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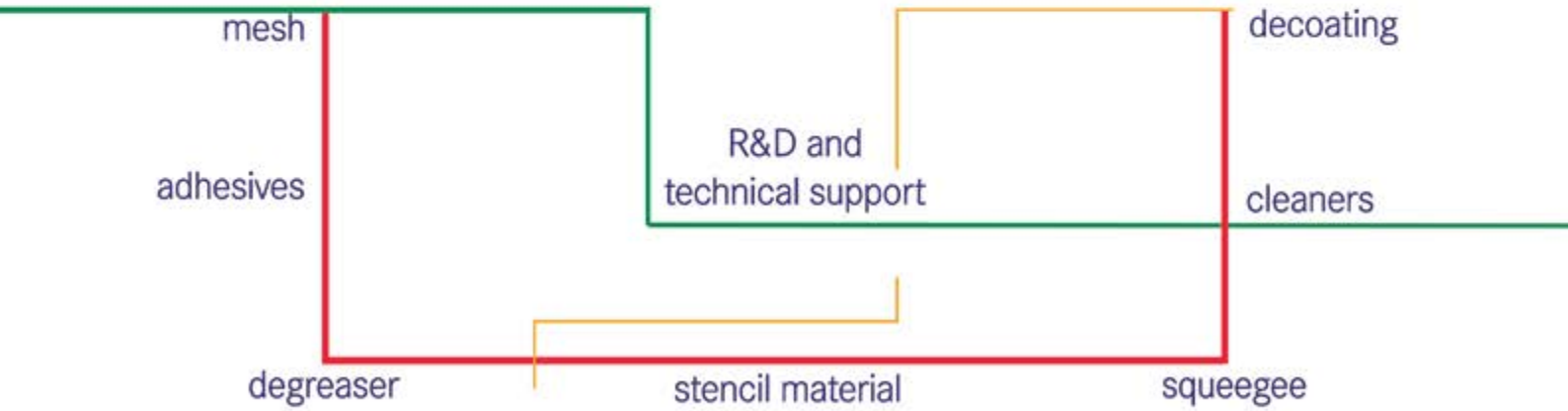

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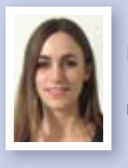

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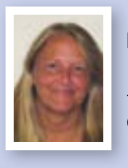

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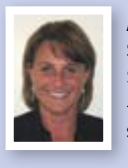

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QUALITY INVESTMENT

Mark Diehl explains why it's worth investing in computer to screen (CtS) technology

Computer to screen (CtS) equipment can be justified in a number of ways using financial tools such as Payback Period, Internal Rate of Return, and Net Present Value. Easy calculations, but then we also need to look at the opportunity to increase both quality and latitude in pre press by choosing the right CtS. No matter how good the press is, the quality cannot be put back into a screen at press stage. To increase profitability you need to improve the process.

The rate of return in a traditional ROI spreadsheet calculator (which can be supplied by most if not all CtS manufacturers) will be dependent on a number of factors including: number of screens imaged; current cost of film and supplies; labour to output the film and inspect (normally done by the art department); retrieving the film; film folder jacket; taping the film; storing the film; disposal of film (getting harder); physical steps to and from the printer and the screen room; time spent touching up pin holes after developing the screen; and most importantly, time spent registering screens on press.

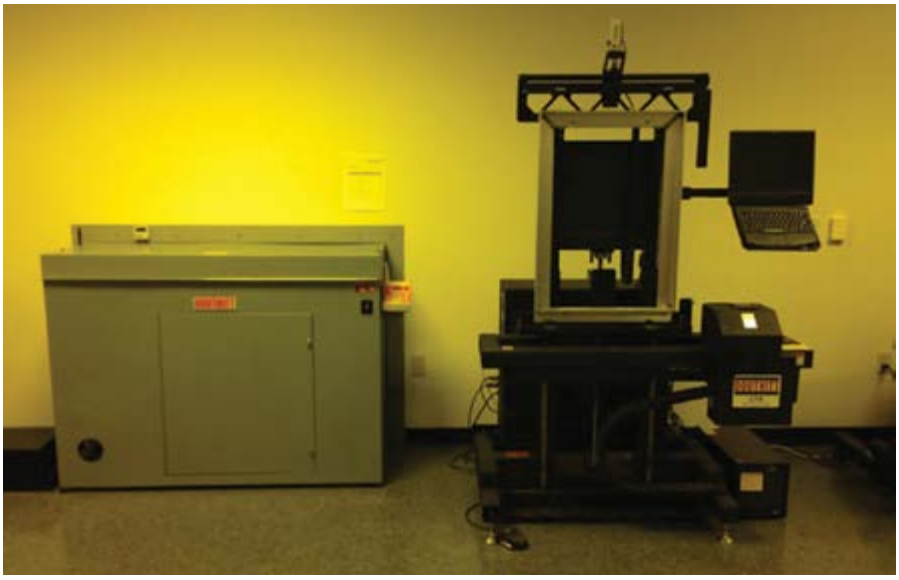
EXAMPLE OF CTS COST SAVINGS

The chart below illustrates the payback period for a customer doing only 32 screens per day and using the Douthitt Waxjet CtS including a new RIP for 25x36 or smaller frames. Purchase price was about $54,100 [£39,610] and **figure 1** shows the financial justification.

REAL NUMBERS FROM REAL PRINTERS

To show the fast payback system, starting in the screen production area we talked to Greg Kitson of Mind's Eye Graphics. Kitson has been using the CtS for many years and he said "I was thinking I'd be saving $2.00 [£1.46] per screen in film; the reality is, I was saving 15 minutes in time!"

You may not get that type of saving, but consider all the steps that go away and/or are shortened. The artist sends the file to a film output device; someone needs to unload, cut, package and transport that to the screen room; the screen maker opens the folder, tapes the film to the screen, lays it on the vacuum frame, waits for contact, exposes; the film goes back in the folder; after developing, the screen needs to be inspected for pinholes (dirt on glass or film) and touched up. With CtS, in less time than outputting the film you have a screen imaged, and because we do not need vacuum, glass or film, exposure time is cut by over 40%. Finally, because there is no film or glass: no pinholes!



Installing CtS can save a lot of labour and time on press

The more exciting savings have to do with the registration time on press. New Life Industries in Kentucky shared some numbers with us recently. When they were using film (and a film registration system) the average set-up time for an 8 to 10-colour job was nearly an hour. They switched to CtS (without an optimised registration system) and cut that time down to 20 minutes. Finally, they installed a Douthitt CtS with a MHM optimised registration system and are now doing set-ups in 8–10 minutes. All times are based on two workers and start when the presses are pallet ready and the operators start loading the screens. Richard Humble states these times are all on their MHM Synchroprint 4000.

At Mind's Eye, Kitson will see a typical five-colour set-up time reduced from up to 12 minutes a colour with film to 3–4 minutes a colour with CtS and his M&R. "In my contract shop that is an extra $1,000 [£732] or more per machine every shift," he said.

MHM and M&R presses have very different registration systems and it is important that the CtS and press registration systems are matched. Make sure your CtS manufacturer will adapt the registration system on their equipment [to suit] the press.

Continued over

Assumes a purchase price of $54,100.00 which includes the CTS 30 and the Xitron based Harlequin Rip and doing an average of 32 screens per day 21 days per month:

Payback period	10.51	months
NPV - net present value of savings in today's $	$7,303	12 Months
IRR - Internal Rate of Return	109.25%	yearly rate of return (average of three years)

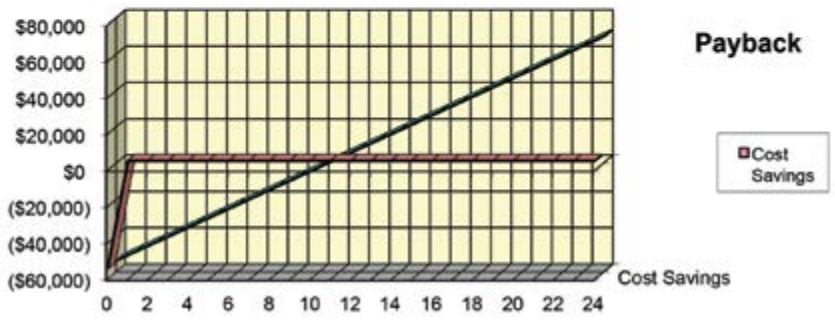


Figure 1:Douthitt diagram ROIbased

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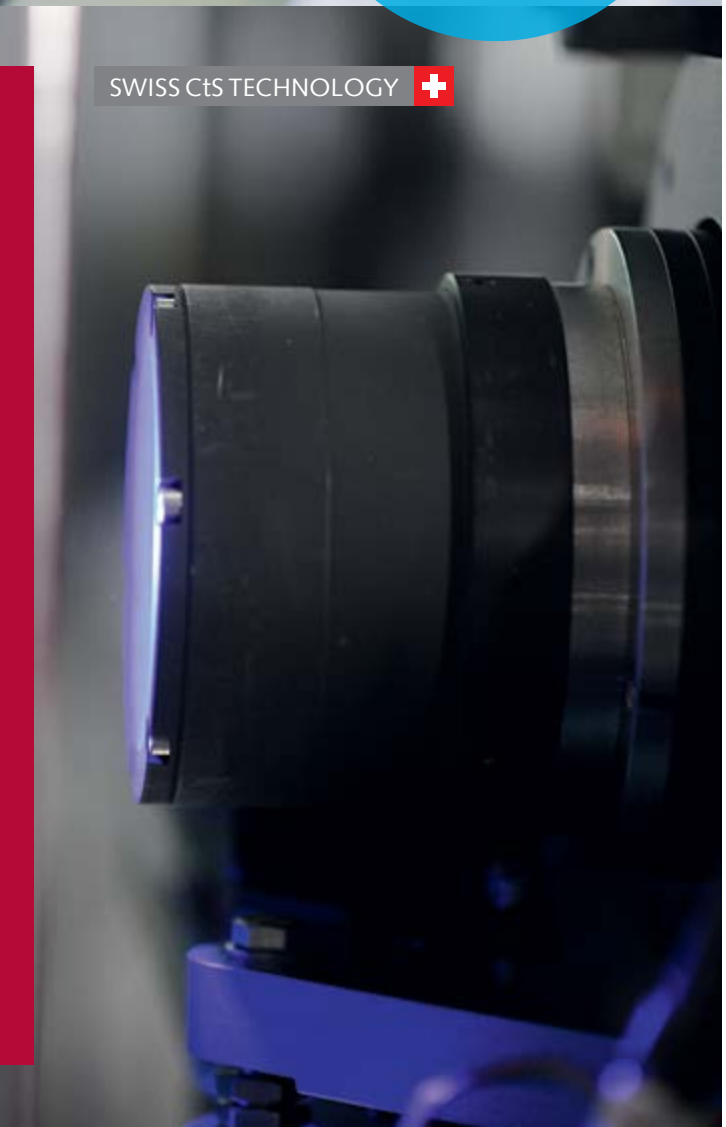

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SOME ADVANTAGES OF CTS TECHNOLOGY

- Elimination of film.
- Fewer processing steps including taping films on, vacuum draw down…
- Digital workflow eliminates the handling and storage of films.
- Elimination of leading cause of pin holes.
- Faster exposure times.
- First generation of art on screen
- Faster on press set-up and registration

Again, with 32 screens a day, the payback period is well under one year. This technology is easily justifiable to anyone with even one automatic and doing 15–20 screens per day. It is important not to settle for a low initial cost item that does not offer long term durability. You want to be sure the design and support allow for long term production use and quality with equipment that has a short and long term proven track record.

INK VS WAX CTS

Most CtS can save you a lot of labour and time on press. However, the other huge consideration is the quality improvement of wax CtS vs inkjet. The dot quality and detail of a good wax jet unit will greatly improve the quality over inkjet film or an ink jet CtS. Even with inkjet CtS, many customers still go back to film for 'quality jobs'. With wax jet CtS, you should never go back to using film for any job.

Considerations when choosing ink or wax:

- Incompatibility of some emulsions when it comes to ink. Less Latitude.
- Ink splatter vs. wax. Wax gives a much cleaner dot that does not spread with time.
- Ink density vs. wax. Wax gives a much higher density = correct exposure.
- Choosing emulsions based on exposure/ink rather than press process factors.
- Under exposing emulsions to compensate for poor ink density or need to expose fast.
- Need to change coating technique to compensate for the requirements of a ink-based system.
- Wax means that you do not need to revert to film to do 'quality' jobs.
- Issues with under exposure (durability of mesh and issues reclaiming).
- More tonal compression hurting image quality with inkjet than wax.
- Wax offers a smaller footprint and is more ergonomic to load. Advantages of the wax vertical design over the ink horizontal units.
- Environmental conditions are not as critical with wax.

Again, I stress the best part of screen printing is the latitude it provides but the worst part of screen printing is the latitude – in other words, often key steps or fundamentals are not optimised. The key is not to settle because it works for what you do now but strive for the best print quality on the shirt (the key is the printed piece) to stay competitive or ahead of much of the competition.

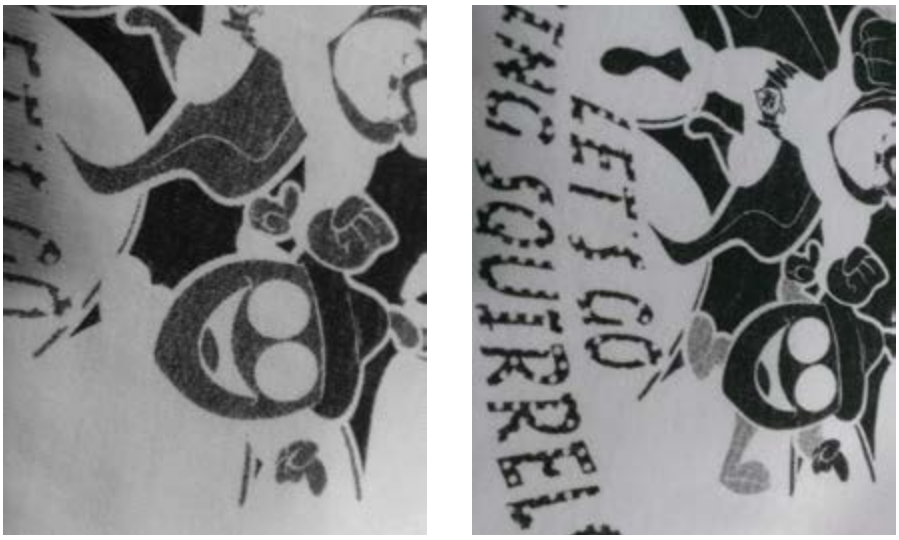

Figure 2: Comparing the dots held on ink vs wax (same screen and same light)

DIRECT COMPARISON

From a Dave Makin article published in *Screen Specialty*:

"I've been able to go into many shops that have both technologies side by side. We've produced the same image from both machines onto one screen. I've developed the wax and ink at the same time in one of the machines that prints and exposes, first by printing half on the wax machine, then the other half with the inkjet, then allowing the inkjet machine to expose the emulsion. After washout, both images looked good but, at the press, the waxjet image was by far superior. It was because of the density as much more detail was held with the waxjet. We had speed, quality and consistency with the waxjet that the inkjet just wasn't delivering." (See **figure 2**).

Compare, compare and compare. Send your coated screens to the manufacturer(s) you are considering and have them show you the speed and quality and then run the job on press. A customer in Pennsylvania does 500 images per shift on one waxjet from Douthitt. He did his due diligence and made sure the registration system and speed were all in place since his main factor was press make ready. The added quality was just the bonus for them.

POST-SALE SUPPORT

One of the most important factors is the level of support after the sale. Douthitt customer ThreadX said that Douthitt does not do a good enough job letting everyone know that their level of support is a huge advantage for them. It needs to be better 'branded'. Many people find out too late that they do not have the after sale support they expect.

ALWAYS STRIVING TO IMPROVE

Back to my Ford Motor roots in the 1980s when we had to study William Edwards Deming's philosophy. The work he did with automotive industry is legendary and he stressed improvement of the process every step of the way. Screen Printing is no different. On press is the wrong time to discover a problem, when it is more costly to fix. To paraphrase a few of Deming's many points:

1. Create a purpose toward improvement of product and service, with the aim to become competitive, to stay in business and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. (Definitely still true today for screen printing).
3. Build quality into the product in the first place. (All about the screen fundamentals in pre press and the right tools to achieve them.)
4. End the practice of buying equipment on the basis of a price tag instead of value and quality.
5. Always keep improving the system to improve quality and productivity, and therefore constantly decrease costs.

Quality and service are easy things to boast about – and many companies do – but the real measure of a company and its products is when the quality and service transcend words and are born into reality. Take time to be sure your new equipment of any type does NOT limit your latitude but instead takes you to the next level. Demand quality and service on every capital equipment. Douthitt is proud to be celebrating 100 years of manufacturing excellence later this year and is proud to have the fastest and most dependable waxjet unit on the market. ■

Mark Diehl is Managing Director of Douthitt

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DON'T HESITATE – AUTOMATE

Russell Weller takes a look at what automation can do for the wide format PSP

Automation is the buzzword of the moment but what does it actually mean to a Print Service Provider (PSP) in the wide format sector. A full automation project is for the longer term and for many companies it is a daunting prospect. Some see automation as scary – does it mean losing staff? Does it mean a lot of change? Many see the implementation as far too time consuming. Will there be extended downtime? Will the staff need training? Some see it as inevitable but might be putting off making that important decision.

Whatever stage in the thought process, the fact remains that globally, automation and robotics are recognised as part of our future! With current sociological demand for instant gratification, the aggressive drive for competitive edge and world pressure to reduce waste, we all need to look at the options to address the trends and speed up production, eliminate bottlenecks and automate our processes. No one is suggesting full automation is an overnight project but with the right partner and taking a step at a time, it is possible to add value to your business.

TRANSPARENCY AND SIMPLIFICATION

The average PSP wants to give their customer a top-quality product for a reasonable price in an acceptable turnaround time. A big hurdle for wide format printers is the complexity of some of the jobs. With rising volumes producing a massive amount of material, handling of differing parts and facets that need to be coordinated and shipped to different consumers, it can be a logistical challenge. One of the main advantages of automation is transparency. Every step of the workflow matters and the key to workflow efficiency is to identify all the areas of waste and standardise processes to eliminate that waste. Identifying waste in individual processes is not so difficult – it's understanding each step of a workflow and how they perform as a chain that can often be complex.

Historically the printing sector has always been cautious before trying out new things so we have put together an overview of how one supplier is providing support and assurance and helping wide format companies automate, work through the complexities and remain competitive.

What Esko does that is different from most suppliers is to look at a company's overall business strategy and start from there. For Esko it's not about providing products to address the individual elements and departments, it's about reviewing the whole production process from 'order in' to 'shipping a product out' and achieving an overall solution. Esko starts the process by working together with a company's team and asking questions: What keeps you awake at night – production speeds, waste reduction, materials handling, short delivery times, addressing a wider variety of orders? Are you worrying that your company/team are flexible enough to handle it all? Do you worry that your staff has

Continued over

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The Automation Engine brings together all of Esko's knowledge and creative software engineering

all the skill sets and experience necessary to meet the complexities of the whole process? Where are your bottlenecks? Importantly what is it you want to achieve?

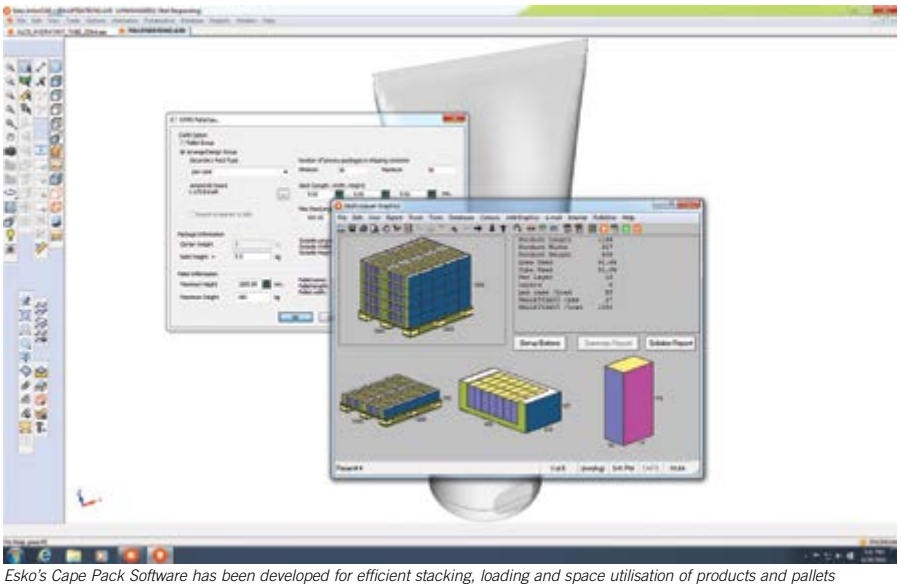
Esko has two key questions: 'What happens if?' and 'What happens next?' This usually highlights and identifies potential issues throughout the workflow. Each step and each task in the company's overall process is then analysed for review. Once each facet has been improved, full automation can then be achieved by threading together each automated task throughout the whole process as a functional activity. Upstream and downstream Esko works through and reviews the entire production process.

SOLVING CUSTOMER CHALLENGES

Esko's Automation Engine is a 'tour de force' bringing together all of the company's long standing expertise, knowledge and creative software engineering. To help companies begin Esko has recently launched Automation Engine QuickStart for Sign – a turnkey workflow solution specifically developed for sign and large format printers. Providing the ultimate in customer care, Esko can deploy the QuickStart tools in only 5 days – making for a smooth implementation and immediately boosting a company's capacity.

Russell Weller, Esko Product Manager says, "Where we can make a difference is in identifying a customer's day to day challenges. Esko' software manages data in a different way. The software shares the data and synchronises the information throughout multiple platforms and multiple devices. There are huge time-savings to be made by reviewing the data at each stage and focusing on bottlenecks and where decisions can be made to add value. There is no advantage in optimising or automating individual processes. The whole workflow needs to be connected."

Weller continues, "From a workflow perspective, it is important to design with finishing in mind to eliminate waste creation



Esko's Cape Pack Software has been developed for efficient stacking, loading and space utilisation of products and pallets

Esko Kongsberg cutting table with robotics enables efficient wide format production

along the path. With a clear understanding of the finishing process, display design can be optimised for maximum performance and minimal waste. Using ArtiosCAD's library of pre-designed production ready displays, a designer can maximise his creativity. There are endless and resizable variations including 2D and 3D plus reports and videos. These designs are all optimised for the Esko Kongsberg range of cutting tables. Our online, cloud-based library of downloadable designs have all been tested, ready for the customer to add their own graphics making it easy to test new concepts in the market."

FINISHING TOUCHES

Cutting, creasing, routing, milling – the key to in-house finishing is planning and control. In the finishing room, Esko has thought of every time-saving measure and device to reduce 'change over time' and simplify waste logistics. With a wide range of cutting tables and tooling systems, Esko provides an automation opportunity to multi-task with multi-zone operations and robotics for faster and more versatile material handling. The operator can clear and prepare one zone while the tables work on other parts of the production. At the end of the process Esko's Cape Pack Software has been developed for efficient stacking, loading and space utilisation managing more products and pallets within a single truck. Esko has considered every single possible pain point from docking options to large stack height for unattended operation. Cape Truckfill optimises product loads into trucks and containers to save on shipping costs.

Success can come from forward planning – looking at new ways of working and addressing the trends. As the wide format market continues to expand we see traditional print companies adding wide format equipment to their portfolio to help them diversify and extend their offering. We can see sign makers investing in wide format flat-bed equipment taking them into new markets. The competition is hot and business strategy has never been more important. With Esko as your 'Automation Partner' you can be confident of success. ■

Russell Weller is Product Manager at Esko

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TOUCH SENSITIVE

Salvatore Giuffrida explores the challenges involved in decorative printing for the front panels of household appliances

Our homes are increasingly digital, and ever-more connected. Household appliances can now 'talk' to us and each other, and can be remotely controlled via smartphones. The latest consumer durables are fitted with sophisticated front panels and integrated touch interfaces. This trend creates an urgent need for printing inks that are engineered specifically for the technical challenges associated with printing decorations on these substrates.

Screen printing is ideal for applying decorations to input systems. This method uses either solvent-based or UV-curable inks, and enables diverse colours and effects, in combination with functional layers. This makes it well suited to decorating the reverse (second surface) of transparent plastic and glass panels for high-quality capacitive input systems. A capacitive touch screen, in contrast to its resistive equivalent, operates without the need for mechanical pressure. The screen is not built from multiple layers; instead it comprises a single plastic panel made from PMMA or PC. Moreover, the overall look and feel is more in line with today's tastes.

GROWING DEMAND

Capacitive touch interfaces are found in a wide variety of appliances, including washing machines, driers, dishwashers and ovens – and even coffee machines and microwaves. This translates into a growing need for decorative printing of front panels, with a corresponding rise in technology and design challenges. With these requirements in mind, specialist ink manufacturer Marabu has expanded its portfolio for front panel printing.

SOLUTIONS FOR HOUSEHOLD APPLIANCES

Marabu's Mara Panel MPA, a new line of specialty decorative inks, features an opaque white, plus a deep, non-conductive black developed specifically for printing on the back (second surface) of popular PMMA or PC plastics – both extruded and injection-moulded.

Front panel printing for household appliances such as washing machines

The majority of decorative prints for household appliances are in black or white. However, speciality inks for silver-metallic effects mimicking the appearance of aluminium or stainless steel are also available from Marabu.

Operating panels often include displays for the time, date or machine-function symbols. For these substrates, it is possible to use a combination of Mara Panel MPA inks and varnishes. These comprise the diffusor and filter products in the Mara Star SR range. They can be employed for transparently coating the display window within the panel, and are suitable for LED backlighting.

DURABLE AND USER-FRIENDLY

Mara Panel MPA decorative inks display very high electrical resistance to avoid interference with the input system's functionality. Furthermore, the range has been tested for resistance to water vapour (condensation test of up to five hours at 70°C, 100% relative humidity) and with common chemical cleaning agents from leading manufacturers. This demonstrates that the products are not subject to surface irregularities or flaking.

In addition, other visual characteristics, such as crisp edges, excellent flow, white lightness (L value), colour coordinates L*a*b value), and high transmission density, ensure long-lasting prints of the type required for consumer durables. In terms of its feedstock materials and hazardous rating, the Mara Panel MPA range is state of the art. It is therefore extremely user-friendly in terms of the printing process, and health and safety requirements are less stringent.

In many cases, household appliances feature plastic panels within a metal housing. Marabu offers solutions for the entire device, even if individual components are made from differing materials, i.e. plastic, metal or glass. This mix of materials is becoming more common, as glass fronts are increasingly popular for household appliances. They combine an elegant look with a tough surface that does not easily scratch or soil. For glass panels, Marabu offers its highly resistant, two-component Mara Glass MGL and Tampa Glass TPGL ink lines. The tried-and-trusted Ultra Glass UVGL range is recommended for applications requiring UV-curable inks. ■

Salvatore Giuffrida is Technical Service Manager at Marabu

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PULP FACT NOT FICTION

John Corrall describes some of the issues involved in decorating pulp packaging with inkjet

The world of packaging is changing. The hedonistic throw away culture of years gone by, where plastic was king, is already a fading memory. The future sees a rejection of the practices that poison our oceans and contaminate our land for generations, instead favouring the recyclable and the sustainable.

Leading the way in this revolution is pulp. This product is made from recycled cellulose, sugar cane or even grass. It has a multitude of potential uses, from internal packaging for electronics to egg boxes, disposable plates to fruit punnets, it can be used for salad boxes or even detergent packs. It can be light but strong and can even be made grease-proof.

The next question is how to decorate these new packages. Nothing looks more drab on a shelf than endless grey or brown packages, so they need to look brightly-coloured and appealing. However, any decoration has to de-ink easily for recycling. For long production runs, flexo is currently used, but for short runs or runs with a lot of variation (for example different types of fruit in the same size punnet) this can mean that more pulp cartons are used for setup than in production (hardly a green solution). Using labels is then the logical alternative, but these can cost more than the pulp carton itself, potentially ruining the commercial viability.

So what if an alternative was possible? Print direct to the pulp carton using economic and safe water-based inks in vivid colours? Surely that would be the perfect solution?

And in order to achieve this goal, what are the technical challenges to be overcome?

THE RIGHT INK

As with most inkjet projects, the printing hardware has to be right, but the ink is the key. Without the right ink no project will ever succeed.

In the case of pulp packaging the demands on the ink are widespread:

Bright colours: It's obvious that bright or strong colours will be needed – but they need to remain bright on what is often a very absorbent material. The water content of the ink may be absorbed quickly, but the pigment needs to stay on or near the pulp surface. Also the carton material itself may be an off-white colour or may be pre-coloured (grass-based pulp packaging is – not surprisingly – green in colour).

Regulatory Requirements: If the carton will be used to hold food then the relevant regulation is EC1935/2004. For the printing ink most customers expect compliance with Swiss Ordinance SR 817.023.21. This regulation defines the materials that may be used in a printing ink for 'non-direct food contact'. There are tests to check what will migrate out of the ink and into any food contained. We need to worry not just about ink that penetrates through the carton wall from the outside to the inside, but also any cross-contamination between the ink on the outside of a carton and the inside of the carton below it when they are stacked together.

IIJ ColourPrint 72 T full colour 'tower-mode' printer for pulp carton. Note that the 'nose' of the printer tilts to match the slope of the carton side

Cost: As ever the economics will make or break the project. Inkjet ink is always going to be more expensive per-litre than flexo ink but this is compensated for by the lack of setup time (and therefore setup cost) and the lack of waste during setup. The economics will obviously change a lot depending on the extent of the decoration required. For example the cost of printing a small picture of a strawberry or a plum, plus some text and a barcode, might be only 10% of the cost of decorating the entire top and sides of the carton.

Pulp Media Type: 'Normal' water-based inks usually work well on regular pulp cartons. The problem comes with grease-proof cartons that have had the pulp material treated with a hydrophobic coating. The ink simply sits on the surface of the carton and can easily be 'smudged' with a finger. With this kind of material we can use a pre-treatment such as a primer to help fix the ink. Or we can use an alternative ink such as a water-based polymeric ink that will 'fix' to the pulp surface when heated. In either case there is an additional cost to be considered.

INKJET SYSTEM

As with any inkjet hardware to be used in-line in a production environment the system will need to be very reliable. After that there are several aspects to decorating pulp cartons that are a little unusual:-

Orientation: High-quality colour inkjet print in an industrial environment usually uses piezo drop-on-demand technology. These inkjet printheads have open nozzle holes and the ink is prevented from falling out by careful application of a small vacuum to the ink supply system. This works fine when printing downwards (for example onto the carton lid) because all of the nozzles in the inkjet

Continued over

Ink throw distance testing

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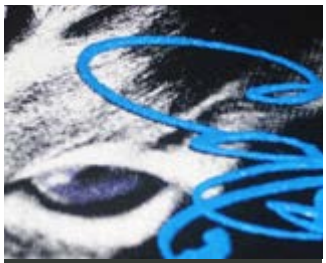

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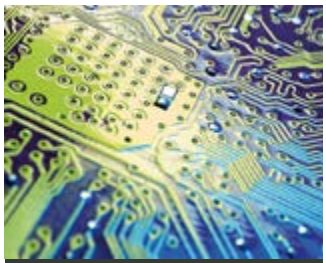
HABITAT



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Inkjet-decorated pulp cartons (lid top and sides)

printhead are at the same height and see the same pressure. However when printing cartons such as fruit punnets we need to print both sides of the punnet at more or less the same time. The inkjet printheads are now in 'tower' mode, i.e. the row of nozzles is vertically upwards. The nozzles shoot sideways onto the sides of each punnet as it moves horizontally past. The ink pressure at the top of the printhead is always going to be less than the ink pressure at the bottom of the printhead. For this to work we need a printhead with a wide 'pressure window'. A combination of the non-wet coating on the inkjet printhead, and the shape of the tiny nozzle cone, allows the ink meniscus to survive a significant change in ink pressure along the length of the printhead.

Ink Throw Distance: Pulp cartons usually have a textured surface and are not highly accurate in their overall dimensions. There may be individual paper fibres sticking up. They also tend to have steps or lips in their design in order to add strength. All of this means that the inkjet printhead cannot get close to the carton or there is likely to be a crash. From our experience at IIJ we are normally asking the inkjet printhead to 'throw' the ink drops between 3 and 5mm to the carton surface. To an extent this conflicts with the customer's desire for the highest possible print quality. High quality print needs small ink drops, but small ink drops won't fly far before they lose momentum and blow away. The best compromise seems to be around 14pL drop size. Quality is still rated as 'good' but we can print well onto cartons with curved or stepped surfaces.

ENVIRONMENT

Dust: Pulp carton is dusty. Dust gets onto the inkjet printhead nozzle faces and interferes with jetting. This causes missing nozzles in the print and production has to pause while the printheads are cleaned. The most important thing to consider is how to prevent dust reaching the inkjet printheads in the first place. Airflow is very important, so an air-knife may be used to remove dust from the carton well before it approaches the inkjet, and the area around the inkjet might be kept at a positive air pressure. It's also important that when cleaning of the printheads is eventually required, the process is very quick and minimises down-time.

Heat and Humidity: If we are printing the cartons soon after manufacture then we have hot, wet cartons passing close to the inkjet heads. The heat could potentially cause drying of the ink in the nozzles, while the humidity could cause condensation i.e. water droppings forming on the cooler inkjet printheads. As with dust issues the solution involves airflow. Gently blow away the warm, wet air and the problems are resolved.

DRYING

Drying of the printed ink should not be forgotten. Our experience is that on dry cartons a NIR (near infra-red) lamp is an effective solution for drying the ink. However if the decoration is to be done in-line directly after carton manufacture then the situation is different. In that case the pulp is still wet – perhaps around 7% water by weight depending on the manufacturing process. Since the ink is water-based this doesn't seem to impact print quality – but it does make drying difficult since in effect the dryer is drying the carton as well as the ink. In this case we have found that hot air can work very well (although it takes up a lot of space).

Demand for pulp carton is about to explode, and the use of inkjet for decoration may well be the 'next big thing' for our industry. ■

John Corrall is Managing Director of Industrial Inkjet

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DIGITAL OVER ALL

Dr Anke Pankoke explains how Digital Lacquer Embossing changes the look and feel of surfaces

The production of digitally printed materials is becoming increasingly popular – whether in the flooring, furniture or building materials sector. Customers expect that the look of a surface will match its feel. Various processes are available to cater for their needs. All established methods have one thing in common: unlike printing processes, they are not digital, but analogue. Hymmen has developed a solution for this dilemma which is now patent-pending: Digital Lacquer Embossing.

GROWING IMPORTANCE OF DIGITAL DECOR PRINTING

To understand the current importance of digital printing worldwide for example in the flooring industry, one only has to take a look at the production volumes attained: at present 40 million square metres are manufactured with Hymmen's JUPITER Digital Printing Lines alone. And this is only set to increase. Manufacturers are increasingly taking advantage of the benefits of digital printing on an industrial scale:

- Industrial production of small output volumes per decor
- Integration of digital printing in the process chains of the decor industry
- Individualised mass production
- Fast response to market trends
- Shorter time to market
- Shorter set-up times
- Lower storage costs
- New design options (register lengths, colours, visual depth) (see also **Fig. 1**)

THE NEED FOR AN AUTHENTIC FEEL

If we consider the example of flooring, its key properties do not just include the look, but also the feel. The feel is typically created with the help of pressing plates or structured rollers. This results in the following dilemma: although digitally printed décors are becoming increasingly popular, all associated benefits are thwarted by the analogue structuring process.

"We therefore believe that digital textured printing offers major market potential," commented Dr René Pankoke (see Fig. 2), Managing Partner and CEO of Hymmen. This is what prompted Hymmen to develop a process for digital surface structuring that is suitable for industrial applications.

PREREQUISITES FOR THE INDUSTRIAL CAPABILITY OF DIGITAL STRUCTURING

"We firstly have extensive experience in digital decor printing," said Pankoke, explaining the background to development of the new

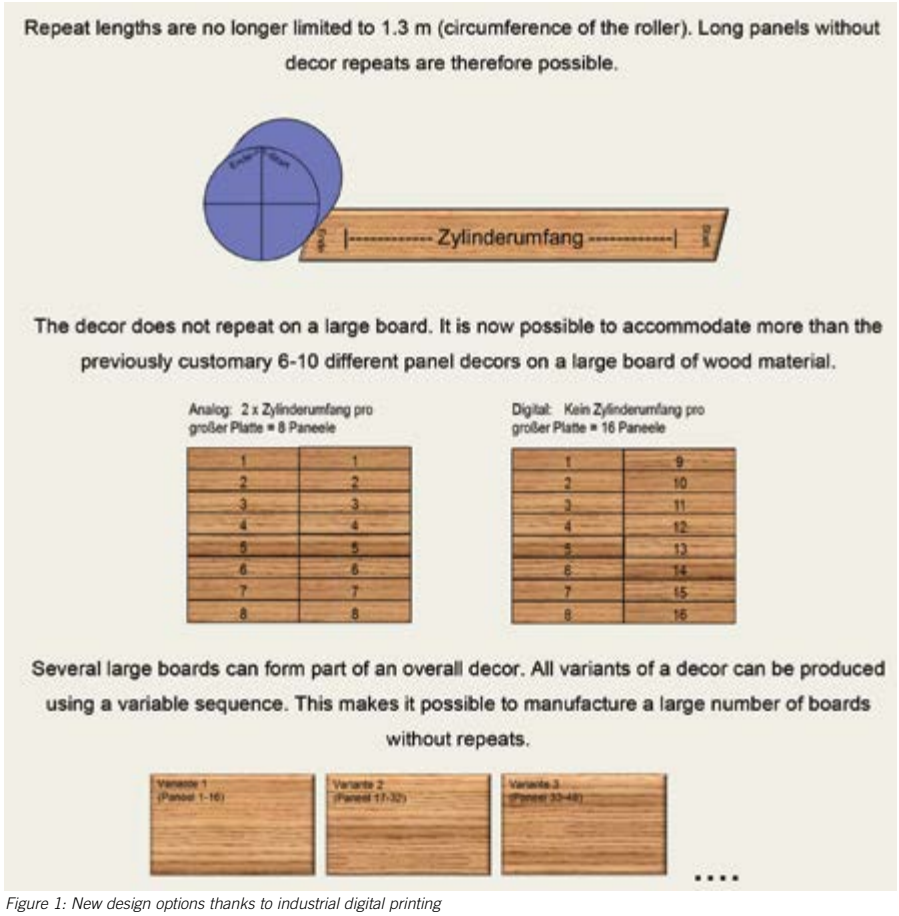

Figure 1: New design options thanks to industrial digital printing

Figure 2: Dr René Pankoke, Managing Partner and CEO of Hymmen

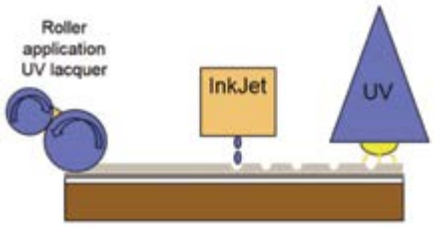

Figure 3: Diagram of the Digital Lacquer Embossing process

Figure 4: A lacquer surface which is not yet fully cured as it passes along the Hymmen JUPITER Digital Printing Line at the pilot plant en route for Digital Lacquer Embossing

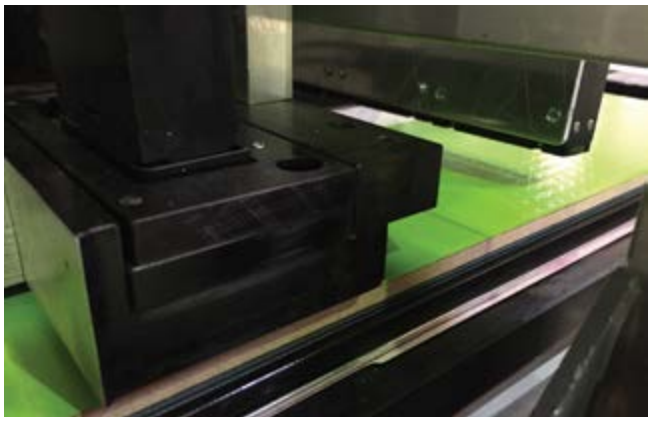

Figure 5: A digitally structured surface at the outlet of the digital printer

product. "Secondly, from our expertise in liquid coating we knew that customers make high demands on structured surfaces. If they are not satisfied, new technology will have no chance of supplanting established processes." This was the reason why, for example, initial efforts with a structure created with a digitally positive application method were discarded, as the result did not live up to the requirements on abrasion resistance.

"The numerous trials at our pilot plant in Rödinghausen and discussions with customers gradually brought to light the key conditions digital structuring needs to satisfy to be suitable for industrial applications," recalled Pankoke, summarising the company's findings when developing the process. The requirements are:

- A structure depth of 10–90 microns.
- Embossed in register (EIR) to the decor of the surface
- Surface quality to be preserved. This varies between products (furniture, flooring, etc.)
- Different gloss levels
- Creation of a depth structure resembling real wood and not a positive build-up of the structure
- Option of adding the technology to an existing conventional lacquering line

THE INNOVATION: HYMMEN DIGITAL LACQUER EMBOSSING

Following extensive laboratory testing, Hymmen filed a number of patent applications and presented the technique of Digital Lacquer Embossing to the public for the first time at InPrint 2016. This was the response to a customer need for the appearance and feel of a surface to match, while looking absolutely natural as well. The first product samples of highest quality were shown at the Interzum and the Ligna 2017 and are awaiting the visitors at the Xylexpo and the IWF 2018, too.

With this innovative technique, which is the subject of several patents granted, a transparent liquid medium is printed into a layer

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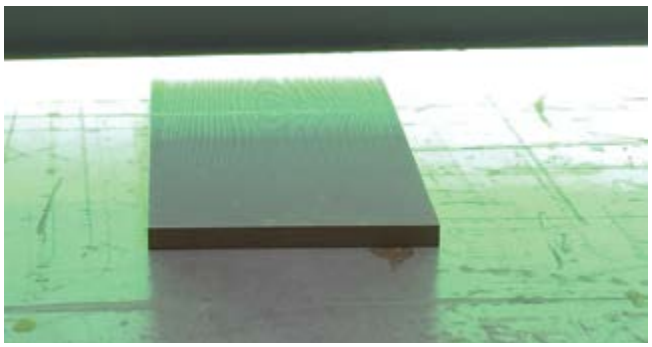

Figure 6: Surface displaying a digitally applied woodlike structure at the inlet to the UV dryer

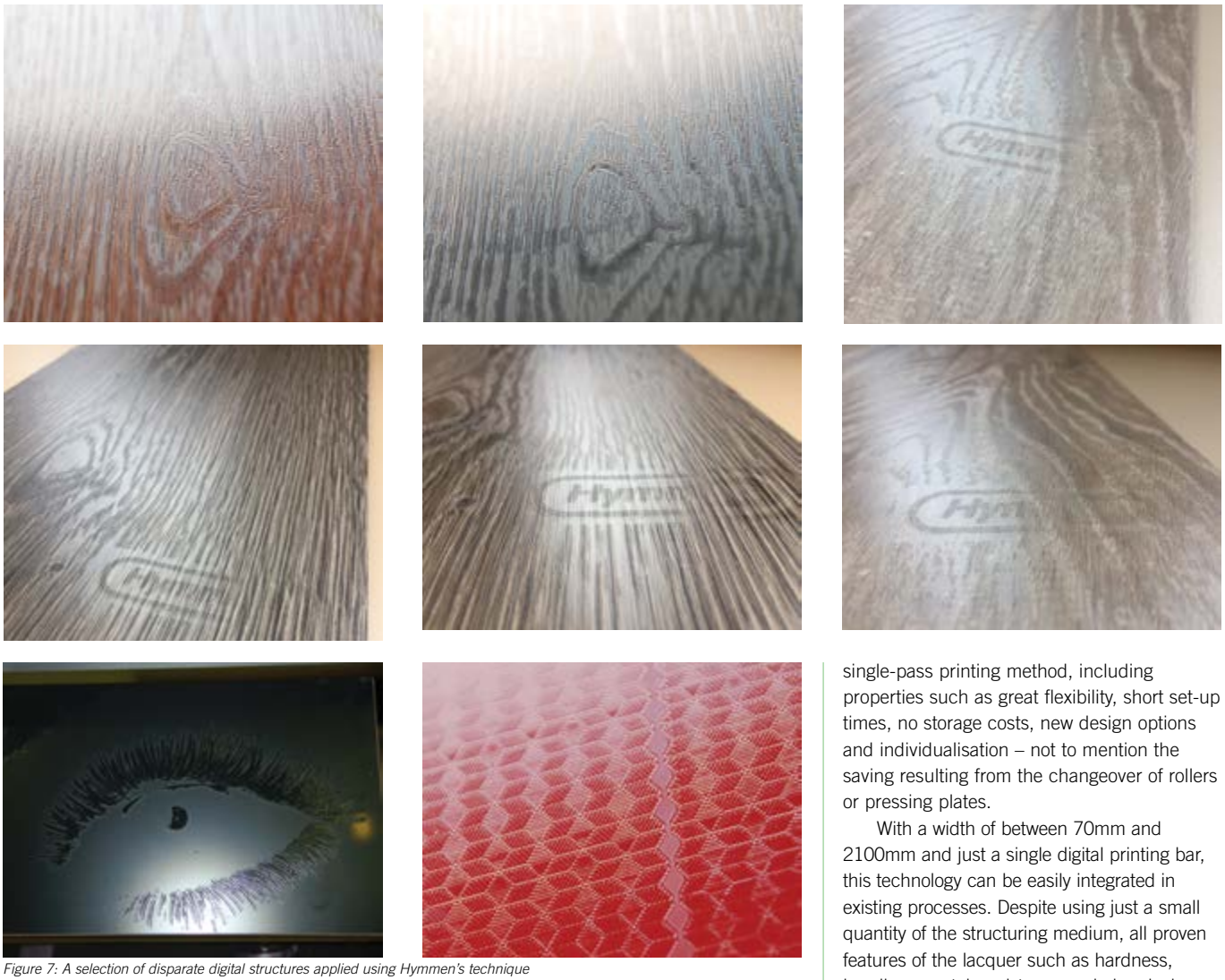

Figure 7: A selection of disparate digital structures applied using Hymmen's technique

of conventional, non-cured lacquer. This is accomplished with the tried and tested technology of the Hymmen JUPITER Digital Printing Lines. The structure is then brought about by subsequent physical and chemical reactions. The diagram in **Fig. 3** illustrates this process.

Digital Lacquer Embossing takes advantage of all commercial and technical benefits of Hymmen's tried and tested digital single-pass printing method, including properties such as great flexibility, short set-up times, no storage costs, new design options and individualisation – not to mention the saving resulting from the changeover of rollers or pressing plates.

With a width of between 70mm and 2100mm and just a single digital printing bar, this technology can be easily integrated in existing processes. Despite using just a small quantity of the structuring medium, all proven features of the lacquer such as hardness, bonding, scratch resistance and chemical reliability are ensured here. Lastly, it is possible to create structures that are embossed in register to the decor of the surface, whether with digital or analogue printing.

Fig. 4 shows a workpiece where the surface of the lacquer is not yet fully cured, as below the

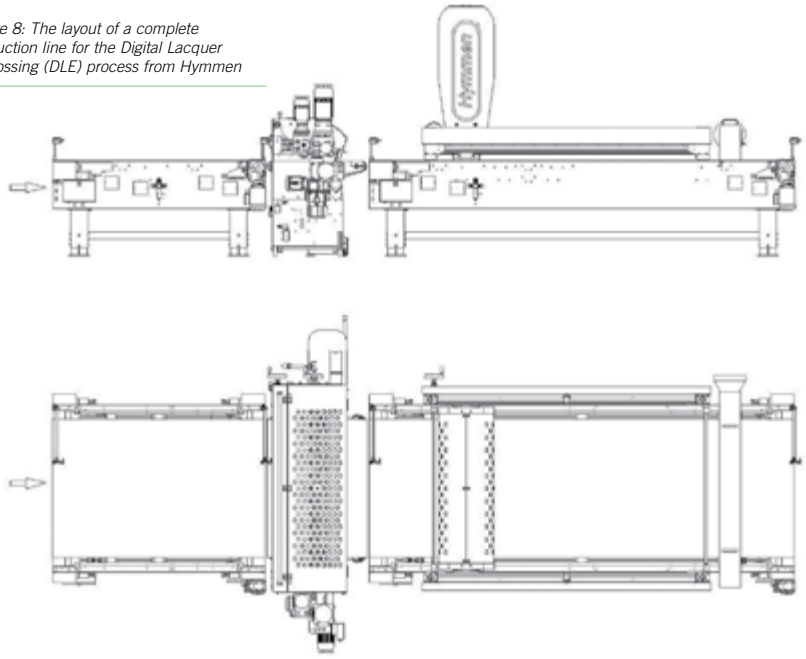

Figure 8: The layout of a complete production line for the Digital Lacquer Embossing (DLE) process from Hymmen

row of printing heads at Hymmen's pilot plant. In **Fig. 5** a digitally structured surface can now be seen, directly after the structuring process. **Fig. 6** shows a digitally structured surface patterned as wood before it passes through the UV dryer. In **Fig. 7** a comparison can be made between a selection of disparate structures which were applied digitally.

'HUGE INTEREST'

"We produced extremely high-quality samples at our pilot plant in Rödinghausen in preparation for several fairs, e.g. Ligna and Interzum 2017 and Xylexpo and IWF 2018," said Carsten Brinkmeyer, Head of Division for Digital Printing and Liquid Coating at Hymmen, in explanation of the figures/photographs. "The technique of Digital Lacquer Embossing met with huge interest at the trade fairs." To ensure [it meets] the capacity for the customer trials planned, Hymmen has installed a complete test line at its pilot plant in Rödinghausen. **Fig. 8** illustrates the layout of such a production line. **Fig. 9** shows the key element of the plant: the digital printer.

Seeing and feeling authentic surfaces is made possible using Hymmen's industrial digital printing process, with Digital Lacquer Embossing providing an extra option for surface finishing. ■

Dr Anke Pankoke is Head of Marketing and PR at Hymmen

Figure 9: The centrepiece of the plant: The JUPITER Digital Printing Line for DLE with just a single row of printheads

Figure 10: The JUPITER Digital Printing Line for DLE here with two rows of printing heads at the Hymmen technology centre

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Colour matches under one light setting can sometimes appear dissimilar under another

SEEING THE LIGHT

Laura Patriquin discusses the importance of lighting in colour matching

Remember 'The Dress' back in 2015? What was your take – white and gold, or blue and black? The discussion divided the internet (and perhaps a few friendships), but it was more than an online sensation: it brought to light how our perception of colours is far from consistent.

In fact, the extent that lighting affects colour matching is a frequently-asked question for Nazdar Ink Answers, a service that offers advice to print professionals. According to Nazdar's specialists, lighting can have an enormous effect on both a print's appearance and when colour-matching. You could achieve a good contrast in one type of lighting, then see it washed out in another type, for example. Similarly, a print may have subtle warm tones in one setting and appear overly orange in another.

END USE VARIABLES

Ideally, prints would always be proofed in their exact end-use environment – if a print is going to mainly be seen in daylight, it makes little sense to proof its colours under a desk's fluorescent lighting, for example. However, since this isn't always feasible, accuracy and consistency of proofing are essential throughout production. Such practices have been set in the ISO 3664 document; by adhering to both the Lighting and Environment standards it describes, you can expect to maintain colour expectations.

Technology can also help overcome the limits of the human eye. A spectrophotometer can be used to capture and evaluate colour to provide a valuable starting point for colour-matching. However, spectrophotometers can't always take into account all factors, such as end-use lighting, and can be affected by optical brighteners in substrates and inks, making the reading less reliable.

OPTIMUM ENVIRONMENT

Moreover, because of differences in substrate and/or ink composition, even colour matches under one light setting can sometimes appear dissimilar under another. Pantone's Lighting Indicator stickers can help. Under standard D50 Lighting, the two colours appear to match, indicating that your lighting conditions are good for evaluating colour. However, when the lighting condition is changed, the difference between the colours is evident, showing that your light is not optimum for colour-matching. Whatever your end-use lighting conditions, it is important to consistently proof under these settings at each step.

Nazdar also advises its customers to create the best proofing environment they can. All non-target surfaces in the colour-matching area should reflect as neutrally as possible, as to remove even subtle contaminants that can affect your print's apparent hue. Ensure lightbulbs are evenly spreading light across the area and change lightbulbs regularly for consistent light intensity; remove other light sources, brightly coloured or reflective clothing and other objects from area; and paint walls the ISO-standard neutral grey.

By maintaining strict colour-matching standards and accounting for lighting's influence, colour can be accurately managed throughout the print process – meaning no arguments over whether your print is white and gold, or blue and black. ■

Laura Patriquin works in web design and marketing at Nazdar

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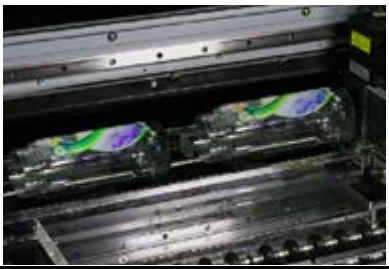

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MANAGING COLOUR DEVIATIONS IN THE DECORATING INDUSTRY

Jan Seguda explores the challenge of recreating specific colours and reveals how to get it right first time.

In the decorating industry manufacturers are often required to reproduce the same designs repeatedly over a longer period of time. In areas such as the ceramics sector, production conditions change a great deal; for example, due to the fluctuating properties of kilns or to variations in the natural materials used. As a result, it can be a challenge to reproduce a design without any visible differences.

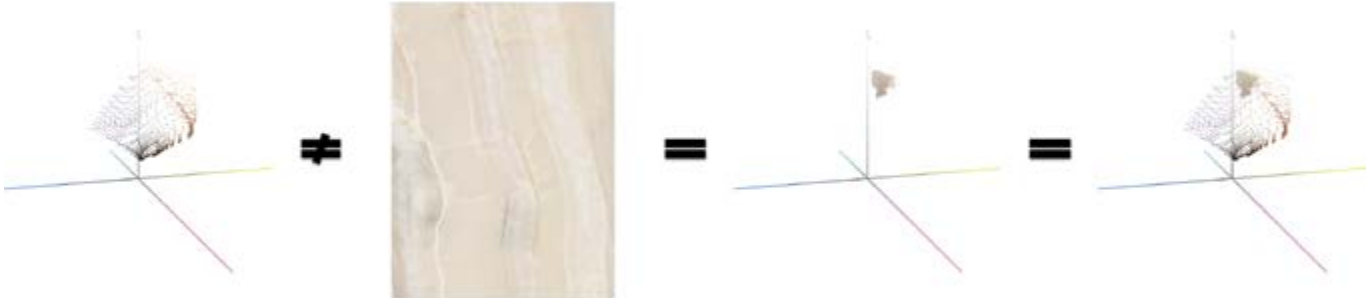
The complex method for adjusting colour in response to unstable production processes includes changing the print head's voltage, to regulate the amount of ink applied (e.g. colouring a glaze) to compensate for colour casts and retouching the file.

COLOUR CHALLENGES

Even a well-trained technician faces challenges in different industrial printing environments; for example, the missing support of colour modes beyond CMYK (five or more process colours). In addition, very

Continued over

Design (e.g. TIFF) + *colourimetric specification* = *digital master (FPF = Fingerprint file)*



Standard ICC profile *Design* *Colours of design* *Fingerprint profile*

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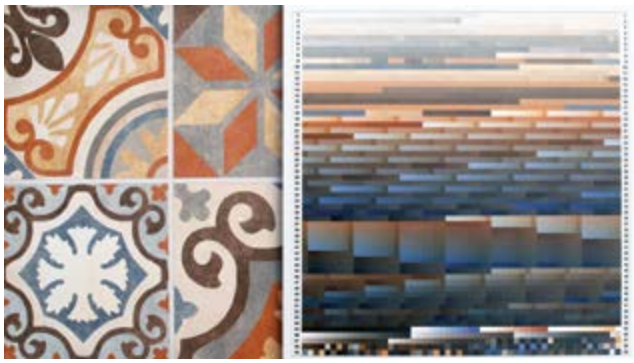

Printed result and corresponding Fingerprint target

dark substrates with process colours whose L-value is higher than the white point, and have extremely small, non-linear colour spaces, which – depending on the software used – allow the mapping of distant out-of-gamut colours to mutate into gambling, represent considerable hurdles. Furthermore, décors often consist of many shades of similar or fewer colours and are therefore less forgiving of interpolation errors than a photographic design.

On top of all these problems, the abstract correction of colours via RGB values or CMYK values for a 6c device with non-standardised colours, even on a calibrated screen, is considerably more difficult than the direct reduction of an ink in the respective channel of the print file.

LABORIOUS APPROXIMATION BY HAND

In many companies, a single profile is often used per printer, regardless of how many colour-changing variables are present in the production chain. This profile is used to create initial separations of a design using specialised software. The printed result, which usually has little in common with the original target, is compared with a physical reference. Subsequently, the information in the separated print file is altered channel by channel using a tonal correction or gradation curve, as the operator suspects that it will shift the print output to the target colour. This process is repeated until the desired colour is reached during printing. With each new edition of the décor, the last print file is reprinted and corrected iteratively in case of colour deviations, as described above.

A great deal of time is involved with consistent production interruptions and an additional investment of materials through test prints. Moreover, each correction can lead to a loss of drawing which accumulates over time and – in the worst case – renders the file unusable. In addition, the ink consumption during manual file handling will always be higher in comparison to software handling. As well as higher costs, this also results in lower production stability and greater susceptibility to colour fluctuations under varying light sources.

CHANGING THE MASTER FILE

Things can get tricky when the ink supplier changes; if the number of inks changes; or if another printer is purchased on which the design is also to be reproduced.

Even if software which allows conversions of multichannel data is used and the initial profile is stored to be used as input, it would describe the colours incorrectly due to the manual retouching, thus also not delivering the desired result.

Assuming appropriate knowledge and with the necessary software, a possible approach would be to adjust the colour of the design prior to the transfer for the previous production line by means of trial and error and then immediately generate a fresh ICC profile. This profile, in combination with the print file, can now form the basis for a colour conversion to the new printing conditions.

QUICK AND DIRTY

Although in most cases this method is likely to lead to the end goal faster than previously described, it is nevertheless associated with a high manual effort. This is predominantly due to the necessity of printing the design in the correct colour. It must also be expected that the quality of this colour space transformation will not be the best outcome due to interpolation errors. These interpolation errors occur because input profiles should not contain linearisation. However, depending on the condition of the printer, a profile target which is printed without prior linearisation will probably lead to redundant patches; a more or less inhomogeneous distribution of measurement data; a general shift to dark tonal values, and will therefore be less accurate.

A FINGERPRINT FOR LIFETIME STORAGE

To meet these challenges, ColorGATE invented Fingerprint technology, which enables high-quality and efficient reproduction. Based on the final print data of a reference design, a design-specific fingerprint target is generated. This contains all the colours that actually occur in the design, which are converted by the software into a measurable layout with colour patches.

This fingerprint target then passes through the entire production line, exactly like the original reference design. All production steps that have an effect on the final colour result thus also influence the creation of the fingerprint target. This results in a measurable colour reference with all colours of the physical reference having exactly the same colour properties. The target must then be measured with a colourimeter. This converts the physical reference into a colourimetric reference. Afterwards, the digitised reference is added to the print file of the design.

MINIMISING INTERPOLATION ERRORS

The result is a Fingerprint production file that can be reproduced on any production line – as long as it covers the required colour space of the design – and thus forms the virtual image of the physical model of a design. When an updated edition is released, new converted print data for the production printer is generated from the fingerprint production file. These usually lead to an immediate match between output design and reproduction, since interpolation errors are strongly minimised by the exact colourimetric specification of the reference, independent of linearisation.

Even if some process parameters have changed in the meantime, this method produces a very good colour approximation, so that the manual retouching effort can be reduced to a minimum. In order to check the suitability of a production line for colour reproducibility prior to production, the Fingerprint Module can also be used to load the design-specific colour values into a gamut viewer.

INFINITE REPRODUCTION

With the same design reference for all production lines, locations, printers and material variables, not only are the administration effort and error sources minimised, but corruption of production files (caused by tone value loss from continuous retouching) is also prevented.

This technology ensures that the same décors can be reproduced at different production sites under different conditions and that the quality is maintained over a long period of time. So it is not only the calibration of the printer repeated exactly, it is a calibration based on the design itself. ■

Jan Seguda is Product Manager, Industrial Printing

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BEST OF BOTH WORLDS

Geoff Baxter runs through the advantages of hybrid garment printing

A screen-printing press that runs on both gas, and electricity? Close, but not exactly. Hybrid is a fairly new technology that utilises both screen, and digital inkjet technology to print garments with bright colours, amazing detail, minimal pre-press, and very fast time to press.

The first-down colour, usually white, is screen printed in the traditional fashion commonly using either water-based, or a high solids acrylic (HSA) ink. Discharge inks can also be used with properly dyed cotton substrates. These inks are the system of choice as the water-based digital inks will naturally adhere to them, and together they produce a 'green' print, free of phthalates, PVC, formaldehyde, and other 'nasty' chemicals.

ADVANTAGES OF HYBRID PRINTING TECHNOLOGY

Overcoming many of the limitations of current digital garment printers.
Conventional DTG systems print well on nearly any fabric, as long as it's cotton. This is largely a result of a lack of bleed resistance, elasticity, and poor adhesion to many synthetic substrates by the white ink layer. By utilising a screen printed white, we can print hybrid embellishments on any material that can be screen-printed. Cotton, blends, polyester, high elongation performance fabrics. If it can be screened, it can be printed with a hybrid system!

Very fast time to press.
Instead of having the art department create a multi-colour separation, then produce screens, mix inks, set up 10, 12, maybe 16 colours, they only need to open the file, possibly create the white under-base (this can be done by the RIP), and go to press. Literally 15 to 20 minutes from the time a full colour design arrives it can be on press.

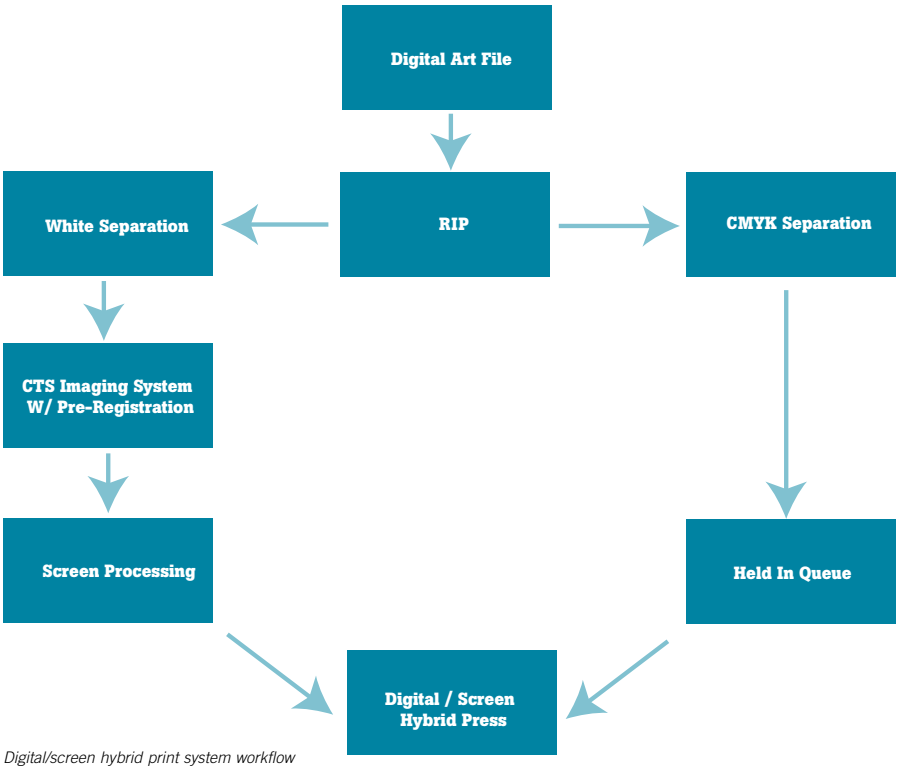
Minimal art prep.
Since the RIP largely produces the pre-press automatically, the need for a specialised separation staff can be reduced, or even eliminated.

Lower per-print cost.
Digital inks are far more expensive than traditional screen print inks. While digital white can sell for up to $1000 [£748] a gallon, high solids acrylic (HSA) screen inks are priced in the $50 to $60 [£37 – £45] a gallon range. Just printing fast is not the only issue, you have to print fast and produce products at a price point that is palatable to the mass market. Consumable material costs for straight DTG digital prints can average between .50 and $2.00 [£0.37 – £1.50]. For low volume, multi-colour prints you may be able to charge $10.00 or $15.00 [£7.50 or £11] per garment, but volume-printing costs need to be more in line with conventional screen-print costs, and Hybrid does this.

The M&R DS-4000 Digital Squeegee with the Stryker Automatic Oval Screen Printing Press

Eliminates the need for pre-treatment.
Ask any DTG printer what the Achilles' heel of the process is, and most likely the response will be "pre-treatment". In order for inks to go through the incredibly fine nozzles of the digital print heads, they must be thinned to a very low viscosity. The average viscosity for digital inks is in the 5–15 centipoise range. Think of water at 1 centipoise, and white plastisol as high as 200,000 centipoise. Because the ink is jetted at such a low viscosity, it immediately soaks into fabric; this makes it impossible to achieve opacity on a dark background since the pigment needs to be on the surface to block the colour of the garment, and produce an opaque image. In conventional DTG printing this is remedied by pre-treating the dark garments with a solution that causes the digital white ink to 'crash' or gel before it can soak into the shirt – think of this action as a chemical flash-cure unit.

Since the hybrid system utilises screen-printing for the white under-print, there is no need for pre-treatment. The white screen ink bonds to the shirt, and the digital CMYK inks bond to the white screen ink. Pre-treat issue solved!



Digital/screen hybrid print system workflow

Ability to add specialty and custom inks.
Since both screen-printing, and digital printing are employed in the hybrid process, certain types of inks and embellishments that simply cannot be deposited via inkjet technology can be added via additional screen(s). This would include puff, glitter, metallic, and even spot colours that are not achievable within the CMYK gamut. An example might be if a design required a specific PMS colour that would be considered non-reproducible within the CMYK colour model; a separate screen with a custom match ink colour could be added to render the PMS colour perfectly.

THE NEED FOR SPEED

Like all digital printing, hybrid textile printing technology is constantly evolving. Early models produced good prints, but at a speed that did not fit any logical business model. These printers were scanning printers. Think of your home desktop printer: to print even a basic letter, the printhead must scan back and forth, and back and forth on the X-axis to create the image.

All scanning printers are slow, just different levels of slow. These early hybrids often took between 60 and 120 seconds to produce an image. To take a traditional automatic press that could print 500, 600, or even 600 units per hour, and then add an expensive hybrid that choked production back to 30 units per hour, was, in my thoughts, the equivalent of purchasing a new Ferrari, and putting a 20mph limiter on it – less than well thought out. The only reason to purchase this system was because you wanted one, and could, not because it was a good business decision.

New hybrid systems introduced in recent months need either little or no X-axis scanning. These printers use larger arrays of printheads to produce a print bar of up to 17". One or two passes of the print bar can produce a full image on most shirts. These hybrid arrays can print a full size image in as little as five seconds. Now these systems create a business model that makes sense. Your Ferrari is back up to racing speed producing 400–600 prints an hour, at a commercially acceptable price point.

WHERE DOES HYBRID FIT?

With its ability to produce at closer to production speeds, hybrid textile printing fills a gap between low run, high cost DTG printing, and heavily cost front loaded traditional screen printing. Hybrid is not a replacement for screen-printing, but an additional weapon in your garment embellishment arsenal.

SUMMARY: HYBRID TEXTILE PRINTING FEATURES AND BENEFITS

- Fast time to press
- Unlimited image colours/short to medium runs
- Prints on virtually any substrate
- Eliminates need for pre-treatment
- Much lower per-unit material cost than DTG
- Minimal art/pre-press preparation
- Ability to add specialty inks and colours to digital prints
- Naturally 'green' system ■

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M&R Digital Squeegee is a registered trademark

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SOFT SKILLS

Martin Bailey stresses the importance of making the right software choices at the right time

We all know that every bit of an inkjet press is vital and interdependent. We know too that it's easy to underestimate the length of time it takes to develop a press to the point that it can ship. It's very tempting to focus on the physical components first without considering the impact that making the right software choices early on can have in the overall solution. Your software is as critical a component as the printhead, media, ink, fluid control, substrate movement and electronics and so needs to be considered in parallel to the development of the physical press.

Here's how powerful software can be. We've been working with more than a dozen inkjet press vendors who have struggled to get the quality they need from their presses and have exhausted what can be achieved mechanically without making the press unaffordable. Applying the right software solution has fixed the problem, quickly and cost-effectively.

Of course, there's a balance to be struck between quality and speed. With the right software driving your press it doesn't need to be a compromise. Let's look at quality first.

The faster the press runs the harder it is to control drop placement precisely. How can software correct for this and for defects in scanning applications too?

Our work with multiple inkjet press manufacturers has proven that software can compensate for:

- Mottling and streaking
- Head to head or nozzle to nozzle variation
- Over-inking

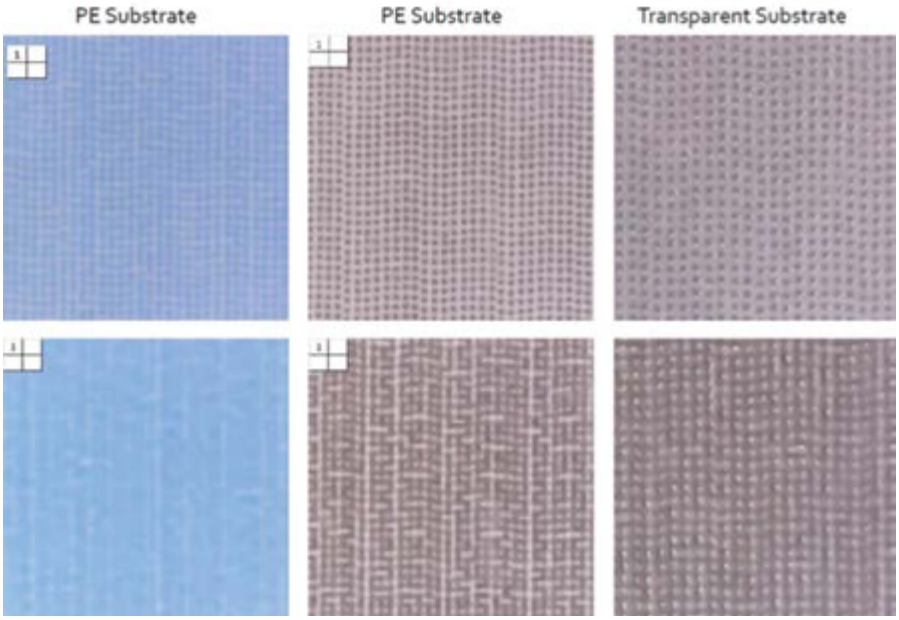
Take high speed inkjet drop placement. Ink drops should ideally form a regular grid on the media but they usually don't.

MOTTLING AND STREAKING

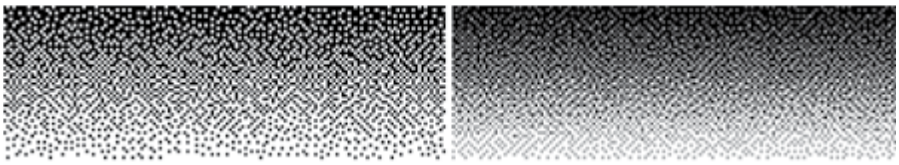
Irregular drop positioning leads to drops 'randomly' coalescing on the media. These microscopic effects cause visible artefacts often described as mottling or streaking. These artefacts can be corrected in a digital halftone screen, or multi-level screen. There are two distinct clusters of behaviour:

1. **Fairly absorbent/ or wettable substrates**
   Drops coalesce on the substrate surface causing visible streaking especially in mid and three-quarter tones. There is also some influence from head geometry and head stitching.

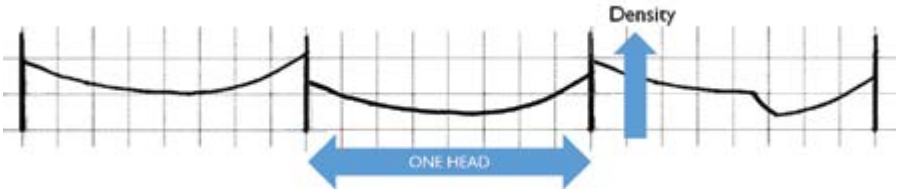
2. **Non-absorbent, poorly wettable substrates**
   Prints are characterised by a mottle effect that looks a bit like orange peel, triggered by ink shrinkage during cure or drying, especially in areas with reasonably high total area coverage.



Examples of chaining, clustering and mottling



Inkjet screening. Left: 1 bit per pixel (1 drop size). Right: multi-level screening (three drop sizes)



PrintFlat reduces non-uniformity, commonly known as the inkjet smile

This discovery led us to introduce two new Advanced Inkjet Screens that are applied in a workflow by our ScreenPro screening engine. Advanced Inkjet Screens are effective with all the major inkjet printheads and combinations of electronics. They work at any device resolution with any ink technology.

Why does a halftone in software work so well? Halftones create an optical illusion depending on how you place the dots and halftoning controls precisely where you place them. Streaking or graining on both wettable and non-absorbent substrates can be corrected.

HEAD TO HEAD VARIATION

Non-uniformity is caused by variations within a head, commonly a smile shape, variation between heads and head wear. It is much more effective to address these problems in software than to expect to tweak voltages which can trigger other artefacts, such as streaking and mottling! In software it's possible to achieve very fine granularity because you can address every nozzle separately on any head and electronics. The improvement is almost instant once output is measured, and jetting stability and head lifetime are not affected. We call this technology PrintFlat and it is also applied by the ScreenPro screening engine.

OVER-INKING

Using too much ink has many disadvantages, not least making curing slower and more expensive and increasing the risk of inks mixing on the substrate surface making barcodes and small text difficult to read. This too can be corrected in software using halftoning, and done in such a way that the press vendor can protect their customers from accidentally over-inking while making or using their own colour profiles for new substrates.

SPEED

If it's going to take you a few years to get to market, it's very important to design for the future. Have you designed the Digital Front End, the 'brain' that will control the press, for the data rates that your customers will need in the future? Our experience is that every vendor is looking to print at higher resolution, using more inks, on a wider press and moving the substrate faster. At the same time more and more printing companies are seeing the value of higher margins for novel uses of variability in the prints. All of those increase the data rate required through the DFE. You don't want to delay your first press, but equally, you won't want to have to completely re-engineer your DFE to drive your second!

RIPs and screening engines need to process image data fast enough to avoid delays in transmitting the data to the press which will halt production. Use multiple engines for parallel processing of halftone screens which can give blistering speeds, especially with dedicated ScreenPro engines sending print data at press speed directly to the drive electronics driving individual print bars for each colour.

To read more download the white paper 'Halftone screen optimization for single-pass inkjets' from the resources page of www.globalgraphics.com/global-graphics-software ■

PrintFlat is a registered trademark of Global Graphics Software

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PROTECTING PATIENTS

Mathias Theiler reports on the pioneering use of digital printing with low-migration ink on PP film for IV bags

When printing packaging for the pharmaceutical and medical sectors, patient safety is paramount. Thus, low-migration inks play a crucial role. As part of a client project, Hapa worked intensively on the complex processes for the digital printing of polypropylene (PP) film with low-migration ink for IV bags.

The challenges of the project for an international company in the healthcare sector involved not only the development of low-migration UV LED ink. It was also necessary to develop a sustainable process for an industrial application that relied completely on digital direct printing. The switch from an existing industrial process to an entirely new one is a huge step that requires a great deal of patience and expertise. Mathias Theiler, Ink Department Manager, provides expert insight into the exciting project.

Low-migration, fully cured inks provide the highest level of safety for patients.

GREATER FLEXIBILITY AND LOWER COST WITH DIGITAL PRINTING

Previously, the client labelled its IV bags using labels and thermal transfer printing. "Both processes require additional consumables, namely labels and heat transfer films, of which 80 to 90% remain as waste," explained Theiler. "Furthermore, due to their adhesive layer, labels constitute an additional migration risk."

During digital direct printing, on the other hand, the materials consumed are limited to the film and the ink. In addition, because of the growing variety of options – with up to 16 different colour markings – the flexibility of digital printing convinced the company to switch to a fully digital process.

GUARANTEEING PATIENT SAFETY

As is mandatory in the pharmaceutical and medical industry, patient safety is paramount in this case as well. "Specifically, this means that at all times, it must be ensured that no limit value exceeding quantities of substances from the ink and the IV bag enter its content, i.e. migrate into it," said Theiler.

Migration may result in substances entering the human body which could be unhealthy for the patient. What is relevant for the definition of migration limits is the scientifically determined quantity of foreign substances which the human body is able to break down and tolerate. In order to be able to correctly evaluate interactions between the IV fluid, packaging, and ink, it is necessary to possess comprehensive knowledge of the ingredients of these components.

Comprehensive analyses and tests in Hapa Ink's in-house laboratory.

A SUSTAINABLE AND SAFE PROCESS

"Considering that the client's new system will be designed for a service life of 20–25 years, the printing solution must function over a very long period of time and therefore be perfectly mature," emphasised Theiler. "This requires a meticulous development and testing process in which we have considered all parameters for safe and reliable production."

These parameters are:

- Substrate
- Pre-treatment of substrate
- Dispersion and ink

Theiler Mathias is Manager of the Ink Department at Hapa

MATHIAS THEILER INK DEPARTMENT MANAGER

Starting out as an electronic engineer, Mathias Theiler joined Hapa in 1980, where he served as R&D Director for 13 years. In 2014, he was involved in the acquisition of an industrial ink organisation to form the Hapa Ink department. During his years at Hapa, Theiler acquired extensive experience in UV DOD inkjet printing design and application, experience that helps him support customers in his role as the manager of Hapa's Ink Department.

Theiler made a name for himself as a pioneering speaker at the inkjet conference TheIJC, which takes place in Germany and in the USA every six months, and is aimed at inkjet specialists.

Join him at TheIJC in Düsseldorf, Germany 15–17 October, 2018. www.theijc.com

- Printing process
- Post-processing (polymerisation)
- Extraction test (worse case test)
- Evaluation
- Migration test

The substrate, the PP film, had already been tested by the client and proven its suitability. "The fact that the film continues to remain an important influencing factor may not be apparent from the very beginning," Theiler points out. "However, it is extremely important that the material to be printed on is always available with a constant level of quality, and that it does not exhibit any fluctuations with regard to its properties, such as material thickness and density, as well as surface tension."

The first step was to determine the correct pre-treatment of the film to establish a solid basis for the adhesion and scratch-proofing of the ink. "During our tests with various pre-treatment methods, the cold plasma process was identified as the best solution," said Theiler.

In the next phase, Hapa created a custom dispersion for the ink. "A stable dispersion makes or breaks the long-term quality of an ink," noted Theiler. "During the ink development, we analysed each individual application carefully while considering the polymerisation kinetics and the degree of curing. Based on this, we tailored the dynamic behavior of viscosity, surface tension, flow properties, adhesion, and opacity of the ink exactly to the client's printing process.

"We also paid particular attention to the printheads by optimising what is called the jetability, which ensures the precise placement of the ink drops," added Theiler, describing the development process.

One other major influencing factor is the polymerisation, which refers to the curing of the ink. This is because only fully cured inks provide the greatest degree of safety against migration; this also applies to low-migration inks.

"We selected a polymerisation with UV LED units, whereby the factors of performance and time played a decisive role," said Theiler. "Thus, the question was: How much UV output is necessary and how long must the printed substrate remain in the curing unit when passing through it in order to achieve the chemical reaction for adequate curing of the ink?"

PASSING THE EXTRACTION TEST

After satisfactory curing results were achieved, the project was ready for the extraction test. "It is also called the 'worst case test', because it investigates whether, in a worst case scenario, harmful substances which exceed the limits which the body is able to break down could migrate out of the ink," explained Theiler.

This stringent test is performed by an independent, certified institute and concludes with an evaluation. If it is within range, such that the ink is able to pass an elaborate migration test, the 'gold standard' of all tests, a huge milestone will have been reached on the path towards the successful conclusion of the entire project.

"The time spent on development and testing was definitely worth it," confirmed Theiler. "We have instituted a sustainably functioning overall process including ink for the digital printing of PP film for IV bags, and are currently in the migration test phase together with the client", he concluded proudly.

The entire development process took place in Hapa's in-house laboratory; the extraction and migration test were performed with external partner institutes. ■

Mathias Theiler is Ink Department Manager at Hapa

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HITTING THE GROUND RUNNING

Jeff Stadelman shares four important tips for creating successful floor graphics

From concrete to asphalt, wood, tile, and more, advertising on indoor and outdoor floors has become one of the most creative and successful strategies for brand owners to reach target markets. Durable, long-lasting and eye-catching, today's floor graphics come in every size, shape and colour and are being used to transform spaces, deliver memorable messages, build brand awareness, and influence consumer purchases. Whether you're new to the floor graphics game or a seasoned veteran, the following tips can help you make the most of your next floor graphic project.

1. KNOW YOUR MEDIA OPTIONS

Typically, floor graphics consist of a base media, overlaminate, and adhesive – although, with recent technological advancements, some pressure-sensitive adhesive (PSA) manufacturers are producing highly successful outdoor floor graphic products that can be used without an overlaminate.

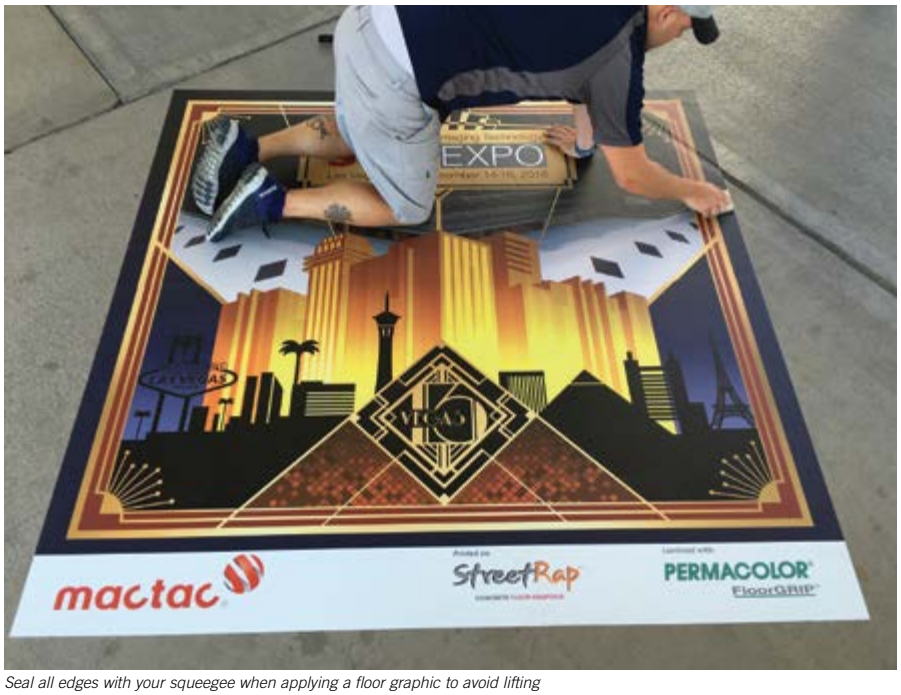
One of the most popular media choices for both indoor and outdoor floor graphics is pressure-sensitive vinyl. Among other benefits, PS vinyl delivers high stability and durability, with a built-in adhesive that offers ease of installation. It's also compatible with nearly every print technology, fairly simple to apply, and known for attributes like visual appeal, image protection, and slip-resistance.

Non-pressure sensitive materials can also be used for creating floor graphics, but they require the addition of a mounting film during lamination. And, while sometimes used, traditional paper is not generally recommended for floor graphics. Even with a protective overlaminate, traditional paper is vulnerable to moisture and offers little resistance to outside elements. One exception; however, is film-coated papers. These can be a good option for photographic images as long as the edges of the print are completely sealed.

Designed without the need for an overlaminate, StreetTRAX (STX1528P) from Mactac is a 13.5-mil print-and-apply PVC film that is top-coated with a non-skid printable clear aggregate. Created for outdoor floor graphics, it is inherently slip resistant and ideal for high pedestrian traffic areas. It has an outdoor application life of up to two months and is printable with solvent, eco-solvent, latex and UV-cured inkjet printers.

2. CONSIDER THE APPLICATION SURFACE

When first introduced, floor graphics were primarily used on smooth, non-porous flooring materials like tile, hardwood or other sealed application surfaces. However, today, in addition to traditional smooth surfaces, floor graphics are also appearing on numerous rough and textured surfaces, like industrial carpet, concrete and asphalt.



Seal all edges with your squeegee when applying a floor graphic to avoid lifting

StreetTRAX's slip resistance is an asset at marathons and races, parades, fairs, college campuses, sports arenas and entertainment venues and convention centres

With a growing number of floor graphic products on the market today, it's important to partner with a floor graphics supplier to choose a material that will successfully meet the needs of the specific application surface.

For example, when applying floor graphics to tile, a supplier will likely recommend a media that features a removable adhesive. When applying floor graphics to unsealed concrete or asphalt, an ultra-aggressive media that can withstand harsh weather and heavy foot traffic is ideal. And, if the graphic is going on industrial carpet, a cohesively aggressive media offers peace of mind that when it's time for removal, the adhesive will remove with the graphic and won't stain the carpet.

3. SET YOURSELF UP FOR AN EASY INSTALLATION

Once you have your chosen media and have printed your graphic, there are several things you can do to achieve a seamless installation. First, allow plenty of time for the ink to dry – either before laminating or before applying graphics that don't have overlaminates. A good rule of thumb when printing with solvent, eco-solvent or latex inks is 24 hours of dry time.

If laminating, cold roll lamination is

Floor graphics are perfect attention grabbers at any event, especially trade shows

Using heat around the sides and edges of your graphic will help seal the print

Indoor installation graphics in round shapes are less likely to get caught on cleaning equipment like mops or rotary scrubbers

optimal as this process will help ensure the integrity of slip-resistant textures. Using overlaminates provides protection against scuffing, abrasion, moisture, and UV light. This important protective layer will seal the graphic, making it suitable for heavy foot traffic.

Second, properly clean the flooring surface. A clean floor is critical to a graphic's success. Most indoor surfaces can be adequately cleaned with detergent and water or a commercial cleaner, then washed with isopropyl alcohol to remove any grease or residual cleaner solution (if there is wax on the floor surface, it doesn't need to be removed). With most outdoor applications, you can simply sweep or brush away debris to clean the surface. In the case of both indoor and outdoor graphics, always make sure the application surface is completely dry before you begin application.

And, finally, use the hinge method to apply your graphics. It's one of the best application methods for floor graphics because it allows proper graphic alignment and deters movement during application. For outdoor floor graphics, consider taping down each individually hinged graphic to avoid unwanted movement from potential wind.

Other things to keep in mind when applying floor graphics:

- Don't overlap layers (multiple layers can result in a tripping hazard).
- Round all corners of the graphic – especially for indoor installations (sharp corners can get caught on cleaning equipment like mops or rotary scrubbers).
- Seal the edges of your print to avoid lifting.
- Allow 8–12 hours of set time after installation to further build the adhesive bond.

4. SLIP RESISTANCE/HIGH TRACTION REQUIREMENTS

Pedestrian safety is, of course, imperative when applying graphics to floors. To ensure floor graphics are safe, finished graphics must meet outlined requirements for slip resistance/high traction per the American National Standards Institute (ANSI) and National Floor Safety Institute's (NFSI) B101.3 specification.

Under B101.3, slip-resistance is determined by evaluating levels of traction as high, moderate and low through laboratory or field-testing that measures the wet dynamic coefficient of friction (DCOF) or wet static coefficient of friction (SCOF). Meeting the requirements of the specification is not only needed for outdoor wet applications, but also indoor applications where a graphic may be exposed to wet cleaning, such as mopping, or at at the entrance of a retail store during wet weather.

And, failure to meet the specification can have hefty consequences. In addition to people getting hurt, there are litigation implications to consider, insurance-related implications to consider, and implications from the US Department of Labor Occupational Safety and Health Administration (OSHA) to consider.

FloorGrip PF6600 is a textured 6.0-mil clear matte specially coated vinyl overlaminate that offers superior pedestrian traction and is the only overlaminate on the market that meets ANSI/NFSI's newest specification.

SUCCESSFUL AND IMPACTFUL

Once you've done your due diligence and have mastered the technical details of creating a successful floor graphic, you will be well on your way to becoming a floor graphics expert. However, one last thing to keep in mind is creativity in messaging is key. Customised shapes, bold colours and short copy tend to lead to greater success. Unique visual effects like 2D and 3D imagery are known attention-getters. And, it's best to stay away from white space and other light colours, as they tend to highlight dirt and scuff marks. ■

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CONNECTING THE DOTS

ESMA Expert, Roland Biemans discusses challenging the complexity in print production

Roland Biemans, founder of ESMA technology partner LMNS

New printhead technologies, ink formulations and software solutions are paving the way to seriously benefiting from improved quality and possibilities. However, dubious marketing spin and the drive to over-simplify configuration requirements and production limitations tend to overshadow sound advice and practical implementations. Moreover, many production processes are governed by speed of throughput with these rates being the principal criteria for running an efficient business. Manufacturers of machines are quick to promote these running speeds as a direct line to profit but, in truth, the numbers of square metres/hour which can be generated only represent one element of an overall cost-effective operation.

SPEED

Even though great progress in understanding has been made over the last few years, there is still a huge gap between what is expected and what is possible. From a practical point of view, production speed has to fit into a company's overall working operation where individual machines are in use for different parts of the process. This also takes into account logistics, manageability and, of course, the number of operators on the print-shop floor. It is not only the maximum amount of printed media in an hour that counts, although many print shop owners and printer manufacturers alike focus on this single parameter; it is more to do with the total throughput as an end product.

Speed of a machine's output does not necessarily lead to overall efficiency. The most important thing about running a print shop profitably is setting up the workflow properly. Although this may seem an obvious thing to do, the numbers of companies missing out on making the most of their production is vast. In some cases, this is understandable because the print shop owner literally grew over time into the situation of having different types of equipment. His only solution was to invest in incompatible systems to get a specific job done. However, many businesses and their owners also just accepted the production set-up, simply because there was no trigger to optimise its facility and its work-flow, and to generate greater efficiency.

With more companies focusing on digital printing, there is growth in the availability of new products, services and opportunities. The downside is the often-heard complaints about insufficient proper advice and lack of expertise. This criticism applies to manufacturers and suppliers, as well as to print service providers. As a result, many end-users are not provided with solutions they are looking for and print-shops find that they need to make additional investments to hold up to the promises being made.

Accurate colour reproduction is more than measuring patches

WASTE

Print shop owners who take a step back to look at their production facility may gain shocking insights when they discover that 20% of their output is thrown out because of production failure. A quick assessment shows that some machines or operators are standing still and idly waiting for another process to finish before they can run the next step in the production flow. Additionally, because of incompatible systems, considerable amounts of time are wasted on converting or changing media, rolls or processes.

Another common problem concerns the colour reproduction and matching across systems. An issue often mentioned is the inability to catch mistakes before they happen. Operators that have grown to accept a certain system or method might get stuck with what they are accustomed to, and never research new or better options which can lead to greater efficiency and improved work-flow overall.

Logically, running different types of machinery will cause variations in output. Different inks produce a different colour gamut, and different media will have had different treatments. Different print processes feature different resolutions and ink droplet shapes and sizes. Some inherent differences cannot be circumvented but, in pursuing optimisation, it is certainly possible to greatly improve end results.

This poses an interesting question – is print speed still the most important factor when valuing the overall production process? The obvious answer is – workflow efficiency does not come from print speed alone.

Because of a tougher economy, greater competition and with the rise of converging markets, it is becoming increasingly apparent that an optimised work-flow can be exactly the key element that keeps a company afloat. Better still, this efficiency can enable companies to grow their businesses with greatly improved margins.

IDEAL ENVIRONMENT

In an ideal world, a truly efficient and reliable work-flow needs to be based on compatible elements which, together, provide seamless

HOW ESMA AND LMNS CONNECT THE DOTS

It is not an easy task to filter the marketing stories from the realistic production figures. There is no global forum or on-line portal with product reviews and comparison sheets. Well-known manufacturers might not have the right product but produce convincing marketing 'spin', while lesser known manufacturers could have the perfect product but do not have the right exposure. Furthermore, resellers may offer products from different suppliers that may or may not be entirely compatible.

ESMA is working with its members and technology partners to answer questions about the best practices in digital print production by combining the expertise of many involved. Part of its motto has always been to improve training and knowledge via technical articles and seminars and to stimulate worldwide exchange of technical information.

One example of how complexities in print production can be countered is the approach of ESMA technology partner LMNS, an expert initiative that combines the know-how of its network of specialists that have a track record in the areas of visual communication, sales and marketing, printer development, ink formulation, textile, packaging, software, colour management and many other disciplines related to traditional analogue screen printing, digital ink-jet printing and print work-flow processes.

Both serve the same industry with a similar attitude – connecting the dots in order to catch problems before one dot is printed.

production in a harmonious environment. There would be no nasty surprises likely to spring up from any part of the processing procedure, from file generation, colour management, printing and finishing.

Often, in a single print shop, many manufacturers and suppliers will have delivered equipment with their own methodology and their own ideas on how to approach a production flow. Where one supplier suggests optimising their specific machine in a certain way to get better results, this can result in adverse effects along the way with other processes. While one production method may work well, in another it may cause a lesser quality or, worse, slow down overall production.

Where one manufacturer's RIP software will be perfect to run a specific machine, in a combined environment of different printers it can cause operators to lose time or find themselves struggling with unwanted misprints. Likewise, where one supplier may claim it sells media fit for any purpose, this can actually result in worse output than would be possible had a better media from another supplier been used.

For the majority of inkjet technologies in use today, each element is independent from the next so that the printing machines and finishing stations are not related because they are manufactured by different specialists. Even where one manufacturer provides a bundle or combination, it is often based on equipment coming from different places. This means slightly different machine width and different media handling, a different approach to optimising speeds or developing interfaces and no relation between what happens at the beginning of the process and what can influence it at the end. It does not mean that any single component is bad in itself but, combined, makes it less efficient.

Good work flow also involves generating efficient practices across all production areas. Many of these might appear to be based on common sense but this approach normally only becomes apparent if there is an awareness of all the processes involved in daily working, from start to finish.

CONCLUSION

The value of an efficient work-flow is based on overall throughput, and not merely that of the printing machine speed – after all, its role is only one part of the entire process. System efficiency and ergonomics also play a vital part in the economics and logistics of running an effective production line. True compatibility between software, printing, post-processing and finishing ensures that an operation flows smoothly and economically. This type of set-up, where each unit represents a sum of the total system, means that operators can add to the overall productivity by planning each job within given parameters, knowing that their workflow is tailored to the solutions being used and the people who are using them, and without unwanted or unexpected interference or disruption. ■

Roland Biemans is the founder of LMNS

ESMA
Driving Print Excellence

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SHARING IS CARING

Bruce Ridge interviews international screen printing consultant Bill Hood

Bill Hood has written over 75 books and is the founder of Solutions Journal Magazine *and the School of Screenprinting*

Conducted in May 2018 by Bruce Ridge, this interview with Bill Hood is the latest in a series of articles intended to provide insight to the future of our industry from the perspective of members of Academy of Screen and Digital Printing Technologies. Bill's career covers almost 70 years of experience as both a graphic and textile screen printer, consultant, artist, inventor, author of thousands of articles, over 75 books, founder of Solutions Journal Magazine and the School of Screenprinting, among other business ventures. Bill currently lives in Cuernavaca, Mexico.

BR: How is life in Mexico?
BH: Living in Mexico provides me with peace, serenity, and tranquillity. After having visited Mexico, on family vacations as a child, I finally made a move here in 2005. While I initially decided to live in Mexico for the culture, there was also the fact that I had more clients in Mexico, as they value knowledge more than they do in many countries. Living in Mexico provides me an affordable and carefree lifestyle at about one-tenth of what it would cost to live the same lifestyle in say, Austin, Texas. I am a workaholic and want to spend more time on writing to give back to the screen printing technologies. Here, I have a gardener and a housekeeper, which allows me more time to concentrate on my work. While I do cook, I prefer to eat in restaurants, and last year I opened a restaurant around the corner from my house, so I would not have to go far to have my meals prepared so that I can get back to work more quickly.

BR: Are you still a United States citizen?
BH: Yes, however, I am a resident of Mexico and other than voting, I receive the same benefits as Mexican citizens. There are currently over 1.5 million USA citizens living and working in Mexico full time, and more are arriving daily. Add to that another three million from other countries, and we have a large ex-pat community here. Retirees find Mexico a retirement haven as the cost of living allows them a superior lifestyle than they could live in the USA. In fact, six retired screen printers live in Cuernavaca, so I always have someone with whom to talk shop.

BR: You have an amazing career, tell me about how you got started in screen printing?
BH: My dad started a screen printing business in the 1940s, and I worked with him when I was a child. He printed signage and posters. I worked with him until I entered the military in 1961 where I served in Vietnam. When I returned to the USA, I started my own screen printing business while attending university concentrating on printmaking and fine art. I was especially interested in the technical aspects of screen printing, as a way of improving my knowledge, which led to technical writing. My father once told me that, *"No matter how much knowledge one has, it means nothing if you don't share it with others."* For that reason, I began consulting, working with well over 8,000 screen printers in 62 countries, which provides a source of inspiration for my articles and books.

BR: How do you go about writing so many article and books?
BH: I rise at 04:30 each morning, and after making the first of many cups of coffee, I begin writing. I imagine that I have five guest screen printers with different backgrounds and levels of intelligence on the subject with me. My guests and I have conversations about the technical content of my writing. This gives me insight into how other people will be perceiving the information I am trying to communicate. My experience is that if I answer the questions that people want to ask, they will get something out of the book. I write for all segments of the screen printing technologies. I am most proud of my book, 'The Golden Image Ratio of Image to Screen Size,' for which I received a Best in Class Award and the Swormstedt Award in 2016.

BR: Tell me how often you write articles and how long do they take?
BH: I write about things I know. So it does not

take me that much time to write an article. I write at least one article every day. My friend, W. Bruce Cameron, an extremely prolific writer, told me said he gets up at 4:30am and starts writing. Nobody is up, and there are no interruptions. He gets a full day's writing done by 8am. Following that advice, I also write early in the morning, when my mind is fresh. I write only about things that I know intimately, and in a free flow manner, which allows me to finish an article in perhaps 30 minutes. I used to write for most of the trade publications, but now I primarily write for my online magazine, *Solutions Journal Magazine*.

BR: Do you have a collection of serigraphs on the walls of your home?
BH: I do have some serigraphs on my walls. I have several serigraphs that my close friend and fellow Academy member Nancy Grey did when she was in university. I have one of her original watercolours, as well. She is a great artist. And, I have some serigraphs by local artists. My minor at university was in fine arts, and I still paint when I find the time. I have seven or eight paintings in the works right now in my studio. And, I have a graphics press in the studio that I will use to make serigraphs when I eventually retire.

BR: You founded the Austin Arts Bulletin Board Service which was an early version of what we now know as printing forums. How did that originate?
BH: In 1973, I started a service bureau in Austin for doing high-end film work for screen printers. Printers would send us their files electronically through the phone lines and after printing the files to our imagesetter, we would overnight the films back. I began posting technical articles on screen printing and was amazed that in a month we were getting messages from around the world. People were starved for technical information. This made me realise the need for technical information on screen printing. We were eventually able to post audio messages which predated what we know today as podcasts. This was four years before Bill Windsor started publishing *Impressions* magazine.

BR: Do you participate in printing forums or bulletin boards today?
BH: I do watch and monitor several printing forums. However, I have become increasingly disappointed with forums in general because of the inability of most to communicate properly. I am amazed at how often someone will post a question where they do not give enough information in the first place for someone to respond accurately. Then several people will respond with little more than guesses as to a proper solution. However, the person asking the question never responds back. Other forum participants never know what worked and what didn't. I tend to respond to questions in a comprehensive (lengthy) manner to give insight into what is needed to solve the problem. That does not sit well with the 280-character Twitter fans. I have a forum for my clients and friends who are interested in learning and growing their knowledge base.

BR: The first Academy interview I did was with Rich Hoffman. He said he monitors printing forums all the time to learn what his customers are doing and saying about his products. Quite often he calls the person with the question to resolve the problem.
BH: Rich is a unique individual. He gives out his cell phone number on forums, and he answers the calls. He wants to help people and in doing so creates a lot of credibility for M&R. As with most consultants, I take a similar stance in readily giving access to others. I receive up to 300 emails a day from screen printers seeking to resolve their problems and gladly paying for the knowledge. I devote several hours a day to responding, and many become long-term clients, often with virtual mentoring.

BR: When you go to a trade show, do you ever attend seminars?
BH: I used to back when there were 150 people in each room, and the presenters were among the best in the screen printing technologies. At one time, I did seminars for the trade shows, which

Continued over

were well attended. Today, the trade shows have promoted seminars toward start-ups or product marketing, so that there are often only twenty or thirty people in attendance. Most seminars are no longer about innovation and growth, and there is little to become excited about.

BR: Do you have an interest in inkjet printing technology?
BH: Yes, I read as much as possible on innovation in the print world. I am in full support of innovation and encourage those in the screen printing technologies to embrace other technologies to meet the demands of their clients and grow their business. Since inkjet requires far less labour than screen printing, it will continue to grow for short runs on flat substrates. However, it will prove to be difficult to match the versatility of screen printing, which has allowed the process to thrive, even when faced with competition from other processes. We should not forget where we came from. The screen printing process originated circa 1852 (not as much of the misinformation on the internet states) and competed against letterpress as a way of producing signage, which eventually all but disappeared as a commercial printing method. Screen printing remains its hold on printing with a wider range of inks and coatings, substrate types and shapes. This is particularly true of the industrial printing segment.

BR: The other day I spoke to a printer who indicated that their four-year-old grand-format UV inkjet printer had no resale value. Do you think this puts new pressure on a printer to make money faster?
BH: The short answer is yes, as the goal should always be never to sit idle, but to make as much money as possible during each of the 24 hours we are given per day. If he bought the equipment and didn't earn the revenue needed to replace the machine after one year, the owner is responsible for his losses. He obviously was not considering the return-on-investment (ROI) or pay back period (PBP). In the USA, under Section 179 Deductions, a business owner can immediately deduct the cost of equipment, up to $1 million. All one needs to do is take the leap and work intelligently to earn as much money from the investment as possible in the shortest amount of time. That means not closing at 5pm and sitting idle for 16-hours of the day not earning revenue. It also means that the printer should have planned on selling the grand-format UV inkjet printer before the resale value dwindled, and invested in more equipment to fund his growth.

With proper education on ROI and PBP, screen printers would see the value of buying automatic equipment as compared to manual equipment. When I bought my first automatic press from M&R, I made enough money in the first month to pay for the press. Equipment manufacturers, such as Rich Hoffman should be educating their clients on the ROI and PBP of buying automatic printing presses.

BR: What do you have planned for the next couple of years?
BH: I plan to keep writing. My current focus is on online education. Mainly, I concentrate on identifying areas where there is a waste and bring that to the attention of others, so that they can grow. Another project is to create a better understanding of screen making and the ink transfer process, which is misunderstood by the majority of screen printers, creating far too much waste.

BR: What was the last good article you read?
BH: The latest good read would have been the book *'How to be a Great Screen Printer'*, edited by Steven Abbott, as was Elmar Messerschmitt's *'The Ultimate Screen for Close Tolerance Screen Printing'* article. I also like Hans-Gerd Scheer's, *'Influence of the Stencil Fabric on the Thickness of Ink Deposit and Consumption of Ink'*, and Don Marsden's article, *'Stencil Selection – More than a Direct Approach'*. I owe the great writers that came before me my gratitude for influencing me to be better each day.

BR: Academy membership has primarily been an acknowledgment of the work done by individuals that have given back to the specialty printing industry committing time to educate and communicate for the betterment of the industry. You are an overachiever in this area. Thank you for your contributions. ■

The Academy of Screen and Digital Printing Technologies (ASDPT) is composed of professionals that have dedicated a large part of their career to the education, development and innovation to the industry. This interview was conducted by Bruce Ridge, Director of Technical Service, Nazdar Ink Technologies. Bruce has been a member of the Academy of Screen and Digital Technologies since 2004.

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INKJET RELIABILITY, QUALITY AND SPEED – SEE THE PROGRESS AT THEIJC 2018

As inkjet enters a new era, there are three key areas of development: speed, image quality and reliability. Breakthrough findings enabling equipment manufacturers to address these areas are presented at the 5th edition of The Inkjet Conference, 16–17 October 2018 in Düsseldorf.

TheIJC 2018 features 62 presentations on three parallel tracks. World leading authorities explain technologies which find their way into the existing and future printing systems – for all industrial applications.

"After four events in Europe and the successful introduction of TheIJC in the USA earlier this year, we have been observing the constant global growth of inkjet," said conference co-founder Steve Knight from Digital Direct Technologies. "Our community expands as more and more manufacturing processes feel the impact of digital print technology and investigate implementing inkjet into their specific applications."

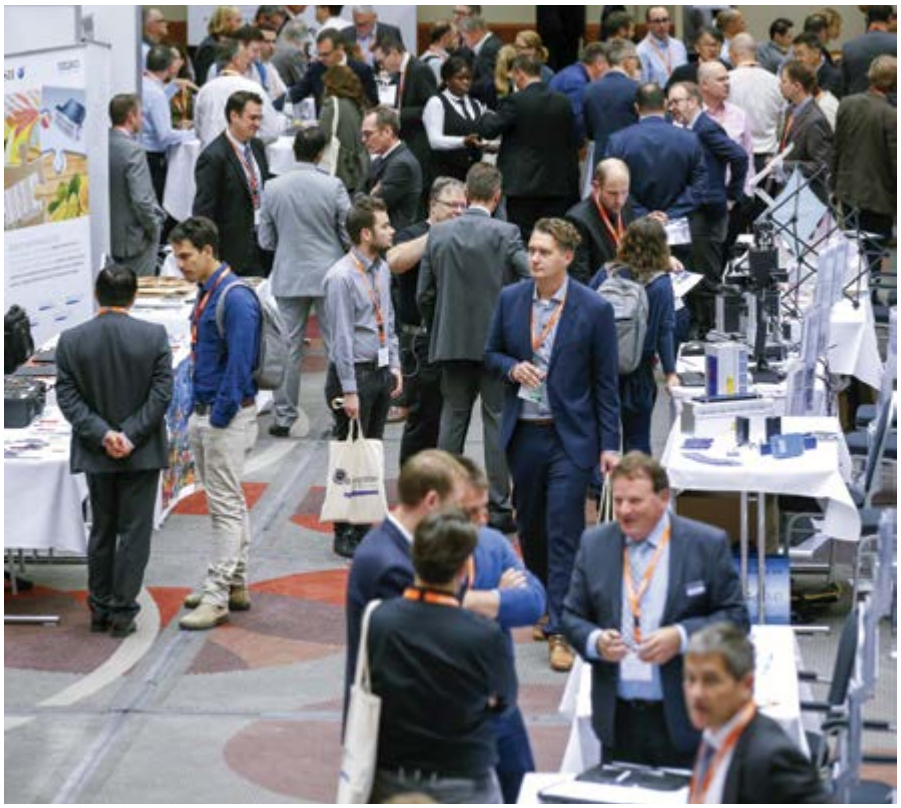
CONFERENCE PROGRAMME

Following the positive feedback from the previous edition, the conference programme opens with plenary sessions with state-of-the art insights from major printhead manufacturers. Afterwards topics from hardware, software, vision systems, ink and curing, innovation and research are presented on three parallel tracks. Titles already confirmed include:

- 'aNIR: Enabler for pre/post inkjet processing' by Dr Kai K.O. Bär, Adphos
- 'Inkjet inks to colour your living space' by Dr Marc Graindourze, Agfa
- 'UV LED surface cure and low migration/ low odour answers for inkjet inks' by Luc De Waele, Allnex
- 'Powerdrop: Making ink stick' by Ben Brebner, Archipelago Technology
- 'Automatic optical inspection and process control based on defect classification' by Stefan Bickert, Baumer Inspection
- 'Adhesion of inkjet inks: pain or gain?' by Dr Yolanda Justo, ChemStream
- 'Inks for ceramic decoration and the full digital goal' by Dr Chiara Molinari, CNR-ISTEC
- '2.5D-3D printing: New trends in digital surface creation with inkjet' by Thomas Kirschner, ColorGATE
- 'Is this the end for spray coating?' by Clayton Sampson, Cyan Tec
- 'Inkjet droplet measurement with laser diagnostics' Dr Hua Wang, Dantec Dynamics
- 'Analysis of the ink and substrate surface properties under inkjet conditions' by Dr Martin Grüßer, Dataphysics
- 'The winning resin technology for inkjet in packaging' by Paul Hönen, DSM
- 'Curing advantages with deep UV LED below 300nm' by Dr Tanja Bizjak-Bayer, Excelitas
- 'Freedom to operate: Digital printing for textiles' by Jane List, Extract Information
- 'Logic-based methodologies for quantitative and qualitative analysis of nozzle jetting and printhead performance' by Shane O'Neill, Fujifilm Dimatix
- 'Key success factors for developing and commercialising a successful aqueous inkjet product' by Dr Hamid M. Shirazi, Fujifilm Inkjet Technology
- 'Handling inks in inkjet systems: Main requirements for liquid pumps' by Markus Orlando, Gardner Denver Thomas
- 'High speed and high quality with variable data: Inkjet's holy grail' by Tom Mooney, Global Graphics Software
- 'Direct to shape printing of complex objects' by Phil Collins, Global Inkjet Systems
- 'Understanding UV LED lifetime' by Dr Matthias Sachsenhauser, Hammamatsu
- 'Key success factors for inkjet integration projects' by Steffen Orth, Hapa
- 'Pharmaceutical inkjet printing – dream or reality?' by Olga Kapelnikova, Heinrich Heine University
- 'Physical analysis of ink-radiation interaction in drying processes' by Dr Larisa von Riewel, Heraeus Noblelight
- 'Mapping printhead jetting possibilities with dynamic ink properties' by

Continued over

Dr Mathieu Soutrenon, iPrint
- 'Designing pumps into ink supply systems' by Andreas Hauri, KNF
- 'First experimental study using a novel device for characterising drop formation, drop substrate interaction, and waveform optimisation' by Dr Thomas Willers, Krüss
- 'Peeling the inkjet onion: Nozzle out detection and compensation' by Jonathan Wilson, Meteor Inkjet
- 'A new combination instrument to monitor pigment size and overgrains' by Dr Thomas Benen, Microtrac
- 'Inkjet printing for functional applications: From lab to fab' by Dr David Stüwe, Notion Systems
- 'How to evaluate your filtration and degassing processes for your digital inkjet ink' by Michael Mehler, Pall
- 'Breakthrough technologies for maximised UV LED output consistency and control' by Dirk Exner, Phoseon
- 'Industrial print system design' by Florian Fässler, Polytype
- 'Filtration and particle size analysis: Why these techniques must be utilised together' by Larry Unger, PSS/Soliton
- 'Inkjet-printed perovskite photovoltaics: From laboratory to industry' by Dr David Forgacs, Saule Technologies
- 'Inkjet printing of edible inks: Challenges for food and pharmaceutical applications' by Dr Simon Daplyn, Sensient
- 'Inkjet inks for labels and packaging' by Matthieu Carni, Siegwerk
- 'Inkjet market update and 5-year forecasts' by Dr Sean Smyth, Smithers Pira
- 'Future strategies for energy curing ink design' by Damian Ward, Sun Chemical
- 'Possibilities of digital printing for exterior and interior architectural applications' by Dr Dieter Holzinger, Tiger Coatings
- 'Latest advances in Silicon MEMS printhead technologies' by Jason Remnant, Xaar



90 tabletops welcome visitors in the networking arena

EXHIBITORS

90 key industry players welcome visitors at their stands in the networking arena, including first-time exhibitors such as Atfex, BASF Personal Care & Nutrition, Ceradrop, Cyan-Tec, DSM Coating Resins, Gardner Denver Thomas, Notion Systems, Saule Technologies, Siegwerk, Tiger Coatings and TriModal.

TheIJC 2018 takes place at the Crowne Plaza Dusseldorf in Neuss, Germany on 16–17 October. The event starts in the afternoon on 15 October with inkjet workshops available for free to all conference delegates. For registration please visit http://theijc.com ■

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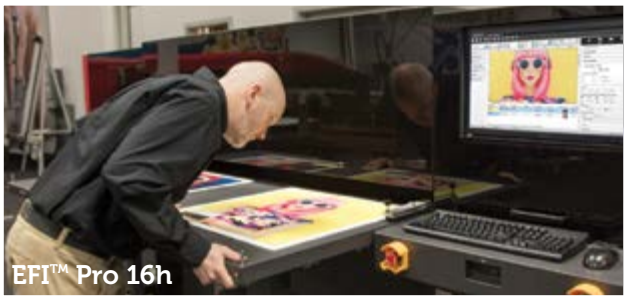

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SCREEN PRINT INDIA 2018 MAKES ITS MARK

The first edition of Screen Print India under the Messe Frankfurt umbrella was held over 20–22 April 2018 at the Bombay Exhibition Centre, Mumbai. The event had strong support from associations such as Asia Screen Printing & Graphic Imaging Association (ASGA) and the Screen Printing & Graphic Imaging Association. Over the three days the trade fair attracted 5,738 professional business visitors and hosted 94 exhibitors, with a number of companies, including J. N Arora, Photokina, Skyscreen and Duratech Automation, confirming that they closed deals on the show floor.

"The screen printing industry is going through a major revolution with majority of the companies adopting digitalisation," stated Raj Manek, Executive Director and Board Member, Messe Frankfurt Asia Holding. "Many manufacturers and suppliers are looking forward to invest in the Indian screen printing market, making Screen Print India an excellent addition to our group of exhibitions. I am happy to say that we have received an enthralling response for the first edition and we are confident that Messe Frankfurt India will take Screen Print India from strength to strength over the coming years," he concluded.

Underlining the emerging trend for eco-friendly products, Screen Print India featured many companies exhibiting ecosolvent inks and other related products. "Looking at the current scenario where many hazardous products are being banned, we feel going eco-friendly is the need of the hour," explained first time exhibitor B. Murali Dharan from Greenways Tech Solutions, while Aakash Sheth, Managing Director, Photokina Chemicals was keen to use the event to showcase his company's new 'hydrographics' water transfer printing. "Screen Print India 2018 has been a great platform for us to showcase this style of printing and we have received an amazing response," Sheth reported.

VISITOR FEEDBACK

Sharing his experience after visiting the show was Ravi Humane, Owner of Commercial Screen Art: "We have been into manual printing for many years now and our main reason to attend Screen Print India 2018 is to understand the current market and adopt new technologies," he explained. "As everyone is moving towards digitalisation, Screen Print India has helped us evaluate the latest trends in the industry."

"Since the time UV technology was introduced into screen printing, it has developed at a very fast pace in India," confirmed Chirag Modi, Proprietor of Creative Stick Art. "Many printing companies are now interested in investing in screen printing indicating that the sector is growing. As far as the show is concerned, it is very well managed by Messe Frankfurt India. The stalls look great and the show is very spacious and organised. I am very happy with the exhibition."

SEMINARS AND AWARDS

The event also offered a series of technical seminars covering topics such as 'Screen Making (All Aspects, All Audiences)', 'Plastisol/Waterbased Ink Curing Parameters for Garment Printing', and 'Digital Printing Technology: Current State of Technologies'. The seminars were conducted by Johnny Shell, Vice President, Technical Services (SGIA, USA) and Charles Arputhaswamy, a screen printing consultant.

Finally, the Screen Print India Awards celebrated print craftsmanship with a glitzy affair where a list of eminent screen printing companies were recognised for their work in the industry. Examples of the prize-winning print were displayed at a dedicated space called the SPI gallery.

Having set a positive tone for future editions, Screen Print India will return in Delhi in 2019. ■

Visitors were a mix of veteran professionals keen to embrace digitalisation and technology enthusiasts looking for the latest machinery.

Further information:
web: www.screenprintindia.com

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Over 500 exhibitors and more than 20,000 registrants are expected to attend

WHAT'S ON THE HORIZON: SGIA EXPO 2018

Registration is open for the 2018 SGIA Expo, which takes place in Las Vegas from 18–20 October

Show owner and producer the Specialty Graphic Imaging Association (SGIA) expects more than 20,000 registrants to attend its 2018 Expo show, which features over 500 exhibitors and will be supplying industry leaders with new ideas, applications and technologies to catapult their businesses to new levels.

As printing evolves, and technologies and markets converge, the SGIA Expo facilitates industry development, giving printers and suppliers a comprehensive look at the state of the industry and what is on the horizon for printing.

"The SGIA Expo attracts printers across a broad range of markets, and this is not by accident. Whether you are in packaging, commercial, garment, graphics or industrial, there are many technologies, ideas and insights to be gained from the resources at the most dynamic show in printing," said Ford Bowers, President & CEO, SGIA.

A 72-session conference programme will complement the Expo floor, giving attendees insights into how they can maximise the latest machinery, applications, consumables and ideas they see on display. ■

The show attracts printers across a broad range of markets

Printers and suppliers can expect a comprehensive look at what is on the horizon for printing

Further information:
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Sun Chemical releases 2017 Sustainability Report

The 2017 Corporate Sustainability Report from Sun Chemical details the work the company is doing to increase its use of bio-derived raw materials in its products and shows positive progress on its eco-efficiency goals.

Highlights from the report focus on the development of eco-friendly solutions, including how:

- solvent-based liquid inks use resins responsibly sourced from certified forests
- water-based liquid inks use bio-derived resins that do not impact ink performance
- printed biosensor technology detects levels of pyruvates in onions to determine pungency
- bio-based food colorants are using spirulina derived from photosynthetic bacterium
- MirrorTech inks reduce waste by replacing metalised board with printable metallic ink

"We want to show our customers that we are continuously working with suppliers and challenging ourselves to improve the eco-efficiency of our processes and products," said Michael Simoni, Global Product Stewardship Leader, Sun Chemical. "Our latest sustainability report shows a variety of exciting ways we're increasing the use of bio-derived raw materials in our products."

The report outlines Sun Chemical's sustainability roadmap which uses a phased approach to improve the eco-efficiency of each production and non-production facilities' processes and products by monitoring key metrics to understand and manage its environmental impact. Its internal key sustainability metrics measure: energy consumption/conservation, energy carbon footprint, process waste reduction, water consumption, material safety and employee safety.

"Our commitment to sustainability drives us to provide our customers with meaningful data that they can use, and in turn help meet their environmental goals," commented Gary Andrzejewski, Corporate Vice President, Environmental Affairs, Sun Chemical.

The Sun Chemical sustainability report is available to customers and can be requested online at www.sunchemical.com/sustainability. ■

Roland DGA offers competitive technology upgrade

Together with financing company Geneva Capital, Roland DGA Corporation has introduced a 'Technology Upgrade Program' for Roland customers throughout the USA. In addition to making it easy to qualify for financing a new Roland device, the service allows customers to upgrade to new models in as little as 12 months.

Other benefits include low monthly payments (OAC), accelerated tax write-offs, short loan terms of three years or less, and the ability to keep purchased equipment under warranty.

"By taking advantage of the new Technology Upgrade Program, Roland DGA customers can maximise their profits, enjoy the extra peace of mind of continuous warranty coverage, and have the option to upgrade their devices frequently to keep up with growing business and production requirements," said Tony Miller, Vice President of Sales and Product Management. ■

Inkcups appoints Asia Sales Manager

Supplier to the pad printing, garment tag printing and specialty inkjet printing industries Inkcups has hired Helen Chan as its new Sales Manager for Asia.

Based in Hong Kong, reporting to Matthew Yates, Global Tagless Director, Chan will manage Inkcups' staff throughout Asia. Her central responsibilities will consist of evolving and preserving sales operating plans for areas that include target accounts, forecast, sales strategies, tactics, and resource requirements. She will also be building, improving, and managing sales channels to maximise business potential in the respective territories.

Prior to joining Inkcups, Chan was employed at Kornit Digital where she worked as a Sales Manager. ■

Strong exhibit sales for InPrint USA 2019

Over a third of exhibit space has already been sold for InPrint USA. The second edition of The International Exhibition of Print Technology for Industrial Manufacturing is scheduled for April 9–11, 2019 at the newly renovated Kentucky International Convention Centre in Louisville.

Exhibitors from around the world will showcase equipment, tools, and services for printing on metal, plastics, foils, textiles, glass, ceramics, woods and other substrates in an individualised and cost-efficient way. The main product categories include:

- Machinery and printing systems
- Print heads, screens and other special parts
- Ink, fluids and chemicals
- Materials and substrates
- Hardware and software solutions
- Pre-press devices
- Equipment for processing and finishing (cutting, pressing, molding, etc.)

"InPrint USA is generating a lot of interest with exhibitors very quickly because the show is highly curated, making it one of the most efficient events around," said Kevin Jackson, Exhibition Manager for InPrint USA. "Attendees find solutions and technology specific for their unique industrial print needs and exhibitors have a tightly segmented audience to buy their products and applications."

InPrint USA will again be co-located with ICE USA, the International Converting Exhibition. More than 3,300 verified registrants attended the co-located shows held in April 2017. ■

Encres Dubuit Group launches Chinese Red

After introducing two fluorescent colours (yellow and magenta) in spot colour last November, Encres Dubuit Group has now added Chinese red – a shade that is particularly difficult to reproduce with a process colour.

While digital printing is ideal for customising prints for small runs, colour accuracy cannot always be guaranteed, even with a good profile. With spot colour the user can obtain hues that are outside of the CMYK gamut), such as fluo yellow, fluo magenta and Chinese red, to get more accurate colour reproduction. ■

Chinese Red is Encres Dubuit Group's new spot colour for UV LED inkjet digital printing

Gallus Screeny

Rotary screen printing
The Screeny A-Line products are based on proven processes and new technology and represents the characteristics of extreme spring hard, strength and high speed. The recognised high quality of Screeny screen printing plate is enhanced with new strength properties, which include extreme spring hard factors. This particular feature is created by the new base structure which combines high strength and an excellent resiliency. The extreme stability of the Screen printing plate is particularly well suited for longer and larger print jobs and for maximum reuse.

Flat screen printing
Gallus offers an end-to-end solution for industrial glass / container screen printing – a fully integrated printing system with machine-produced screen printing plates. The new Gallus Screeny G-Line and C-Line screen printing plates set new standards in cost-efficiency and production reliability when decorating hollow glass and containers with industrial screen printing techniques.

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Valiani distributed by Graphtec America

Increased demand for large format flatbed cutters in the US market has seen Italian flatbed cutter manufacturer Valiani cooperate with sales company Graphtec America.

Valiani manufactures Optima V 250 (4' x 8') flatbeds, distributed in the US exclusively by Graphtec America. The addition of the Valiani Optima V 250 complements Graphtec's product line of flatbed cutters in both size and quality.

Valiani is already cooperating with European partners including Konica Minolta, Ricoh, Roland DG and KBA. ■

Valiani and Graphtec have teamed up to meet demand for large format flatbed cutters

GIS receives second Queen's Award for Enterprise

On 13 July Global Inkjet Systems (GIS) headquarters was visited by Her Majesty's Lord-Lieutenant of Cambridgeshire, Mrs Julie Spence OBE QPM, for the presentation of the company's second Queen's Award for Enterprise.

The Awards recognise outstanding achievements by UK companies in International Trade, Innovation and Sustainable Development.

A technology provider to OEMs and system builders in the inkjet industry, GIS received the Queen's Award for Enterprise 2018 for International Trade, in recognition of its growth in overseas markets from 2015 to 2017. GIS received its first Queen's Award for Enterprise for International Trade in 2013.

After a tour of the GIS premises the Lord-Lieutenant gave a speech to assembled GIS staff and guests. The Lord-Lieutenant was accompanied by her Deputy, Chris Parkhouse and the High Sheriff of Cambridgeshire, Dr Andy Harter CBE.

"This Queen's Award is for all the GIS team, collectively recognising every individual's contribution," commented Nick Geddes, CEO of GIS. ■

Presentation of the Queen's Award for Enterprise 2018 to GIS by the Lord-Lieutenant of Cambridgeshire, Mrs Julie Spence

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Vastex Flash Cure autorotation now with HMI touchscreen

Vastex International's Flash Cure Units equipped with optional Auto-Flash automatic head rotation now come standard with an HMI (Human-Machine-Interface) to control dwell time and direction of head rotation.

The Auto Flash device rotates the head of any Vastex Flash Cure Unit into place above the pallet, and automatically rotates the head away from the pallet after a user-adjustable dwell time has elapsed allowing operators to print multi-colour designs without burning or under-flashing the printed image.

"The HMI displays a 'ready' message for the next cycle, the user-adjusted dwell time and the direction of head rotation, and is more visible from a distance than previous displays," explained Vastex President Mark Vasilantone. "It also improves cycle reaction by responding accurately whether the foot switch is pressed during or following a flash cure cycle."

The Auto Flash unit features a high-torque DC gear motor and an eccentric arm drive that actuates head rotation progressively for smooth starts and stops, and a foot pedal switch with 2m cord for operator convenience.

A 'Breakaway Detent' feature stops the head from rotating if it encounters an obstacle, maximising operator safety while minimising damage to the flash cure head, the Auto-Flash gearbox and/or the screen printing press. ■

All Vastex Flash Cure Units equipped with optional Auto-Flash automatic head rotation now come standard with an HMI to control dwell time and direction of head rotation

SPS TechnoScreen offers Cold Foil technology for screen printing

Already used in combination with both offset and flexographic printing, Cold Foil technology is now available for screen printing.

The process begins with a varnish or glue printed using traditional screen printing technology. After printing, a pre-cure by LED UV improves the adhesion of the varnish. Then the Cold Foil is applied by means of two rubberised rollers on top of a large size diameter cylinder drum. The foil remains on the printed area and the rest is stripped away. A final LED UV curing finishes the product.

When an SPS Cold Foil unit is placed in-line with an automatic SPS Stop Cylinder Screen Printing Machine, the Cold Foil unit starts with a fold-down transport belt segment that enables sheets to be transported out of the screen printing machine, directly into the Cold Foil unit. Activation/Deactivation is automatically synchronised with the printing machine. Up to five different rolls of foil can be loaded in the machine simultaneously, with minimum roll width about 200mm.

The unit is equipped with water-cooled LED UV units for pre- and post-curing. Embossing can be achieved by printing a high-built varnish on which the foil is applied. The unit works within a speed range of 800–3.000iph.

In addition to Cold Foil, the unit can also be used for Cast & Cure, achieved by laminating the casting film to a wet UV varnish. While these two surfaces are in contact, LED UV light is passed through the film to cure the varnish underneath the film. Then the film is delaminated from the surface and rewound for future use. The film can be reused up to five times. Casting film is available in a wide range of effects. ■

Cold Foil is applied by two rubberised rollers on top of a large size diameter cylinder drum

SPS Cold Foil unit in-line with an automatic SPS Stop Cylinder screen printer

Sensient adds local distribution capability in Turkey

Switzerland-based developer and manufacturer of digital inks, Sensient Imaging Technologies has invested in local warehousing and distribution to better serve the growing Turkish textile market.

The company will now house a direct supply of Sensient digital inks in Turkey, providing new and existing customers with direct access to inks; removing delays in the importation process and simplifying the local supply chain.

Digital printing in the Turkish textile industry has shown a rapid increase with a current forecasted annual average growth rate of 12.5%.

"This market development combined with a strong support network in Turkey and the release of new digital inks in 2018 has resulted in significant growth for Sensient in the region," commented Mike Geraghty, President of Sensient Colors. "As a result, Sensient is reaffirming its commitment to support our partners and customers in Turkey by investing in local warehousing of inks."

Initially, Sensient will stock selected products to serve the growing installed base with plans to increase both the volume and the product range when necessary. ■

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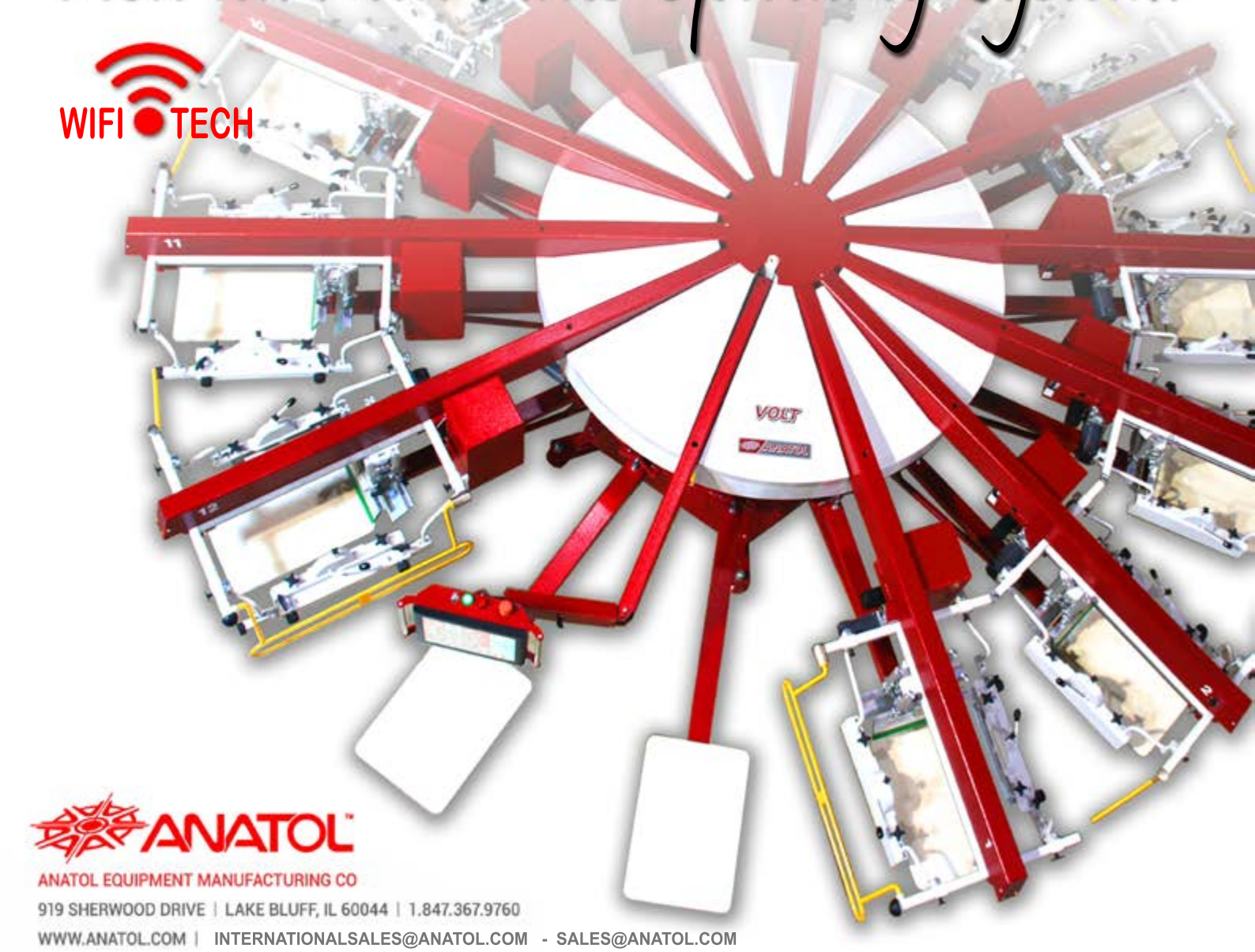

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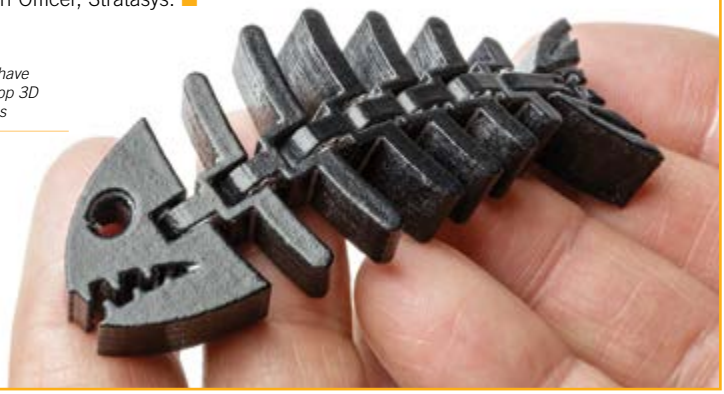
Xaar and Stratasys partner for 3D printing investment

Joint investment from Xaar PLC and Stratasys has resulted in a newly formed company: Xaar 3D Limited, which will develop 3D printing solutions based on High Speed Sintering technologies. Xaar 3D Ltd will benefit from Xaar's technology relating to High Speed Sintering and industrial piezo inkjet printheads, along with the commercial and market experience of Stratasys.

Xaar will hold 85% of Xaar 3D Ltd shares with Stratasys holding 15%. In addition, Stratasys has been granted an option to increase its ownership in Xaar 3D Ltd to a total of 30%. Xaar 3D Ltd will hold all of Xaar's High Speed Sintering assets. The new company's Board will be chaired by Xaar CEO, Doug Edwards.

"This joint investment in the development of 3D printing technologies reinforces the value created by our R&D and continues our plan to diversify Xaar's business," said Edwards. "We are also pleased to be working alongside a leader in the 3D printing space, who recognises the value of Xaar's technology and expertise."

"We believe that the complementary assets of Stratasys and Xaar will enable Xaar 3D Ltd to develop solutions that further address customers' additive manufacturing requirements for a broader range of production applications," commented Scott Crump, Chief Innovation Officer, Stratasys. ■



Xaar and Stratasys have teamed up to develop 3D printing technologies

Beith Digital chooses Vutek for day/night printing

Sandton, South Africa-based Beith Digital has installed an EFI Vutek 5r roll-to-roll LED inkjet superwide-format printer to improve its graphics capabilities and deliver higher-quality backlit prints for its increasing number of European clients.

The company also owns additional Vutek UV and LED printers and an aqueous dispersed dye sublimation Vutek FabriVU soft signage printer and is capable of direct digital printing on virtually any type of substrate, from rigid to roll-fed.

"In the past, we had to run backlit images as a standard profile to suit the day, but at night it would be washed out because we couldn't print both sides," explained Devyn Wagner, Beith Digital's Managing Director. "With the 5r we can now offer them the best solution. The printed image will always look its best – in daylight as well as at night."

The company was also looking for a machine that uses the latest curing technology at a speed and quality that would allow it to produce large volumes of outdoor work.

"Before we had the Vutek 5r installed, we were using UV technology that was only capable of running 150 square metres per hour compared to the 400 square metres per hour we now currently run, matte or gloss," said Wagner.

The multiple-roll capability and automatic inline finishing options available on the printer allow the company to be much more productive. "With the 5r, we can offer even the most demanding clients a much quicker turnaround than ever before," Wagner stated. ■

The Vutek 5r's automatic backlit printing option and high-quality white ink enable Beith Digital to meet evolving customer demands

New colours and faster matching service from Mactac

Mactac Europe has launched 16 new colour choices and faster colour-matching for its MACal 9800 Pro range – including six new colours inspired by Mondrian's palette.

The expanded MACal 9800 Pro range includes four new High-Tack grades (Black and White in matt and gloss), two Bubble-Free grades (Black and White, gloss), six new matt colours and three new metallic colours.

"MACal 9800 Pro is one of our most important premium-quality films with bright, opaque and long-lasting colours using high-quality pigments," said Oliver Guenther, senior director marketing and channel strategy for Mactac Europe. "The solvent adhesive formulation avoids issues such as cracks, edge-lifting and shrinkage.

"We have also improved our Colour Matching Service, which is now available for as few as 15 reels for all films other than High-Tack and Bubble-Free," added Guenther.

Converters can send a sample of the required colour (or supply a RAL reference), and will receive an initial colour match sample within two weeks. ■

Lawson releases new Dynamic Ink Series

In conjunction with Multi-Technologies, Lawson Screen & Digital Products has launched a new line of Ready for Use plastisol ink designed for production printing on automatic or manual presses.

A soft-hand, fast flashing, low-cure ink with high opacity, Dynamic Ink is ready to use out of the bucket with no modification and provides strong colour with a smooth, semi-gloss finish. The new ink is suitable for cotton and 50/50 garments and colours can be readily intermixed so screen printers can easily print and cure t-shirts, long sleeves, shorts and other textile garments.

A full line of colours is available. Dynamic Ink is also available with Multi-Tech's Multi-Match ink mixing system and can be made to match any Pantone colour. ■

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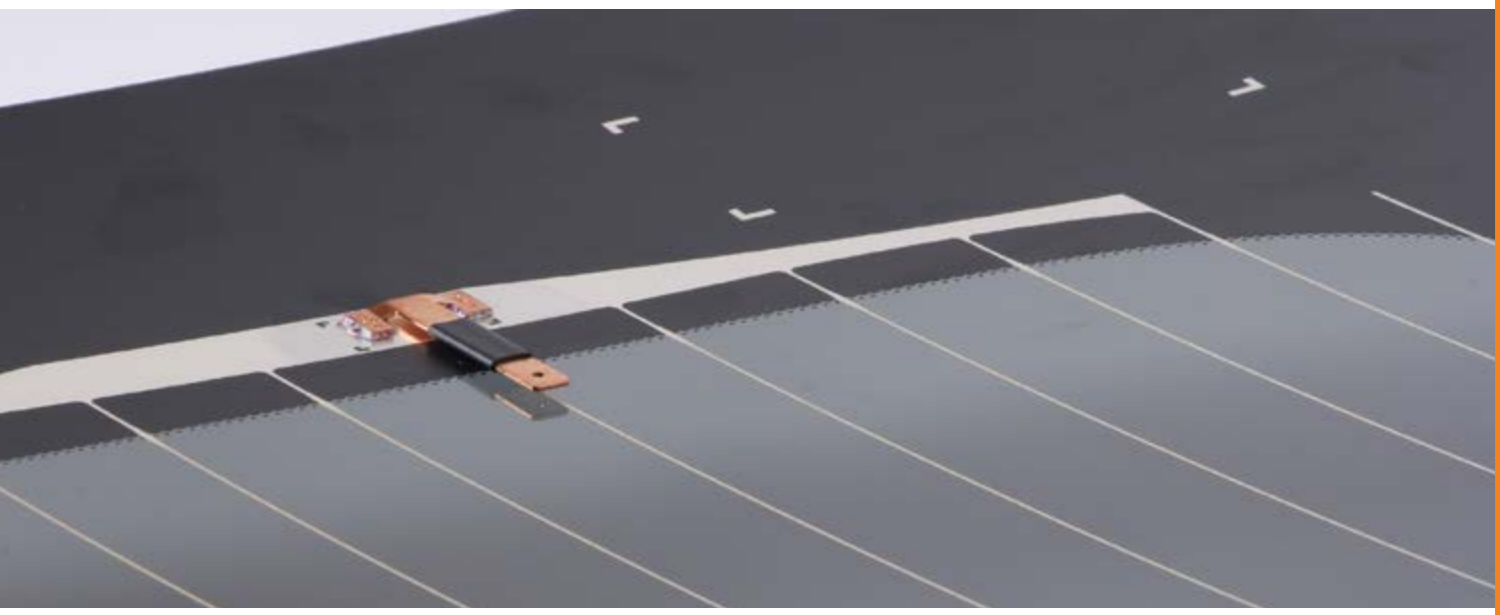

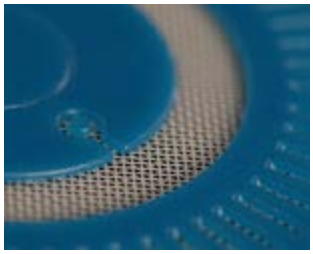

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