is to provide the resources and community interaction to help members stay informed and better prepared to make key decisions.

The future holds great opportunity for those companies ready to embrace the changing marketplace. ■

SGIA

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# SHOW TIME IN MUNICH!

## Peter Buttiens looks back at FESPA and forward to future events

ESMA
Driving Print Excellence

**Post FESPA we have had time to review what has happened in the market. Although we saw a shrinking of screen based technology, the exhibitors were satisfied with the results of the show. It was good to see that the customer is still willing to travel to discuss business!**

FESPA was also rewarding for ESMA as three new members joined the association:

- Kala (Finishing systems/wide format lamination) from France
- Hollanders Printing Systems (digital textile printers) from The Netherlands
- Chimigraf (ink manufacturer) from Spain.

ESMA launched its first joint pavilion with five members. It was well received and showed the new initiatives taken by the association and its members.

Manuel Zuckerman from Fimor commented: "We were very pleased with the ESMA pavilion which enabled Fimor to have a decent visibility at a moderate overall cost. We were able to keep our visual identity while ESMA's organisation largely contributed to going through the administrative and set-up formalities smoothly. We would certainly consider doing a similar operation again – hopefully with enough advance notice to obtain a better location in the hall."

The next ESMA pavilion will be at Glasstec 2010 in Düsseldorf from 28 September through 1 October. Seven members will join on a 210 square m island stand. Other initiatives for pavilions on other shows will be taken in the near future.

Many companies were pleased to display their new sign plate showing that they were an ESMA member. By placing them on their stand, they were noticed by other manufacturers who are not ESMA members.

ESMA is proud to announce the next two events in 2011 being held in Düsseldorf. The first has a double theme as the Membrane Switch Symposium 2011 and Advanced Functional Printing Conference 2011, which will take place on 10 and 11 March 2011. The double themed event is looking closer into the latest technology in industrial based applications using screen or some digital printing – see page 62.

The second event is our well established GlassPrint event, this time in Düsseldorf on 24 and 25 November 2011.

ESMA is also preparing to launch another event, this time for sportswear and T-shirt printing. More information on this will be available on the ESMA website and in this magazine.

The new ESMA website at www.esma.com has also been launched and is attracting more visitors than ever before. We've noticed that, judging from the many requests for the newsletter, it is getting extremely popular among non-ESMA members.

Last but not least, in early June ESMA started to coordinate a Seventh Framework (FP7) project, a €2.7 million euro programme which is EC funded, under the name of CLIP (Conductive Low-Cost Ink Project). This is a research programme for SME associations and aims to develop a set of low cost inks to enable small and medium sized EU based businesses to address the growing potential of printed electronics. Full details can be found at http://www.clip-fp7.eu. This development project for SMEs will cover the next 36 months. ■

***Peter Buttiens is CEO of ESMA***

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# STEVE KAHANE PROVIDES AN UPDATE ON NASMA'S ACTIVITIES AND HIGHLIGHTS THE OUTCOMES OF ITS SPRING MEETING

*Stephen W. Kahane, NASMA Chairman*

**NASMA held its spring meeting on 12 and 13 April in Cincinnati. It was my inaugural meeting as Chair and our first meeting as an executive forum. Our new more interactive meeting format was very effective in engaging the group in open and frank discussions of important (and non-competitive) issues of the day. Here are some of the highlights from this meeting.**

No surprise, the lingering effects of the recession were top on everyone's minds. The group was cautiously optimistic about the future. Most member companies are seeing improved business conditions and strengthening sales. They expect to begin spending more on marketing in the coming months, but hiring and capital expenditures will be measured. While the bottom may be behind us, members feel the recovery in North America will be gradual and unsteady. Controlling costs and increasing productivity remain a priority.

Steve Ducilli of ST Media gave the group an excellent overview of where he sees the print industry heading in the next several years. Many of the issues which were raised touched on reaching and educating customers more effectively in a world of new sales channels, taking best advantage of the rapid growth in social media, and how those new channels will affect traditional print media.

Bob Kissel of KDM POP Solutions, provided a customer's perspective on the industry over the past several years and how KDM is positioning for the future. Important take-aways for NASMA members were 'Speed to Market' and the need to differentiate on service and customer relationships, all the while providing competitive prices and assuring consistent quality.

Marci Kinter, SGIA's Vice President for Regulatory Affairs spoke with us about the move towards certifying 'sustainability' and its potential impact on the printing industry. Sustainability is being thrown about with little common agreement or understanding of what it means or how it should be measured. There are various initiatives and organisations that are becoming increasingly active and jockeying for position and primacy on this issue. Marci sought input from NASMA on how SGIA might best represent the printing industry in this mix and as the various certification requirements develop. We recommended to SGIA that a common understanding and application of the term needs to be established, so that everyone is on the same page. Marci will keep NASMA informed on developments and SGIA's efforts. We, in turn, agreed to serve as a resource.

Finally, NASMA's Executive Committee announced several changes to our membership policy. Companies and individuals interested in joining NASMA must first be nominated and recommended to NASMA's Executive Committee by an existing member. To retain membership, companies will be required to participate in at least three of four meetings over a two-year period. There will be no membership dues for the coming year. We agreed to continue to suspend dues in favour of a nominal per-meeting charge.

What hasn't changed is NASMA's focus on North America. Membership will continue to be open to manufacturers in the print industry based, or with, a significant operating presence in North America. Member representatives should continue to be senior executives or managers.

NASMA's autumn meeting will be held in southern California on 1 and 2 November. ■

***Stephen W Kahane is Chairman of NASMA***

**Further information:**
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web: www.iccink.com

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