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MESSAGE FROM BRYAN COLLINGS

With the New Year festivities behind us, *Specialist Printing Worldwide* is committed to assisting printers as we embark on what we all believe will be a slow but sure climb out of the recession which blighted trading in 2009 for so many of us.

As well as presenting the latest technical information in every issue, the Process Information Centre is now up and running at www.specialistprinting.com – each button has been commissioned by one of our major supporters and during the next few months will have content added. The first and second buttons already have content but we do know that over time, more will be added as time permits, so it's worth revisiting the site from time to time.

Reflecting our high standing in North America, we are delighted to announce that the SGIA have agreed to be one of our sponsors. Each issue, the SGIA will update us on the North American scene, which will be of great interest to our global readers.

We regularly have readers asking why they haven't received their own personal copy. As a technical journal, we need subscriptions as we cannot live by advertising revenue alone. If you have not yet subscribed then this is your free promotional copy; if you value this magazine and want to receive it in future, go to http://www.specialistprinting.com/sub_form.htm and subscribe for only €55 / $80 / £45 for one year. We accept credit cards or can invoice if you wish.

Bryan Collings, Publishing Director,
Specialist Printing Worldwide

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Agfa acquires Gandinnovations

Agfa Graphics has acquired Gandinnovations, manufacturer of large format inkjet systems, in order to significantly increase its presence in large format inkjet printing; the combined portfolio of products now ranges from entry level through flat bed and roll to roll systems up to high end presses. "The combination of Gandinnovations' products and Agfa Graphics' products will result in substantial growth for our inkjet business based on an even more complete system portfolio," said Richard Barham, Agfa Graphics' Vice President Inkjet. "As our own portfolio consists of entry-level and high-end inkjet systems, Gandinnovations' mid-range systems are a 100% complementary fit with our existing inkjet technology."

"Joining Agfa Graphics offers Gandinnovations' staff and customers tremendous opportunities for the future," added Hary Gandy, Gandinnovations' CEO and co-founder. "The combined capabilities and coverage in customer service and research and development will accelerate the launch of new products, deliver new business opportunities and further expand our service to our customers." Gandinnovations is headquartered in Mississauga (Canada) and employs 256 staff worldwide. ■

High resolution photoemulsion for electronic printing applications

Kissel + Wolf has developed a photoemulsion for excellent results with the highest resolutions. Azocol Z 175 photoemulsion can achieve a resolution from 50 µm down to 20 µm with a correspondingly fine mesh, both in positive and negative. To achieve the finest resolution the manufacturer recommends that the emulsion build-up is kept below 10-12 µm, with an EOM value (emulsion build-up above the mesh) from 1 to 5 µm with an Rz value around 5 µm. The exact exposure time should be defined using the step exposure method, in which 5 to 10 second intervals are recommended.

Azocol Z 175 has optimum resolution on both steel and polyester mesh. It has also demonstrated high print-run resistance to the aggressive print media used in the electronics industry, especially those containing n-methyl-2-pyrrolidone (NMP), and is also resistant to conventional water-based, UV and solvent-based ink systems. ■

Azocol Z 175 photoemulsion can achieve a resolution from 20-50 µm, both in positive and negative

Front-end software for digital finishing systems is released

Zünd has unveiled the Cut Center, its new front-end software suite for all Zünd cutter functions. The Zünd Cut Center automatically selects the correct cutting tools, machine parameters and material handling options based on the job details and the cutting system configuration, and communicates with third party software vendors such as RIP software, design or CAD packages and / or ERP systems. The integrated Cut Server and Cut Queue functions enable enhanced workflows for easy production planning, job scheduling, job traceability and quality assurance. According to the manufacturer, the Cut Center works with all well known CAD / design software, pre-press workflow and RIP software, as well as common MIS and ERP systems and has been designed to match the flexibility of the modular Zünd G3 range of cutter systems. ■

Roland expands media range

Roland has added 20 high quality materials to its media range, which can be viewed on its new website. Roland's Media Center offers materials for various applications, including newly added blue-black paper for billboard and poster printing, and carbon cutting foil for wrapping car parts, i-Pods and laptops. The new website (www.rolandmediacenter.eu) gives product descriptions, specifications, areas of application and prices for Roland's media range, and also features a search engine for online searching and ordering via the relevant Roland agent. ■

Roland has updated its Media Center and launched a new website

The Soljet Pro III XC-540MT inkjet printer / cutter featuring CMYK, white and metallic silver ink

Inkjet printer / cutter with metallic silver ink

Roland has released the Soljet Pro III XC-540MT, a 54-inch (137 cm) inkjet printer / cutter featuring CMYK, white and new metallic silver ink. The award-winning silver ink can be printed as a spot colour or combined with CMYK and white inks to produce a range of coloured metallic effects including gold, bronze and pearlescent colours.

The XC-540MT is an integrated printer / cutter for a range of applications including vehicle wraps, T-shirt heat transfers, labels, decals, POP displays, banners and signs. It achieves a maximum print speed of 41 m²/hr and image quality of up to 1440x1440 dpi in CMYK mode. It features six colours: CMYK, white and metallic silver (CMYK+MT+W) or CMYK and double white (CMYK + WW). The XC-540MT also has a heavy-duty media handling system, automated maintenance, the DU-540 dryer / blower unit and Roland Intelligent Pass Control. The machine is compatible with vinyl, PET film, canvas, paper, transparent film, banner and more. ■

New mesh company enters screen printing arena

Daniele De Rosa, former Chairman of ESMA, has founded Extris, a new company which aims to supply meshes for everyday print jobs at reasonable costs. Extris offers a range of polyester monofilament fabrics to stretchers and printers through a small network of independent partners. The company has designed a 'no frill fabric' which meets a defined list of basic performance criteria such as elongation, stability, relaxation and geometry regularity. ■

Manufacturer sees changes in screen printing

Thieme, a German manufacturer of screen printing machines, has noticed that the screen printing market is currently undergoing a process of segmentation and specialisation – large print service providers are increasingly opting for fully automatic multi-colour lines while smaller companies are specialising in technical niche applications, the company says, and industrial screen printing is also playing an increasingly important role.

Thieme also believes that, due to the increasing use of large-format offset and digital printing machines, the screen printing market is facing radical changes: simple mass applications are now mainly produced using the offset process, while screen printers are returning to their core competence: the production of high-quality print products. ■

Survey shows printers are innovating out of recession

A recent Economy Survey conducted on behalf of FESPA shows that the wide format printing industry is using innovative and proactive sales and operational strategies to improve its business fortunes in 2010, with 70.2% of respondents using new products or processes to help them through the economic downturn, 61.5% adding products to their portfolio and 60.6% entering new markets.

The survey of 217 respondents was conducted in the fourth quarter of 2009 by InfoTrends. More than 20% of respondents thought the market was already recovering, and over half expect recovery to previous levels by the end of 2010. The survey also showed that 93.1% agreed that there has been an economic downturn in the industry, with 56.4% viewing 2009 as the worst year they have ever seen. The mean level of business decline reported was 15%; manufacturers and resellers reported the same average decline as print service providers.

Almost 66% of those surveyed reported that competitors had consolidated or gone out of business, and 60.6% said they were price-compared more frequently by new and existing customers with 75% also citing intensified pressure on production speeds or turnaround times.

"These latest findings stress the need for printers to offer services that stand apart from commoditised print offerings," FESPA's Marcus Timson commented. "Cutting prices to match the shop across town is not the answer. Printers will thrive when they offer services and solutions that help customers execute their marketing and retail campaigns more effectively." ■

New ion flatbed printer

The latest Solara ion flatbed UV printer from Gerber Scientific Products has been unveiled. The new Solara ion^Z has eight print heads and a 14 picolitre drop size print engine. It uses GerberCAT cationic UV inks for a high degree of UV ink performance and Gerber's Cold Fire Cure low energy cure technology which operates at nearly room temperature, allowing the user to print on heat-sensitive materials such as paper-based products, thin styrene and corrugated plastic. ■

Hardcoated films come to the rescue

MacDermid Autotype's Autotex hardcoated film substrates have been used by German company Richard Wöhr for the front panel graphics, tactile membranes and circuit switch layers of membrane keyboards and graphics panels. Richard Wöhr, which produces components for user interface systems and displays for applications in electronics, medical and mechanical engineering, recently acquired membrane keyboards manufacturer KM-Gehäusetech. Quality issues soon arose with the films used by KM-Gehäusetech, particularly with embossed panel areas and membrane keys fracturing due to mechanical stresses and poor adhesion of the under-surface printing inks and inferior chemical resistance.

MacDermid Autotype's hard-coated polyester-based Autotex films have long flex life and excellent resistance to chemicals, UV light, high humidity, temperature and mechanical wear and tear. They can be integrated into clear display windows and be easily embossed, and are available in textured finishes for screen, ink-jet and digital printing. ■

MacDermid Autotype's Autotex hardcoated film substrates were used for graphics panels

IMPORTANT

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New texture library for printer / cutter range

Roland has introduced its Texture System Library for its VersaUV LEC-300 and LEC-330 UV printer / cutters. The library consists of 22 textures and patterns that can be produced by layering the VersaUV's Eco-UV gloss ink; it is included in version 3.31 of Roland VersaWorks RIP software and is supported by popular design packages including Adobe Illustrator.

The VersaUV inkjet printer / cutters feature six colours (CMYK + White + Gloss) and produce rich, textured graphics in virtually any shape on a wide range of flexible and rigid media. The new Roland Texture System Library makes it easier to enhance VersaUV graphics with special textures and patterns: users simply select a texture or pattern from the swatch library and apply it to their graphics for instant effects. ■

Distribution agreement targets Italian market

Atlantic Zeiser has signed a distribution agreement with Securjet to strengthen its position in the Italian market. Securjet will sell products from Atlantic Zeiser's Omega 36, 72 and 210 printer range, as well as the Gamma 70, and will also provide technical support for the products. The two companies plan to target the Italian packaging and industrial application channels. "Securjet has the customer base and experience necessary to help us develop new commercial opportunities and expand our market share in the region," explained Luigi Rescaldani, General Manager of Atlantic Zeiser.

The Omega range of printers uses UV Smartcure inks and can be configured to meet manufacturers' specific requirements. The print heads deliver flexographic printing quality and can produce variable data printing on all types of plastic cards, packaging, labels and safety cards. The Gamma 70 is a single-pass, four-colour (CMYK) compact print head design with economical UV curable inks that adhere to a wide variety of porous and non-porous substrates. It is designed to print labels and industrial product identification on traditional materials such as paper and cardboards, and on a variety of other media such as film, plastic cards and metallic foils. ■

Securjet will sell products from Atlantic Zeiser's Omega printer range

Powerful UV hand lamp released

The BEH 250 hand-held UV lamp

Beltron has developed a new UV hand-held lamp for mobile use in intense UV radiation, for curing fillings and for bonding different materials such as glass and plastic. A user-friendly and powerful torch has optimised air cooling to work with the hand-held 250 W UV lamp with separate ballast. The torch stays cold for many hours of operation. The docking station has been designed so that no stray light – and therefore no UV radiation – escapes. The BEH 250 hand-held UV lamp is available with iron, mercury or gallium emitters and can also be equipped with various filters. ■

Entry-level printer unveiled

Kornit Digital has launched its 921 Breeze, an entry-level direct-on-garment printer for small and medium level production businesses, which has been designed to allow garment decorators to use high-end technology benefits at entry-level costs. This new digital unit can print on both dark and light garments and includes an integrated automatic pre-treatment system. The

The Kornit 921 Breeze is an entry-level direct-on-garment printer for SMEs

ink system includes six industrial print heads (CMYK and white) with 256 nozzles in each. The Kornit 921 Breeze can be hooked up to any computer without the need for an air compressor, and uses Kornit's proprietary pigmented ink and the Kornit QuickP Ripping application. ■

Combo laser die cutting machine launched

Spartanics has launched a combination web and sheet-fed laser die cutting machine. The Finecut Combination model laser die cutting machine has been designed with flexible features so all types of printing processes can be finished by the same machine. Combinations of cutting and marking details can be made in one cycle, and its single source laser design gives defect-free cutting and offers the ability to stitch images together for unlimited X-direction part dimensions. The hybrid product interchanges rolls with sheets to enable printers to undertake short run sheet jobs and then switch to long run flexo jobs to maximise operational efficiencies. It operates at up to 125 m/min web speed with single source lasers. ■

The hybrid product interchanges rolls with sheets to maximise operational efficiencies

UV inkjet roll to roll printers for PE poster market

Fujifilm has launched its Uvistar series of UV inkjet roll to roll printers to the European market. These new printers use Fujifilm Sericol's Uvijet QK inks and can print on rolls of up to five metres wide. The Uvistar series has been developed for the new format of woven polyethylene (PE) single skin billboard posters which can be clipped or stretched into frame holders, which the company believes will soon replace traditionally-pasted billboards. The Uvistar is available in four different models with throughput speeds of up to 300 m^2/hour. The multi-roll system can produce jobs on a wide range of flexible media, including PE, with no curing or ink starvation issues and with excellent inter-coat lay down for backlit and solid prints. The Uvijet inks are also low in odour.

PE material is more environmentally-friendly than PVC and weighs much less, and eliminates the pasting process necessary with traditional billboards. The five metre, 32 head version of the Uvistar printer is available for customer demonstration at Fujifilm Sericol's facility in Broadstairs, UK. ■

The Uvistar series of UV inkjet roll to roll printers has been developed for PE single skin billboard posters

SCREEN PREPARATION FOR XL PRINTING PROCESSES

Andreas Ferndriger describes some screen preparation technology that has been updated to handle the largest screens on the market

> "The following article has been included because there have been a lot of developments in screen printing large areas using extra large screens and we felt that many of our readers would be interested to have an insight into what is currently being done. We were very pleased to have Grünig, who have a big involvement in this area, write it for us."
>
> **Bryan Collings, Publishing Director**

FOR MANY PRODUCTS IN COUNTLESS industries and market sectors, finishing using screen printing is the optimal choice of technology, regardless of whether the printing is to produce a graphical effect or a technical advantage. In all applications, the main purpose is always to achieve an additional value and to give the final product a unique touch.

Screen printing processes of this kind require faultless screen preparation. An optimal screen is considered indispensable in order to achieve perfect printing results, and this is especially true for large-size printing processes. Nowadays, some sectors even use screens up to a size of 4.5 x 12 metres. These XL printing sectors typically include plate glass printing (e.g. for architectural glass), graphic serigraphy printing (e.g. for outdoor advertising) and flag printing.

Grünig-Interscreen, a Swiss specialist for professional screen preparation in the serigraphy industry, offers a complete range of standardised and automated screen preparation products for every sector and screen size. Even for XL screens, the Grünig range features a large number of possibilities and options. Extremely large XL screens should always be handled by automatic equipment as manual processes involve considerable quality fluctuations, which results in high reject rates and costs.

For this reason, it is very important that particular attention is paid to the following processes:

- Frame profile: the correct dimensioning for XL screens guarantees excellent printing stability
- Mesh stretching process: stretching the appropriate mesh to the required stretching value and fastening it in an optimum fashion
- Mesh preparation: mesh cleaning, degreasing and drying
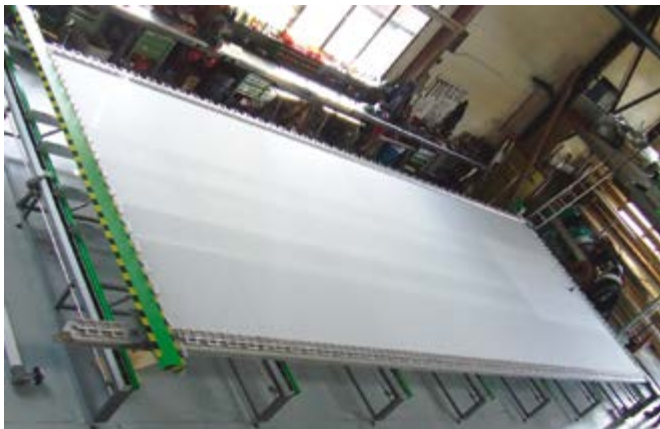
The stretching machine for large-size formats

- Coating process: uniform application of the emulsion directly onto the mesh
- Illustration / imaging: Computer-to-Screen (CtS) technology gives very high quality film-free illustration
- Developing process: automatic washing-out of the emulsion in a regular and standardised manner
- Washing process: unattended screen washing using closed-circuit washing processes.

The past year has been clearly marked by a growing tendency towards XL screens. In the sectors of stretching, coating and washing, Grünig-Interscreen has installed some of the biggest machines ever constructed.

STRETCHING

What is believed to be the world's biggest stretching machine for large-size screens is due to be installed in Germany. The G-Stretch 281 XL is capable of handling a maximum mesh size of 4.5 x 12 m – that is, an incredible mesh surface of 54 m^2. The loading process for these screens represents a major challenge – a screen of this size weighs approximately 300 kg, which means that it must be loaded and unloaded using a crane.

The automatic coating machine

An automatic in-line washing installation

An additional difficulty was to find polyester mesh of this size – usually available mesh products go up to a width of 400 cm and larger widths are extremely difficult to obtain. However various manufacturers have started to fill this market gap.

The mesh tension also has its own special requirements: it must be sufficiently high on the entire surface and not exceed or fall short of strict tolerance values. A stretching value of 25 N/cm and a tolerance of +/- 1 N/cm are required for this application.

The concept of the large-size stretching machine allows significant money savings because, due to the machine's software taking the mesh extension into account, a higher benefit can be achieved while using less mesh. For example with a maximum mesh surface and a mesh extension of 7%, this machine can save about 4 m² of mesh.

COATING

What is believed to be the world's biggest coating machine was also implemented last year in Germany. The G-Coat 421 XL has been designed for automatically coating both sides of a screen with a maximum size of 4.5 x 11 m. For this particular coating application, it was decided to opt for a vertical screen position so the process is carried out in portrait position. Here, too, a crane must be used for loading and unloading the heavy screens; this process also needs to be confined to a lateral loading platform in order to protect the coating head and prevent it from being damaged.

The special challenge in this case was to provide a sufficient amount of direct emulsion in the coating troughs to coat the coarse mesh type with a total coating surface of 3.8 x 10 m. The wet-in-wet coating process is carried out on both sides, achieving an optimal coating quality and providing the basis for high quality CtS illustrations.

WASHING

In the washing sector, the G-Wash 175 XL standardises and automates the developing process. Ideally, this solution should be combined with a CtS installation and operated as an in-line concept, so that one solution takes care of several processes without requiring the presence of an operator.

The G-Wash 141 XL automatically cleans the XL screens after the printing process – one of the biggest installations in the world, with a total length of 30 m, was put into operation in Belgium last year.

Both models have been designed for automating wet processes, enhancing cleaning results and lowering operating costs. One of the main objectives was to optimise and thus lower the consumption of solvents, water and chemical products, thus these machines represent an important contribution to safety-related and environmental aspects in light of ever-increasing requirements imposed by environmental protection laws and the regulations regarding occupational health and safety. Grünig-Interscreen's closed-circuit and filtering systems are therefore an essential part of the company's overall solution. ■

Andreas Ferndriger is Sales & Marketing Director of Grünig-Interscreen

CTS GOES XL

Thomas Schweizer reports on the installation of one of the biggest and most high-resolution CTS systems for screen printing

MORE AND MORE LARGE formats are being produced for the graphic and for the industrial screen printing market in particular, including manufacturing plants specialising in construction, architectural and automotive flat glass printing, aircraft interior panelling, textile flag printing and large-format decorative applications for the furniture industry. Consequently more large-format silk-screens need to be produced, stringed, coated and copied. There will soon only be a restricted amount of a maximum 1600 mm wide film available for the production of printing plates in these areas, so only image sizes of approximately 1500 mm can be produced.

In all areas of graphic printing the use of graphic film material is becoming less important and will probably die out. This has happened to offset printing with CTP (Computer-To-Plate) technology with the advent of digital photography and professional movie film. The future of this technology belongs to the high-resolution movie projectors and high-tech video projector systems which use the same technology, Texas Instruments' Digital Light Processing (DLP) technology.

Textile and screen printing companies switch from conventional analogue to future-orientated digital CTS stencil production to reduce production costs and improve the quality of the printing plates and its results. It is only with the filmless CTS technology that copied printing stencils can be adequately and quickly produced in-house upon receipt of the printing order and sent to the printing machines for press-printing. All printing stencils requiring an extra wide format can only be produced digitally while being UV-exposed at the same time.

CTS TECHNOLOGY

SignTronic's Computer-to-Screen technology (CTS) is designed for direct screen exposure. The digital image transferring technology means the graphic PC-processed printing files are transferred at high speed onto the pre-coated, UV-sensitive silk-screen at a very precise resolution. During the exposure the copy material is thoroughly UV-exposed on the spots that should not get printed, making them chemically and mechanically UV-dried and stress-resistant. The non-exposed parts on the stencil are washed out with water during stencil development, which results in open and closed spots on the screen. Finally, the printing colour is coated only through these open mesh openings via rubber squeegee.

Using CTS technology for printing plate production helps to eliminate the costly film material and the expensive and environmentally harmful chemicals needed for developing the film. There is no more need for storing the obsolete separate copy frames and the metal halide exposing devices at stencil production. The very bright MH-light sources with a lamp power of 8 kW use much more energy in comparison to the CTS StencilMaster.

Due to its integrated conveyer belt system and software interface which recognises the signal and cycle interaction between the STM and the coupled machine unit, all SignTronic CTS systems can be used in-line with other printing plate machines (such as in-line screen cleaning, de-greasing, de-coating, coating, developing, waste water treatment and for final stencil drying). These steps help to ensure a completely automated printing plate production at a full stencil capacity load, while obtaining optimal resolution results and requiring a minimum of staff.

With the rising demand in wider textile and screen printing stencils, CTS systems with better and higher resolution are needed. SignTronic's CTS products have real (not interpolated) CTS resolution of at least 1270 x 1270 dpi in both exposure axes. Smaller stencil formats with a frame size of 1850 x 1450 mm are available at a real resolution of 2400 x 2400 dpi.

CASE STUDY

Siebdruck-Service Keck in Ulm, Germany, is a professional supplier of printable stencil copies for all graphic and industrial screen printing companies who do not have an in-house stencil production. Keck challenged SignTronic's StencilMaster CTS technique by setting the highest standard for quality and technique of the format and resolution, so as

SignTronic's StencilMaster

The CTS StencilMaster during installation

The installation is nearly finished

SignTronic's XL wide-format StencilMaster-CTS installation at German customer Keck

The StencilMaster installation at Keck in Germany

to produce good quality, precise and very wide-format stencils for the flat glass industry. SignTronic's construction and technical personnel fulfilled this challenge.

After a four week period in which installation, set-up and training took place, a newly-developed CTS system that was ready for production was handed over to a satisfied customer. ■

Thomas Schweizer is Director Sales and Marketing for SignTronic

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A Flexo printing unit with DRP system

Radial runout of a mandrel

Radial runout of a mandrel; the green line shows the base of the mandrel and the black line shows its tip

NEW OPTIONS FOR TUBE DECORATION

Harald Gavin explains the advantages to tube decorators of a new system for flexo printing

OFFSET PRINTING AND SCREEN printing have long established their role in direct printing onto flexible tubes for cosmetic and personal care products. Now advances in servo technology have made tube decoration with flexo printed images a reality.

Offset printing is being used very successfully in tube decoration for printing halftone images and colour gradients, but dot deformation prevents printers from printing photo-realistic images. Screen printing offers a thick ink laydown that enables printers to create vibrant images, even on dark tubes; however the resolution achievable with modern mesh and modern machines is not sufficient for printing photo-realistic images. Often a combination of offset printing and screen printing is used for printing images with colour gradients and bold colours. The disadvantage of this combination is the need for two printing machines, so changeover times are longer and costs are higher.

The quality of flexo printing has significantly improved over the last few years, and the use of flexo printing for tube decoration has been a wish for tube decorators for some time. High quality flexo printing onto tubes requires a constant gap width between the flexo plate roller and a mandrel that rotates a tube during printing in a flexo printing station; gap width variations should not exceed the range of ±0.05 mm (in comparison, the diameter of a normal human hair is 0.05 mm).

THE RADIAL RUNOUT

Mandrels have a radial runout in the range ±0.15 mm. Radial runout causes variations in the set gap width between a rotating flexo plate roller and a rotating mandrel. A variation in gap width would vary the printing pressure and this would prevent printing of sharp dots.

It was assumed that the effect of the radial runout could be virtually eliminated by moving the flexo print assembly (flexo plate roller, Anilox roller and ink chamber) in such a way that the gap width is kept constant. A test rig was built and the assumption was proved to be right, but building a flexo printing unit with moveable flexo printing assembly is not straightforward.
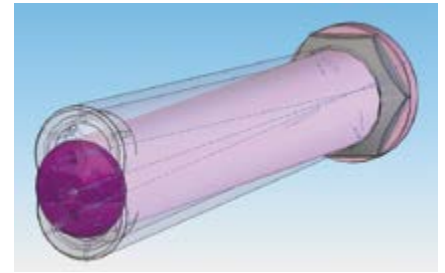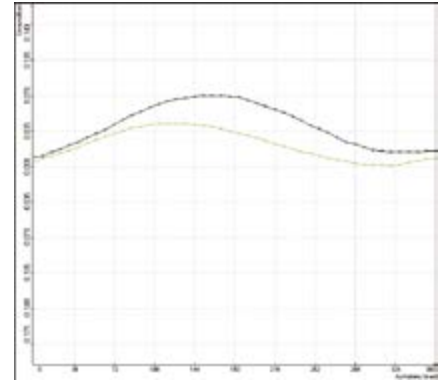
The radial runout at the base of a mandrel is smaller than the radial runout at the tip; the maximum runout at the tip and the maximum runout at the base occur at different rotational angles. Therefore, two servomotors are required to independently move each side of a flexo printing assembly. In addition, radial runout is specific to each mandrel, so a flexo printing assembly would need to be moved in a different way for each mandrel.

The tube on the left was printed with DPR, the tube on the right was printed with DPR switched off

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Printing units can be exchanged easily using a specially adapted hand winch cart

A measuring station was built to measure the radial runouts at the tip and the base of a mandrel. The measurements were used to calculate two movement profiles, one for each side of a flexo printing assembly. A servo control system used these movement profiles to control two servomotors that moved the sides of the flexo printing assembly independently. This system is known as the Dynamic Roller Positioning system (DRP system), for which ISIMAT has filed a patent application.

THE PRINTING PRESSURE

Setting the printing pressure with an active DRP system ensures that even small dots are perfectly printed. When the system is switched off there are some areas that are perfectly printed, some areas are not printed at all and other areas where dots are squashed. Printing without a DRP system requires higher printing pressure to ensure that the whole image is printed, but the pressure will be too high in some areas and the print in these areas will look smudged.

The first hybrid printing machine with screen printing units and flexo printing units has now been tested and shipped to a customer's site; each of the flexo printing units has a DRP system. The hybrid printing machine has a rotary indexing ring; the indexing ring has 22 station heads, each holding a mandrel. The ring indexes the mandrels to the machine stations. The machine has eight printing stations; each station can take a screen printing unit or a flexo printing unit. Screen printing units and flexo printing units are exchangeable – any combination of these units in the eight printing stations is possible.

A COMBINATION OF UNITS

The combination of flexo printing units and screen printing units in one hybrid printing machine enables tube decorators to take advantage of the strengths of the two printing processes: flexo printing for printing photo-realistic images and screen printing for printing solids and texts.

Tests have shown that the performance of this hybrid printing machine has exceeded the high expectations of the designers. These tests also give an indication of the potential of this new tube decoration machine. Direct flexo printing onto extruded tubes will give packaging designers new and exciting options, the Dynamic Roller Positioning system will ensure that high quality eye-catching decoration will be delivered. ■

Harald Gavin is Director – International Sales for ISIMAT
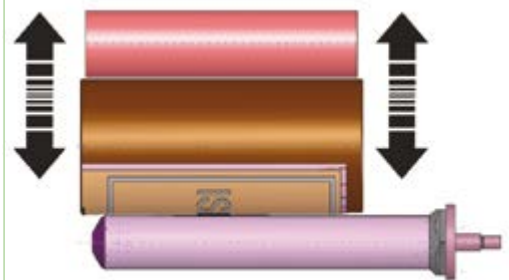
The two sides of a flexo printing unit have to move independently from one another

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INCREASING PROFITABILITY IN PRODUCTION

Tim Quinn describes how to decrease make–ready time and increase run–time in order to achieve neutral colour faster and maintain predictable colour control

THE IMPORTANCE OF GREY balance and proportionality is nothing new, but prioritising press adjustments based on this concept is. As a consultant who installs high-end colour management workflows and delivers colour management training, and as a G7 expert who implements shop-wide G7 qualifications for all print processes, I am amazed that some industry experts are still in doubt about 'grey balanced printing'.

I work with companies that print screen, offset, web, flexo and large format digital, often all within one plant and often using all of their print processes to meet the needs of only one graphics kit – or they use different presses to attempt to match one part to another. This is a reasonable expectation of a workflow when many types of equipment and workflows have been invested in. The key to making all of these processes appear similar and to a contracted industry standard proof, is neutrality through the entire grey scale.

When highlight neutrals transition into shadow neutrals, equal neutrality occurs. When images print correctly in some areas and incorrectly in others, there is an imbalance within the grey scale. It doesn't matter if red apples or green grass are being printed, there is a component of grey and if it is out of balance, everything else is too. In other words if a print has a colour casted grey scale, you are not printing accurately to the file.

GREY BALANCE
A friend once told me: "I cannot visually guarantee you are compliant to ISO, or any other print standard, when you are grey balanced, but I can guarantee you are not compliant without grey balance." Grey balance is the foundation of colour – every process colour image has an inherent blended amount of grey – indeed, every process colour has a blended amount of grey, and every ink colour has some component of other colours.

The grey component begins within each individual colour and accumulatively builds to grey as non-proportional ratios to one another. Understanding this ratio is critical to attaining quick make-ready and maintaining accurate neutrality. Grey balance press control can be elusive and frustrating for press operators if not adjusted for in the correct sequence. For example, if printing to grey balance and a press adjustment is made in the wrong sequence, valuable press time is wasted because more colours will be inadvertently adjusted than was intended, and more than once.

This article aims to increase profitability in production by describing how to decrease make-ready time and increase run-time through prioritised MCY press adjustments in order to achieve neutral colour faster and maintain predictable colour control. Prioritising to MCY press adjustments is a new concept and a continuation of my research on predictable single colour progressive build to grey.

AN ANALOGY
Grey balanced press control is like chess: prioritising which process colour to adjust first is what I refer to as 'the King, Queen, Pawn rule of printing'. In chess, mobility of the piece equates to rank and power and like chess, inks have a rank. Grey balance is definitely the king, magenta is the queen because it has the most mobility, and cyan is similar to a rook or bishop. (Cyan has a slight amount of yellow with a little more magenta component ratio – not as neutral a mobile effect as magenta, but definitely more than yellow.) Yellow is the pawn as it has a perceived lack of power.

A press adjustment made to yellow only, has no effect on the neutral component ratio so if you need yellow and add it, you only get yellow. This is because the grey component of yellow is the lowest of the CMY combination. Cyan and magenta grey component ratios disturb the neutral balance with every move. Yellow is the easiest neutral ratio concept to understand because it has a minimal amount of magenta or cyan component, and as yellow has the smallest amount of component ratio it would quickly turn green, red or orange.

The misconception here is that yellow is simply weak. It has been said that you cannot see a 5-10% yellow dot by itself, however it is the lack of yellow that can cast a print to the bluish side, sending press operators on a quest to fix blue. In this case, more yellow would neutralise the image and realign the chroma; hue changes colour, chroma just makes a colour more saturated.

With a pre-2007 industry standard density of 1.4, magenta contains a component ratio of about half yellow and about one-third cyan. Magenta has the largest components of all three colours – Figure 1 shows these component relationships.
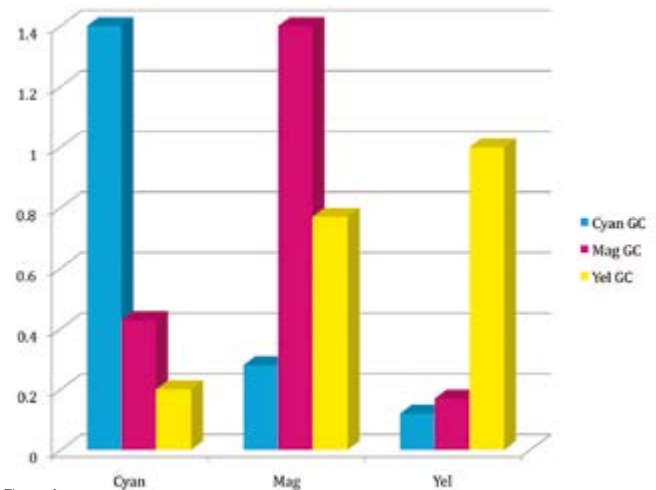
Figure 1

THE ARGUMENT
Some people have the misconception that grey balance only controls neutral density, not colour reproduction. This is wrong – all colours have a component ratio amount of grey, which is sometimes referred to as contamination. This portion of colour, at the point to which they have equal amounts, is the transition of the spectral response. An isolated colour to one particular tonal range, the 50% for instance, will cause a ripple effect that sends a wave of distorted colour out into chroma. This distortion does not stop until it reaches the edge of gamut, which is the primary CMY colours, combined overprints or secondary RGBs, the substrate and the black point. (An imbalance in saturated hues, such as apples, is not as easily discernible in areas lacking chroma, such as pavement, or achromatic areas.)
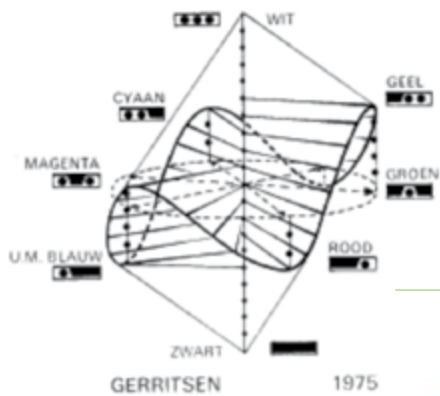
Figure 2: gamut edge of sample

GERRITSEN 1975
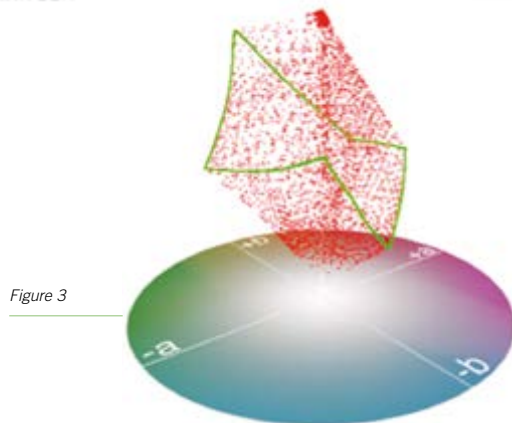
Figure 3

THE HISTORY OF GREY

In 1967, before dot gain and density became a popular means of press control, JAC Yule wrote: "In photomechanical reproduction, [ ] neutral reproduction of neutral greys is required." However the industry in general, and colleges as well, used solid ink density and dot gain alone as the primary means of print quality control for at least two decades.

Finally, ISO supplied 12647-2 to the industry which defines grey balance as "neutral". I am not aware of anyone who has ever written about or used the component ratio as a means of prioritised press control. This is not to say a press can be adjusted to neutral without first having been set to a known condition through plates, screens or transforms – this has to be done meticulously for the overall process to work. If the press has been calibrated to meet a qualification, prioritised adjustments can then be used to get back to that condition, or at least to neutralise the mid-point.

The grey ramp cannot always be linearised through press adjustments alone; adjustments can be made to attain balance at various aim points. For example, if printing flesh tones and having to choose, the 50% mid-tone would be the best control point. If the press has been calibrated, press-compensated or profiled using colour transforms to linearise the grey ramp, adjustments can be made to the mid-point 50% grey which realign the grey scale to a repeatable calibrated condition.

PROCESS PARTICIPATION

As a manufacturing process, printing must have the most variables to control because it has the most variables that can be out of control. Unlike other manufacturing processes, printing has had many process improvement advances such as 'prioritised press control' that are not categorised as 'lean'. For example, a 2009 survey conducted by RSM McGladery showed that all manufacturing processes, except printing, increased participation 'going lean' from 2008 to 2009. Printing & Publishing reported a decline from 55% in 2008 to 51%, and a recent USA Today advertisement boasted that ink was "the most expensive liquid on the planet".

Printing is an expensive process that will need future efficiency improvements that far outweigh the benefits of lean. G7, if implemented only in a simplified realistic version, is a process improvement that can help significantly.
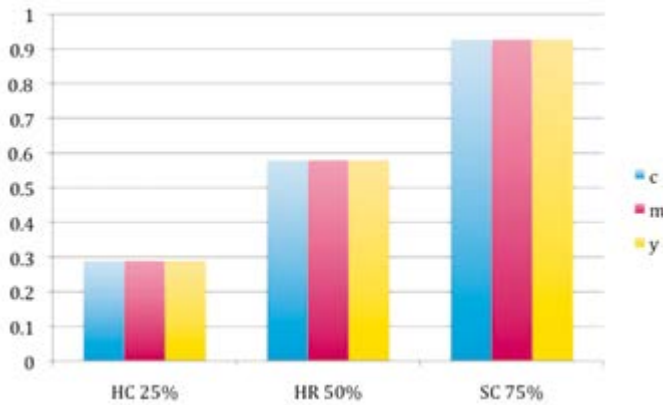
Figure 4

Figure 5: the ideal 'neutral' aim
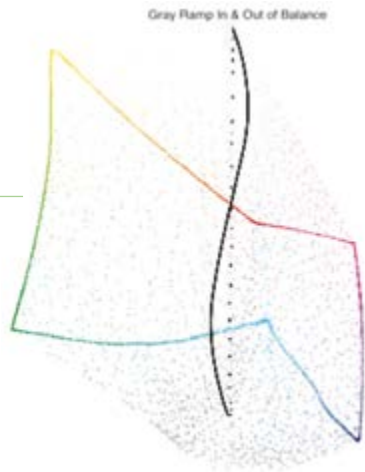
Figure 6
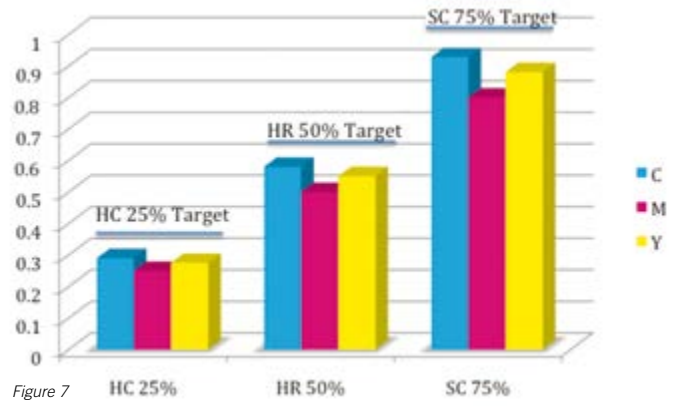
Figure 7

EXAMPLE 1

The G7 HR 50% grey patch is built into the file with a 50% cyan, 40% magenta and 40% yellow build. If aiming for a density weight value of .59 in the HR, which ideally would be .59c, .59m and .59y with a high / low and spread tolerance between each colour of no more than .04 in the HR, all that is needed is a densitometer for a control device.

Tolerances are not currently defined in density, by any standard, but testing by Nazdar Consulting has shown .03, .04 and .05 respectively to be reasonable spread tolerances from highlight to shadow. On press it uses three grey patches to monitor the grey scale: these are the HC, HR & SC, 25%, 50% and 75% builds of grey. Figure 4 shows no spread between CM or Y and is within +or- .04 of the target .58. This would pass for G7 compliance.

It should be remembered that neutrality imbalance is usually a ramp from the shadow end to the shoulder or an 'S' shape, not a tilted 'straight line' axis as in most illustrations. The reason for this is that the paper is fixed and the black point doesn't change much, so if you are within tolerance in the HR, as shown in Figure 5, you may still be failing in the highlight and or shadow.

In Figure 6 the HR crosses through the grey ramp at the 50% and
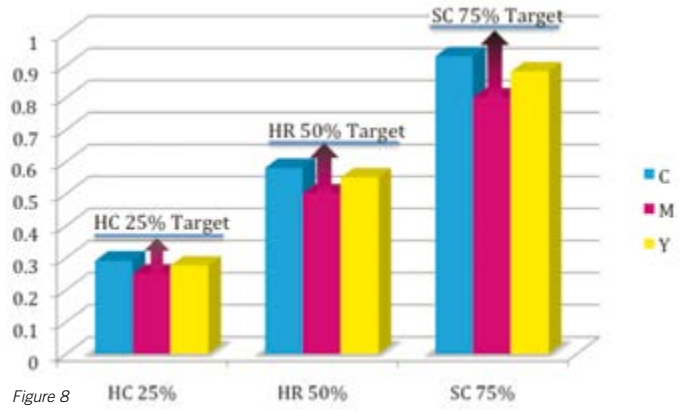
Figure 8

fails in the 25% and 75%, and in opposite directions. This example would produce a green highlight, grey mid-tone and red casted shadow. When all three aim points are out of tolerance and there is no alternative but to pick one, pick the 50% HR. The HR is the mid-point for the press operator; if it is correctly balanced and the HC and / or SC are out, you only need corrected compensation curves or new transforms.

Some printing processes and presses have more latitude to move this spread. For example, if you really push the press, can you move the magenta spread 10 points? If so, then you can pull the press 10 points when needed. Knowing this beforehand is critical, and documenting the effects of each variable is just as important. Assuming you can pull your press 10 points, you have the following spread in grey balance in the 50% HR (and see figure 7):

	HR		HR		HR
C	.57	M	.50	Y	.55

This would not pass: the grey balance is ramped out of balance to the green side, or lacks magenta. The density spread between CMY is .07 and the density weight value is too low. This can be fixed with one move: when the magenta unit, not ink, is adjusted, everything else is fine.

Because the cyan component is one-third cyan and half yellow, the grey component fixes itself. If all three units were adjusted at the same time because they all appeared to be low, you would over-shoot the target. Adjusting the magenta, aware of its inherent cyan yellow components, pulls the grey balance to neutral based on the component ratios of the inks.

EXAMPLE 2

Not every situation is this easy. For example, if we were aiming for a weight value of .6 and the component was:

	HR		HR		HR
C	.57	M	.50	Y	.60

Figure 9

This would require two press moves (see figures 7 and 8). The magenta has to come up, which will bring up the grey component for cyan and yellow. In this case magenta will fix the cyan and both will equal .6. As the yellow, however, is half the magenta component, it will be too high and climb to .65, requiring an additional move of reducing yellow.

EXAMPLE 3

In another example, if the cyan and magenta densities are .59 and the yellow spread is .10 points low, you will have a blue cast. Incorrect press adjustments are often made for this due to a visual assessment seeing blue. When correcting the imbalance, yellow has minimal components of cyan and yellow so when the yellow is adjusted up to .6, CM will move no more than .01 and stay within tolerance.

If you see a casted greyscale, it is either:
• Red cast = too much magenta and yellow or lack of cyan

Figure 10

Figure 11

- Green cast = too much cyan and yellow or lack of magenta
- Blue cast = too much cyan and magenta or lack of yellow.

There are several ways to qualify grey balance: you can measure L*c*h*, L*a*b* or density 'All'. Most pressrooms have densitometers that measure density only and not L*c*h or L*a*b. Figures 10, 11 and 12 show what grey balance looks like from the same sample, moving the display from one measurement space to another.

L*c*h* is the easiest to understand – the closer it is to 0 c* or no chroma, the more neutral it is. L*c*h* is derived from L*a*b* but is displayed as a single number derived from two co-ordinates. L*a*b* can be more confusing because 0 a* and 0 b* are the Cartesian

co-ordinate for neutral. Knowing which colour resides in which quadrant will give you a cast, but not necessarily indicate what to do on press. Density 'All' shows a spread of .02 when the chroma is less than 1; this is the easiest and quickest way to attain neutral grey with equipment you may already have.

CONCLUSION

After reading this article, I hope you are remembering whether you have ever made changes to a single colour based on knowing its collateral effect on grey balance. If you have ever moved one colour more than once and then began doubting grey balance, this article should help explain why. I believe this is worthwhile information for the advance of printing as a manufacturing process. ∎

Tim Quinn is Chromatix Consultant for Nazdar Consulting Services

The author would like to thank George Pavolack, Mike Edwards, Jason Childress and Miller Zell for their help with this article.

Figure 12

THE POTENTIAL OF DIGITAL PRINTING

Monica Cingolani argues that digital printing has nothing to fear from the global economic crisis as continued growth is predicted in this sector

SOME IMPORTANT MARKET STUDIES have been clear that digital printing will grow faster in the coming years thanks to its versatility and its reduction in 'lead-time' to the market. This is a winning combination which represents one of the critical factors for success for any company.

CONSUMER TRENDS

Market demand dominates business. Trendwatching, a leading US market research company, has published a report on the 10 crucial consumer trends in 2010 which will influence the production of goods. It is easy to see why digital printing will be a future star, judging by some of the trends indicated by this company:

- The Urbany: this is the ever-increasing population tendency to move from the rural areas to the urban cities. This trend leads to the evolution of consumers, who become more sophisticated, refined and demanding due to their access to more choice and variety.
- Luxury: The new luxury will be far from the concept of being expensive and will be built on a new concept of uniqueness, sobriety and exclusivity.
- Eco-choice: ecology becomes a key driver in choice. Living an eco lifestyle will be a choice – for example, by choosing recycled packaging and therefore reducing pollutants – which gives preference to brands with a tradition of developing eco-compatible production processes.

VARIABLES WHICH MEET DEMAND

This is a demand based on the equation solved by digital technology which performs in all printing market segments, from signage to interior decoration, from textile to indoor and outdoor up to graphic solutions. Digital printing assures a short lead-time to market, fast and cheap production even with limited volumes, and repeatability of results according to the trends indicated by Trendwatching.

Digistar Signy interprets the modern concept of solvent digital ink and confirms Kiian's ongoing commitment to developing products that respect workers' safety and environment in accordance with the 10 crucial consumer trends in 2010. It belongs to the class of eco-solvent inks that show powerful performance. Its name recalls the market segments for which it has been designed and tested for a long time: advertising, visual communication, signage and car decoration.

MAKING THE DIFFERENCE

Digistar Signy has a range of technical features which give it many advantages:

- High reliability: a basic feature which preserves the plotter mechanism and reduces operating costs
- Outstanding printability: a feature that optimises the printing process and fully exploit the plotter's capacities
- Gloss finish and bright colours: obtained thanks to a painstaking selection of pigments to achieve high image definition
- Excellent mechanical resistance: comparable to those offered by the best eco-solvent inks
- Good chemical resistance: among the best in the category of eco-solvent digital inks
- No risk labelling: a feature which makes the difference through a reduction of waste disposal, easier product handling and a tangible reduction of waste disposal costs
- Phthalate-free: it complies with the most restrictive international rules in terms of worker safety and environmental impact.

THE RANGE

Digistar Signy is designed for 4-colour process: cyan, magenta, yellow and black, and two light colours: light cyan and light magenta, which are crucial to achieving soft tones. All the colours in the range are available in ink bottles (1 litre capacity) and ink cartridges (440 cc capacity). ∎

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PAD PRINTING 101: BACK TO BASICS

In the second part of his article, Sigi Knappik examines the importance of clichés and inks in the pad printing process

IN THE WORLD OF pad printers, a cliché is a printing plate. In this part of the article I will discuss what a cliché is, how it is made and its importance in this overview of pad printing basics. Clichés or printing plates are available in two basic groups: steel and polymer.

Different varieties exist within each group and are used for pad printing based on production requirements. While the materials used are different among the varieties, all cliché materials share one common feature: they are etched through a photo-etch process. This process requires an artwork in the form of a film positive containing the intended print image.

ARTWORK

In the photo-etch process, the development of the artwork is the first critical step. The artwork is first created and then converted into a film positive containing the image, full size, right-reading emulsion side down (RRED). Placing the image emulsion side down during exposure allows direct image contact between the film emulsion and cliché surface.

The purpose of the emulsion is to block light during exposure so that the underlying, sensitised plate material remains soft. The surface exposed to light hardens and will resist the etch process. It is very important that the emulsion is 100% opaque to block light transfer – film that is not fully opaque allows light to leak through it which unintentionally hardens the etch area, resulting in insufficient etch depth.

STEEL CLICHÉS

Experienced product decorators who are familiar with the pad printing process know that the clarity and definition of the print produced is a direct result of the quality of the cliché. When compared to other plate materials, it is generally agreed that the steel cliché produces the best print quality, due to a number of characteristics.

Trans Tech uses a steel material that is designed specifically for the pad printing process. The proprietary method of hardening the material is designed to provide a high level of durability. Cliché durability relates directly to good print quality and is the result of four factors: chemical make-up, flatness, hardness and surface finish.

Trans Tech's steel clichés contain a high level of chrome and carbon; both elements provide durability. Once formed and machined to size, the cliché material is precision-ground for flatness and then hardened through a proprietary process to increase durability. It is then lapped to a surface finish of five microinches (.005 mil). During the print cycle a flat, smooth surface promotes good doctoring (removal of ink from the cliché surface). If the surface is rough or warped, a shadowing of ink occurs which can result in unwanted distribution of ink onto the part's surface.

EXPOSURE AND DEVELOPING

When the fabrication of the raw material is completed, the plate is ready for the exposure process; the process used to expose steel clichés is not easily adaptable to a customer's production facility, due to the chemicals used and expertise needed. The blank cliché is first coated with a photosensitive resist solution; the thickness of this coating is critical and is applied with specialised equipment. Once dried, the film positive is placed onto the coated surface of the cliché, exposed with ultraviolet light and then developed.

The developing process removes the photosensitive emulsion that was not hardened during exposure. An acid resist is then painted onto the cliché surface. Although the photosensitive emulsion contains acid-resistant properties, pinholes can occur due to dust contamination. The procedure of applying an additional acid resist minimises this potential.

The painting process is a critical quality step to ensure the elimination of pinholes in the cliché surface. Trans Tech's cliché technicians use a microscope to inspect each cliché manufactured to be sure that the cliché surface will be intact and void of pinholes. When painting is completed, the cliché is put through a tightly controlled acid etch process.

Continued over

The SLD Special Lapping Disk Kit for proper lapping of ink cup doctor rings

ETCH DEPTH

The amount of ink that is deposited onto the part's surface is unique to pad printing, and is a direct result of the cliché etch depth. For example, the standard etch depth for machines that use the open inkwell technology is 25 microns (.001 inch). Depth applies specifically to open inkwell technology; due to the need for allowing solvent evaporation within the ink, the speed of the machine has a direct correlation with the depth of etch.

Machines that use sealed ink cup technology tend to offer higher rates of speed due to their design. In these instances, cliché etch depth may be adjusted to 20 microns. In the rotary gravure process, where the steel drum rotates at speeds of up to 100 rpm, the etch depth may drop to 16 microns.

Steel clichés are available in two versions: solid steel and steel foil. A solid steel cliché is ten millimetres thick and is intended for use in long run production operations, giving a life of up to 1,000,000 cycles. The .015-inch thick steel foil cliché shares many design characteristics with the solid steel cliché and is capable of a production life of up to 100,000 cycles. Both the steel and steel foil cliché are developed through the same etch process.

Steel clichés typically offer the best print image for a number of reasons: the material allows a solid etch depth, a halftone screen is not needed unless special circumstances exist, the solid etch allows a uniform coverage of ink without any dot pattern, and the durability of the material provides long runs without surface deterioration.

POLYMER CLICHÉS

Polymer clichés, also known as plastic plates, are the second cliché group. Trans Tech has three different varieties that are easy to make at a customer's facility; each variety differs slightly from its counterpart and all are intended for short or temporary production runs.

The first and most popular is the alcohol-washout polymer cliché which is red in colour, capable of a production life of up to 50,000 cycles and composed of an emulsion joined onto a metal backing. This emulsion is .0075-inch deep and requires a special etching process to give proper etch depth. The material is actually exposed twice – first with the intended artwork and then with a halftone film. If the etch process was to occur immediately after the first exposure, the still-soft underlying material would etch down to the metal backing – at a depth of .0075-inch, the image would be seven times too deep.

The second exposure uses a halftone film that is used to control etch depth and contains a series of dots; a 300-line, 85% halftone film equates to 300 dots per square inch, where 85% refers to the tint (opaque area) of the film and the amount of area available for light to transmit through. In this case 85% of the film is opaque, allowing only 15% light transfer. The higher the level of tint, the more the area that is protected from the light, resulting in a larger area of soft material. The larger area of soft material is etched away, therefore a higher level of tint results in greater ink lay-down.

Line screen film may also be used for large, bold images. The dot pattern that is created in the image by incorporating the line screen film in the etch process acts to support the doctor blade as it travels over the open area of ink. An improperly supported blade will dip into the image and drag ink out. Halftone films are not limited to polymer clichés, but may be used in all the types discussed in this article, including steel.

WATER-WASHOUT CLICHÉ

The water-washout hydro-foil cliché is designed for production runs of up to 10,000 cycles. Its emulsion is softer than its polymer counterpart and has a thickness of .015-inch. This thickness requires a two-stage exposure process: artwork and halftone film.

Trans Tech's Express-3 water-washout cliché has a life expectancy of 10,000 cycles. It is more expensive than the hydro-foil, but is easier to produce. Unlike the hydro-foil and polymer, the Express-3 needs only one exposure. The emulsion is .001-inch and the etch depth is controlled by this design feature. Using halftone film to control depth is unnecessary.

The cliché plate plays a very important role in the pad printing process, however there are a number of considerations when determining the correct cliché type to use – the quality of desired prints, combined with the quantity of production required, are the major concerns.

PAD PRINTING INKS

The inks that we know and use today are specifically designed for the pad printing process. Although a full line of inks is available for printing onto different substrates, all pad printing inks share two common traits: they are solvent-based and contain a special pigment density.

INK VISCOSITY

Unlike other decorative processes, ink viscosity plays a crucial role in the image transfer process. Most manufacturers recommend a ratio of 15-20% of solvent to ink by weight, with the ratio adjustable to environmental conditions. It is the evaporation of the solvent that creates ink tackiness, which allows the image transfer to occur. Without the creation of tack, the transfer pad would be unable to properly function – the ink would either be too wet or too dry, preventing complete image transfer.

Often seasonal changes will affect the actual ratio used. For example, the solvent may flash quicker in winter months, due to the dry air, than in summer when the air is full of moisture. Most printing problems that are reported in the summer relate directly to high levels of heat or humidity. To minimise the effects of weather or other environmental factors, printing in an air conditioned area is recommended.

Water-based pad printing inks have never been successful due to their inability to create sufficient tack within the cycle time of the machine – conventional solvents are much faster and better suited to the process.
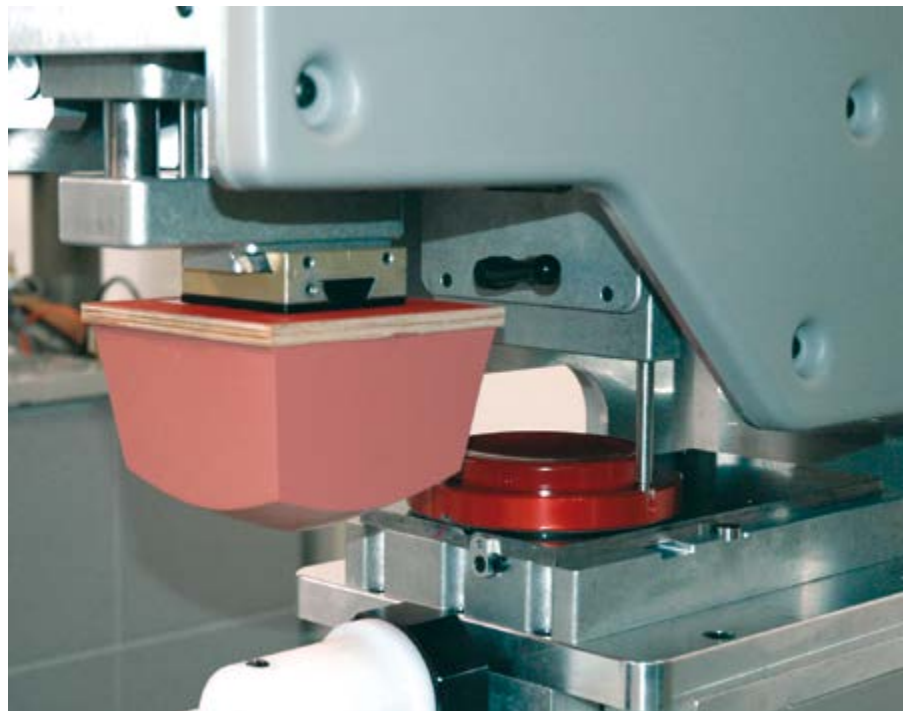
The Aero 130 pad printer

An ink chart showing the typical base colours available

THE INK FLASHING PROCESS

To fully understand pad printing, it is helpful to know how the ink interacts with the other components of pad, cliché and machine. The initial stage of each pad printing cycle begins with the cliché immersed in ink. As the cycle begins, the doctor blade or ink cup cleans the cliché surface and leaves the ink in the image exposed to the air.

When exposed to the air, the solvent in the top half of the image begins to evaporate or 'flash off' and becomes tacky. The transfer pad then compresses onto the cliché image and draws the ink from the etch. The portion of ink that was located at the bottom of the etch is now exposed to air for the first time. As this occurs, the solvent on the bottom half begins to evaporate and the tack process is complete. The image is now ready to transfer.

There are two important conclusions to draw from this description. Firstly, the speed in which solvent evaporates plays a critical role in the process; if the solvent does not evaporate, complete image transfer cannot occur. Secondly, ink cohesion is crucial in order to entirely remove the ink deposited in the etch. This is the main reason that etch depths rarely exceed 25 microns. It is possible to etch steel or other materials deeper, however the ink will not remain as a cohesive unit but will separate, resulting in an incomplete image transfer.

PIGMENT OPACITY

As mentioned earlier, the etch depth of a standard cliché is 25 microns or the equivalent of .001 inch. From this depth, a layer of ink approximately .0008 of an inch thick is transferred to the part. To maintain good image opacity, the pigment in the ink must be small enough to avoid removal in the plate doctoring cycle.

If you have ever tried pad printing with a screen printing ink and experienced 'see-through' or distorted colour (for instance, a yellow image on black appears greenish), then poor opacity is the reason. Pigments in screen printing inks are typically not milled to the fine density required to achieve proper opacity for the pad printing process. By contrast, in the screen printing process, opacity is gained through the thickness of ink applied.

PAD PRINTING MACHINE CONSIDERATIONS

Machines do not affect ink as much as they affect solvent evaporation. A typical open ink well machine with a cycle rate of 1000 parts per hour will affect solvent evaporation differently than a machine that uses a sealed ink cup that runs at a rate of up to 3600 parts per hour. It can be assumed that the open inkwell machine will require more operator involvement to maintain ink viscosity because the solvent is continuously evaporating. In a closed cup system, the ink and solvent are encapsulated, retarding evaporation.

Speed is another consideration. A machine with a faster cycle rate will not allow as much time for the solvent to evaporate as a machine with a slower cycle rate, which could result in incomplete image transfer due to the lack of time required to create the proper tack. To counter this phenomenon, solvents are available that provide different evaporation rates. A fast evaporating thinner should be used on fast cycling machines, for example.
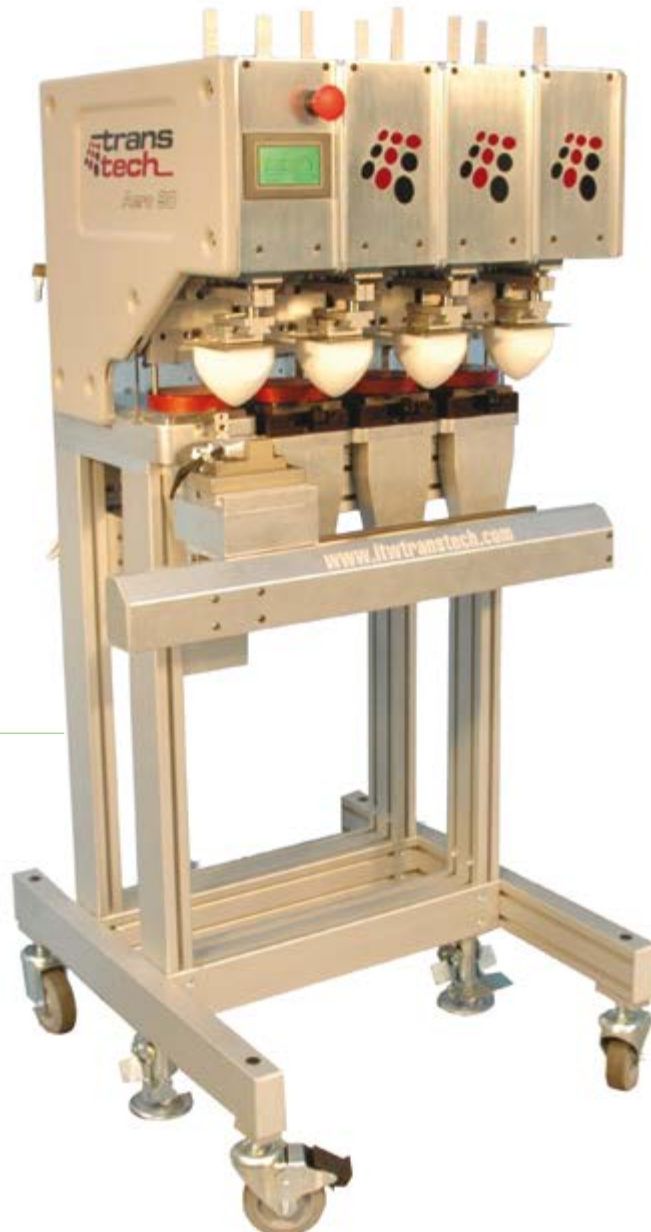
The Aero 90 4-colour pad printer

The Trans Tech facility in the USA

SINGLE AND TWO-COMPONENT INKS

Pad printing inks are available in two basic formats: single-component and two-component. Two-component inks have hardener as the second component. The task of choosing between the two formats depends upon the requirements of the image and the substrate being printed upon. Single-component ink has the benefit of extended pot life; it is often left in the machine overnight or in preparation for the next work shift. A heat cure is often not necessary because the single-component ink will cure at ambient temperature in 24-48 hours. Although they are easier to use, single-component inks do not provide the same level of resistance to mechanical abrasion or solvents as their two-component counterparts.

Two-component ink is better suited to applications that require a specified performance. The addition of hardener allows the ink to resist mechanical abrasion and most solvents; it is also necessary to give two-component ink a heat cure. The level of cure roughly corresponds to the amount of heat applied – a general rule of thumb is 350˚F (176.6°C) for 15 seconds to two minutes, depending upon the application.

Generally the higher the heat, the better the cure applies. The limiting factor in most applications is the melt temperature of the material, since most pigments will remain stable up to 650˚F (343.3°C). Two-component ink will cure at ambient temperature in 5-7 days, but if the goal is to maximise performance, a heat cure is recommended.

CURE VERSUS DRY

It is important to note the difference between the terms 'dry' and 'cure' as they have two different meanings: 'dry' simply means dry to the touch and does not imply that ink is cured, while 'curing' means that an ink has undergone a chemical reaction and its physical structure has reached a maximum level of performance.

ADHESION

It is a common misconception that the solvent in the ink is the component that promotes adhesion to the substrate surface. This is not true – the solvent does serve to soften the surface, but the ability to adhere to the surface is strictly a trait of the ink's chemistry. Earlier I said that the amount of ink transfer is .0008 inch; it is also important to note that once the ink is fully cured, the thickness is reduced to approximately .0004 inch – the loss or difference is from solvent evaporation.

Various inks are formulated to allow adhesion to different substrates – the ink used to print on polycarbonate may be different from one that is used to print on styrene. An ink's ability to adhere to the substrate is a product of two factors: the ability of the ink to cross-link with the intended substrate, and surface tension. When an ink is properly matched to a substrate, a chemical cross-link occurs that promotes adhesion. However in the case of some plastics, the second factor of surface tension becomes problematic.

Surface tension, measured in dynes per centimetre, can be described as the 'wettability' of a substrate surface. Materials such as polyolefins that have low surface tension do not allow the chemical cross-link to occur. In these instances pre-treatment is required, adding cost to the decorating operation in terms of equipment and labour. Unfortunately very few inks are available that allow good adhesion to these surfaces without a pre-treatment process. ∎

This is the second of three parts of this article; to subscribe to future issues of Specialist Printing Worldwide, go to www.specialistprinting.com or see page 50

Sigi Knappik is New Business Development Manager for Trans Tech

A display of ink cups and hold down rings

GLOBAL ACCESS TO MODERN UV INK SYSTEMS

Michael Lackner asserts that UV ink systems are complex and only a few may be suitable for use in real production systems

UV INKJET INKS HAVE lately paved the way to new fields of application: this is due to the advantages of quick drying through exposure to UV rays, the variety of suitable supports and lower environmental impact. Taking a close look, the ink formulas seem simple or look like simple mixtures of pigments, dispersion and surface-active agents, initiators and cross-linkable components (such as acrylate). In addition, thanks to generous sizing specifications, in theory modern piezoelectric printheads put no limitations on the ink-chemicals expert, so the number of stably printing UV inks should increase exponentially.

There has been a significant increase in the number of UV ink systems on the market, but even though their measurable ink parameters all meet the requisites of printhead manufacturers, only a small fraction of these inks are suitable for use in real production conditions and print stably without jamming nozzles and adequately adhere to the support etc. Since the reasons behind this are very complex, the purpose of this article is to illustrate, on the basis of crucial physical and chemical parameters, the complexity of optimised ink systems.

DEPARTURE SITUATION

Every ink assessment starts from certain general conditions, meaning that usually the support and printhead are predefined. When searching for adequate ink systems you will find numerous operators respecting all the requisites of the respective printhead maker. However after sampling individual inks, only a few suitable candidates remain: those whose development is not based just on printhead manufacturer indications (viscosity range and surface tension).

VISCOSITY

The most frequently discussed ink parameter is viscosity. This temperature-dependent factor plays an important role in formulating new inks and in guaranteeing the quality of existing systems. In addition, together with other parameters, it is an indication of drop formation and the stability of nozzles in actual printing processes. Sometimes even the deformation speed of certain inks plays an important role and clearly influences the stability of the printing process. In the narrow channels of a printhead, high deformation speeds can create

completely 'new' ink characteristics that, for example, can clog the nozzles.

Figure 1 shows the influence of viscosity on nozzle stability in high-speed printing (printing temperature: 42°C). Both the inks tested had temperature-dependent viscosities within printhead requirements but only the densest ink (the blue curve) provided stable printing at high speeds without jamming the nozzles. For the more fluid ink (red curve) there was significant clogging (above 50%) when printing speed was high. Precision adjustment of viscosity was able to prevent this.

STATIC AND DYNAMIC SURFACE TENSION

The surface tension of an ink formula is at least as important as its viscosity. Even if most printhead makers indicate only static surface tensions (that is, a balanced state of total orientation of the ink's surface-active agents), this parameter is most suited for measurements guaranteeing quality in existing ink systems.

Much more important in developing and optimising UV inks for high-speed printing is dynamic surface tension (non-total orientation of the ink's surface-active agents in the microsecond timing of the printing process), which can vary a lot from one UV ink to another, even in the presence of static surface tension itself. Non-optimised static and dynamic surface tensions can jam the nozzles (by

'de-wetting' the printheads or clogging the nozzle plate) or prevent the ink from adhering sufficiently to the support.

DEGASSING BEHAVIOUR

Even inks' degassing behaviour is an important dimension in the context of developing and optimising UV inks. Ink systems with too much gas affinity tend to form bubbles in the nozzle area, which can persistently clog. Considerable optimisation has to be given to the ink, both to reduce to a minimum its general gas absorption and to guarantee effective degassing through the printer's system.

FOAM FORMATION

Especially in systems with mobile printheads, foam formation with UV inks is a factor to be considered. Only a targeted selection of surface-active agents, optimised on the basis of other ink components, provide reliable use of UV inks with mobile printhead systems. This can be resolved by adding large amounts of anti-foam, but this reduces adherence to the support because it has been bathed.

UV–HARDENING BEHAVIOUR

The hardening of UV inks depends on printer-maker specifications. Leaving aside various UV lamp systems with variable lamp performance, the phenomena of light diffusion
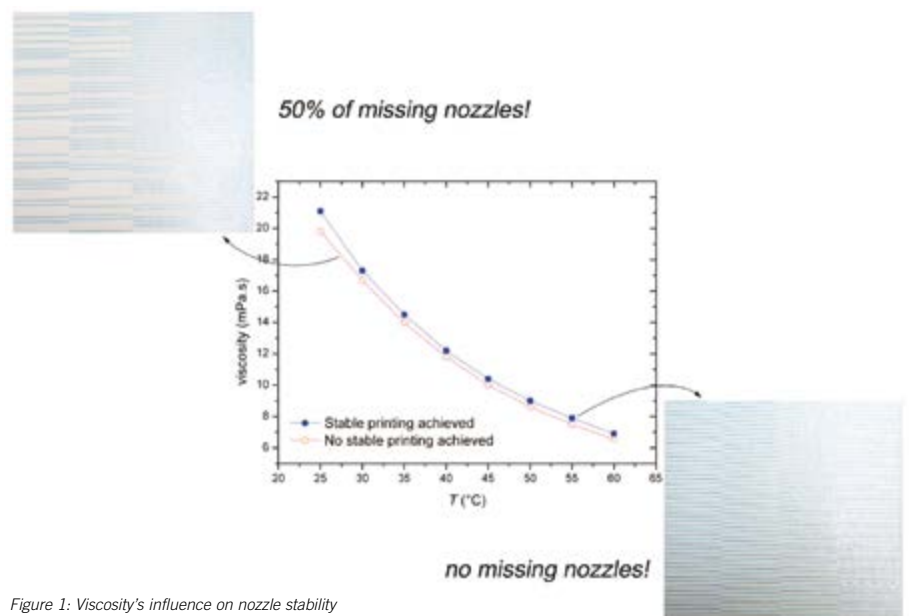
Figure 1: Viscosity's influence on nozzle stability

Figure 2: A print nozzle under an optical microscope

Figure 3: The optimal shape of the start-up impulse

etc. must be considered when formulating the ink. As a consequence, UV ink must permit total hardening through UV irradiation in the printer, while a reflection of UV light on the support must not provoke any irreversible obstruction of the printheads. This very important parameter, which can be controlled by choosing the type and concentration of initiators, must be suited to the general conditions of its respective printer and cannot be applied at will to printers from other makers.

Figure 2 shows a print nozzle under an optical microscope. Because the UV hardening characteristic of the UV ink was not adjusted to printer conditions (for example, diffused light), crusts formed on the nozzle. After brief oblique radiation, a total occlusion of the nozzle was revealed.

START-UP IMPULSE AND DROP FORMATION

A peculiarity of UV ink is the shape of the printhead start-up impulse. To guarantee excellent print quality this parameter has to be optimised for each ink to ensure perfect drop formation through the printhead. If start-up impulse shape is not optimised it often leads to 'satellite formation', or ink drops with sprays finely distributed on the support.

Figure 3 shows the optimal shape of the start-up impulse, fine-tuned on the basis of other ink parameters, which is an important premise for satisfactory printing results. The result of a non-optimised start-up impulse shape (satellite formation) is shown on the left, and on the right the result is shown for the same ink after optimising this parameter.

ADHERENCE TO THE SUBSTRATUM

An important criterion for the practical use of a UV ink is its adherence to numerous supports. This parameter depends on bathing behaviour adjusted to the support, and the ink components that dilate and react also play decisive roles. While the dilating parts slightly roughen the support, the reacting components of the ink develop chemical bonds with the support itself. The fine-tuned combination of ink components cited here can cover a broad spectrum of supports, making for versatile ink applications.
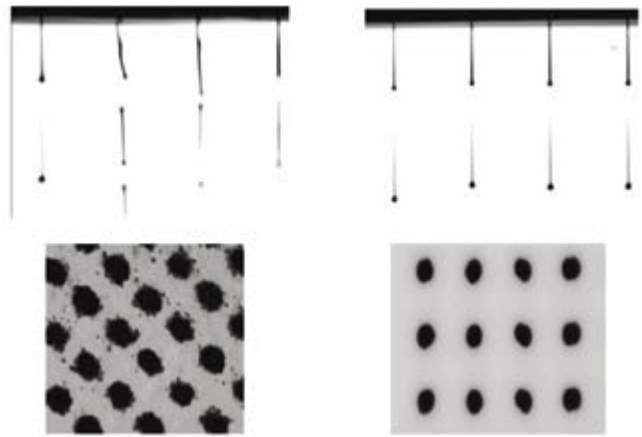
CONCLUSION

As illustrated in the examples given, formulating a UV ink offering stable printing is a complex undertaking. Only optimisation of the cited parameters and many others (density, shape and size of the particles, sedimentation etc.) in relation to particular requirements for the printhead, substratum and whole printing system can guarantee a high quality, stable printing process.

Here lies the weak point of many ink systems on the market: they are optimised for use with a given printhead but do not take into account specific aspects of the support (adherence, wetting behaviour etc.) or the peculiarities of a complex printing system (printhead movement, UV hardening behaviour, degassing behaviour etc.). The UV inks from Durst and some other suppliers are different from some other systems in their approach to optimisation, giving excellent printing and adherence characteristics – an indispensable combination for premium printers. ■

This article was first published in the Durst Process newsletter

Michael Lackner is Marketing Manager at Durst

Gerber's Solara ion cationic UV flatbed printer in use

PRINTING DIRECTLY ONTO DIFFICULT SUBSTRATES

Lisa Walsh outlines the benefits to sign-makers of using cationic UV inks as an alternative to solvent and other free-radical inks

SIGN SHOPS CAN ONLY succeed in today's market if they have an edge over the competition; they need durable signs that are reasonably priced. One of the biggest obstacles is finding an affordable printer that offers flexible, durable ink. While solvent inks are widely used in the marketplace, there are inherent problems with them.

The core issue is that solvent inks do not adhere well to non-porous surfaces, and this eliminates a huge array of durable, economic substrates for businesses that want to compete in the exterior sign market. "The ink flakes off and won't stay on the substrate," says Chris Ray of Budget Signs (USA), for instance. "We printed thousands of signs that went into the real world and they all came back. Some signs came back in three months, some in six months, and some are still coming back today."

Unfortunately, this is not an unusual occurrence. In order to get the durability they desire, most shops have to print on vinyl, cut and trim the image, then adhere it to the desired substrate. Solvents require up to 24 hours to complete the curing process before the vinyl can be applied to the substrate, meaning lost revenue and decreased profit for the sign-maker.

CATIONIC INKS

Cationic inks are a good alternative to solvent and other free-radical inks. While solvent inks need heat to expedite the evaporation of chemicals to complete the printing process,

An exterior sign created with a cationic UV flatbed printer

cationic inks are cured with exposure to ultraviolet (UV) light and cure almost instantly with limited drying time. This allows cationic inks to adhere directly to a wide variety of materials, including those sensitive to heat

such as Fome-Cor, Coroplast, paper and corrugated cardboard. This eliminates the need to print on vinyl, trim the image and then adhere it to the substrate, which reduces production time and cost.

Cationic inks are also preferable to traditional free-radical UV inks because once exposed to UV rays, the cationic reaction will continue until the inks are completely cured, even after the UV rays are turned off. The curing process for free-radical UV ink begins with exposure to UV rays, but when the inks are exposed to oxygen, the process stops. As cationic inks continue to cure even after they are no longer being exposed to UV light, their cure is always complete. This produces a more durable, flexible ink bond to the material, resulting in a longer image life.

Many printer manufacturers have tried to produce cationic inks for inkjet printers but have had only marginal success. Gerber Scientific Products has developed GerberCAT cationic UV inks, a set of four colour inks that are extremely elastic and durable. They work hand-in-hand with the Cold Fire Cure process, which cures the GerberCAT inks at nearly room temperature. Gerber offers both of these technologies in its Solara ion UV flatbed printer, a reasonably priced entry-level flatbed printer that can be upgraded with higher print resolution and other options as a business grows.

DIRECT PRINTING
Owners of cationic flatbed printers love their machines because they

Detail of an exterior sign created with a cationic UV flatbed printer

can print directly onto the substrates that solvent and free radical printers cannot, saving labour and material costs. These machines also provide durability and flexibility, solving the problem of finding a reasonably-priced flatbed printer that uses cationic UV technology.

"We saw samples printed on the Gerber Solara ion at a sign show, and we were happy with how well the ink held up," Ray continues. "We tested jobs by printing on Coroplast, which had given us the most trouble with our old printer. We printed the jobs and left them outside in water. After they were exposed to the air and water for up to two days, we rubbed them in alcohol, abraded them and still couldn't scratch off the ink."

"With the inks from our old printer, once we flexed the material, the seal between the substrate and the ink was destroyed, and the ink would literally break off in big chunks," he adds. "Our old

printer claimed their signs could be used outside, but that wasn't the case."

The development of cationic inks and low-temperature curing technology gives sign-makers the edge they need in today's market. With cationic flatbed printers, they can continue to thrive in the current economy for years to come. ■

Lisa Walsh is Consultant for Gerber

FINISHING AS A PROFIT CENTRE

Johnny Shell offers some advice to printers on up–selling expanded product offerings to customers

The author

"The best way to make money is to keep the inkjet printers running." This is a misleading but common notion in the wide-format printing industry. Often, print finishing is under-appreciated by print providers and money is left on the table. When presented alone, a print must stand on its own to achieve the desired effect when it reaches its final destination. The 'value' lies merely in its aesthetic appeal, however when the print is mounted and / or laminated, it transforms into an integral component of a larger setting. That notion is the credence many customers are looking for that also can be your ticket to higher margins. Providing finishing opportunities for a customer's product increases its perceived value. When finishing is viewed as a necessary evil, the potential for business growth diminishes.

Many businesses believe that finishing is an essential last step effort to protect the inks before the prints are sent to the customer. Yes, this is an important reason for laminating images, but it should not be viewed as the only reason. There are many different types of over-laminates and mounting adhesives that allow expanded product offerings to customers. Make your customers aware of the wide variety of options available to them and train your sales staff to offer solutions, not prints, to catch the eye of the target market audience.

To accomplish this, you need to expand the finishing options that you offer your customers and you must also educate them on their available options, otherwise they continue to think there are only a few options available. Customers may request that their prints be finished using a 2-mil gloss simply because they do not know what the best option is for their product – it is the salesperson's job to educate customers so they know what other options are available to them.

FINISHING SOLUTIONS

Show your customers what you can do by putting sample packets together showcasing some of your more exceptional finishing techniques. Showing your customers what is possible, and charging appropriately, will transform your finishing department into a rewarding profit centre for your business. The key is to know what your capabilities are with regard to your machine and finishing options in order to expand your current finishing options.

There are several finishing solutions on the market to suit the unique needs of print providers – the real trick is to pick a solution that will make business growth possible. Constant attention must be given to efficiencies in order for a business to grow. While it is important to buy the right digital printer, buying the right finishing option is just as important.

So, what are your options? There are many types of laminators and laminating films. Laminators range from roll laminators to liquid laminators. Film laminates range from pressure-sensitive (cold) to heat-activated (thermal and heatset) with base films made up of PVC vinyl, polyester (PET), polypropylene (OPP), polycarbonate and others. Here is a brief overview of laminators, laminates and cutting / routing devices.

LAMINATORS

Wide-format laminators are generally considered to be any machine wider than about 60 cm, although some 'desktop' machines may be as wide as 110 cm. Wide-format laminators usually feature heated rollers and additional feed / take up shafts. They are capable of mounting, single-sided lamination and single-pass encapsulation. Pressure-sensitive (cold roll) models are also available.

Heated roll laminators have one or more rollers that are heated for the purpose of applying thermal and heat-set films. Heated roll laminator models are available for a wide range of applications, including wide-format graphics, book-cover lamination, passport, ID and speciality products. Cold roll laminators are designed to apply pressure-sensitive or 'cold' over-laminate films and mounting adhesives. They are generally less expensive than heated roller laminators but offer less flexibility.

Pouch laminators are heat-aided machines that have greatly simplified the lamination process. As the name implies, a pouch laminator encapsulates an image, graphic or document on both sides with a thermal laminating film. They can also laminate and image while concurrently adhering it to a variety of substrates using a heat-set adhesive. The use of the pouch laminates minimises the set-up required when webbing a standard laminator. Although widely used for passports, printed documents and smaller graphics, larger format pouch machines are available.

Liquid laminating is a process of coating graphics with a wet clear coat. The resulting dry film offers benefits similar to conventional lamination. Liquid coating systems are available in a wide range of sizes, from credit card size processors to extremely large systems for outdoor graphics. UV curable systems are often used to speed the finishing process with instantaneous curing of the coating.

MOUNTING

Mounting adhesives are designed to mount a flexible media to rigid media. The most common adhesives are pressure-sensitive mounting adhesives and thermal mounting adhesives. Pressure-sensitive mounting adhesives are usually high-performance, relatively high-priced products. They have the advantage of not requiring a heated roller laminator for application and are usually recommended for more challenging applications such as face-mounting. Thermal mounting adhesives are usually classified by a processing temperature of over 205°F (96°C) as opposed to somewhat lower processing temperatures for 'heat assist' adhesives. Thermal adhesives are lower cost than other categories and are generally used for high-volume applications.

Overlaminate films are not only used to protect the print, but also add to the attractiveness of the finished print. They come in a very wide variety of finishes including the full range from high gloss to matte; they can also be embossed with a pattern, available in graffiti-resistant coatings, or be metalised for a unique special effect. There are several common rigid materials used to mount a

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printed graphic to give it rigidity and durability. Among the choices, Foamboard is a commonly used lightweight board from 3-19 mm thick. They are constructed using a Styrene foam centre with clay-coated paper or plastic surface liners that are available in a variety of finishes. The thickness of the surface liner is as important as the foam density in terms of overall board density. Foamboard is compatible with most adhesives, but is not water-resistant (except those with plastic surface liners) and also has a tendency to warp when used for single-sided mounting jobs.

Gatorfoam is the leading brand of heavy-duty foam core boards. It is made from extruded polystyrene foam board that is bonded between two layers of wood-fibre veneer. In general, Gatorfoam is water-resistant, a bit tougher and more warp-resistant than foamboard, but the edges chip easily when a bang or bump occurs. Sintra is Alcan's brand name of moderately expanded PVC sheets, which are available in thicknesses from 1-10 mm. This substrate is all plastic with a nice matte finish for upscale mounting jobs. However expanded PVC boards are porous, and therefore not waterproof. They can also freeze and become brittle outdoors.

Clear acrylic and polycarbonate plastic panels are available in thicknesses from 1.5-12 mm. They are generally used for backlight applications where the graphic is face-mounted to the substrate. Polystyrene is a thin lightweight sheet that is flexible and inexpensive. It is best used for transit graphics, outdoor signs and when curves are introduced as part of the installation requirements. Coroplast is the brand name for fluted polypropylene board. It looks like plastic corrugated paper and is rather inexpensive, however the surface is not smooth and the material is tough to cut.

CONTOUR CUTTING

Some of the most popular tools that are being used by finishing departments are cutting and routing systems which enable contour cutting of rigid graphics. These systems are equipped with optical sensors that align and adjust the cut path to pre-printed targets so the image is cut to contour no matter how it was placed on the cutting bed – there's just something about the way a contour-cut display looks when compared to a dull rectangle.

With so many options, it's easy to find yourself in a world of trouble when you laminate a print with the wrong film. A general rule of thumb is to match the composition of the laminate to the composition of the printed piece – polypropylene over polypropylene, vinyl over vinyl etc. Because each of these materials behave differently under different weather conditions, it's important to ensure compatibility between them. Each will expand and contract differently, which can be a disaster if they are mixed.

The same holds true when considering cast versus calendered vinyl films. There are two flavours of vinyl and you need to know which is which. Cast film is made from a liquid mixture that is then poured (cast) into forms on a moving web. The web passes through a heated environment to drive off solvents and produce a thin, highly durable, dimensionally stable material. Cast film is made from quality materials and is often referred to as 'premium' film as the cost is higher. Calendered film is made from molten vinyl that is passed through a series of rollers until the desired thickness is reached. Calendered films cost less but are also less dimensionally stable and are less conformable than cast. The simple rule of thumb is to use cast laminates over cast print media and calendered laminates over calendered media.

There is a wide range of finishing technologies that can be used to transform a printed piece into a finished product. Laminating and mounting can be used to protect and enhance the appearance of a graphic but can also be used to up-sell customers. Today's most successful print providers differentiate themselves from the competition by offering the benefits of total finishing solutions to their customers. From trade exhibits to outdoor signage and fine art to business documents, the wide-format industry benefits from print finishing technology. Finishing the job improves the performance of the product, and can make a positive difference to your bottom line. ■

Johnny Shell is Vice President, Technical Services of SGIA

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DIGITAL CUTTING – CAN YOU AFFORD NOT TO INVEST IN IT?

Lars Bendixen outlines the benefits to printers and their customers of the correct use of a digital cutting system

DOES ANY PART OF the following sound like it could be your print shop?

"Finishing our digital prints is a manual process. It often uses more than one person using rulers and knives, and when we are busy we very often outsource this aspect of the job. Human error sometimes creeps in and jobs have to be re-printed, which in turn can jeopardise delivery deadlines. As our volume of digital printing is increasing we find that cutting and trimming is becoming our bottleneck. We keep a large stock of different sized pre-cut sheets to meet different jobs and often need to trim larger sheets down, as our inventory is never correct. We never mix different jobs on one print run or print full width with multiple copies of the same job. We try to cut to size before printing."

If so, then read on.

If you are running your digital press(es) at a reasonable capacity level, how do you measure this? Do you look at the percentage of production hours in a day or do you actually calculate the area printed versus the potential if the full width of the bed is used? You should be doing the latter. It is very difficult to get an efficient loading of your press if you print one job at a time and do not nest compatible jobs together on large sheets using the full width of the press.

BENEFITS OF DIGITAL CUTTING

Prepare-it and RIP software from companies such as Caldera, Ergosoft and Colorgate is available to help you maximise the use of your printer. Studies show that digital cutting, as the above process is known, will give an opportunity to print an extra 46% (see Figure 1), which reflects only printing time, not loading and unloading. However this is not the only gain – it will also allow longer print runs which minimise operator interventions (see Figure 2).

Once you have increased your press efficiency by improved production planning and better material use by nesting jobs together on one sheet, you will find that manual cutting becomes a significant bottleneck. This becomes even more of an issue as deadlines become shorter, volumes increase and employees working under pressure make more mistakes, increasing costs due to the need for re-prints. You then have to outsource the cutting, and by doing this you lose control. Relying on outside vendors ultimately creates more problems

Zund's Cut Center uses data from a rip to cut workflow, enabling Zund's G3 cutter to automatically cut printed graphics

and gives away a great profit-making opportunity.

The more work is moved around, the greater the chances of the sheet being damaged and the longer the job will take. Outsourcing takes longer than doing the work in-house and means having to quote longer delivery times, making you less competitive. You will also be giving away a chance to make excellent margins on the finishing work – many printers outsource the finishing as often as possible, but many shops have embraced the latest technology to allow them to run at maximum efficiency and to take the high margins associated with finishing into their own businesses.

Late stage digital cutting

Example of increased printer productivity

– reflect only printing time (not loading and unloading)
– apply to mounted prints as well as direct printed

Total printing time One by One: 24,5 hours
Total printing time Multiple Up: 16,7 hours
Total difference (saving): 7,8 hours

Figure 1

Late stage digital cutting

Example of labour reduction

– Longer print runs minimise operator interventions
– Example require only 10 interventions in stead of 30
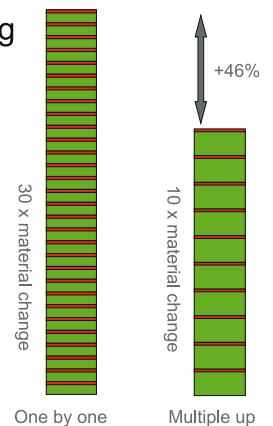
Figure 2

CUTTING SYSTEMS

Proper finishing starts before the job is printed; planning software and a digital cutting system are necessary to meet the need. Systems such as Zünd's digital cutting system with its new Cut Center front-end software will close the finishing gap. As printers are capable of printing onto a wider range of materials in both rolls and sheets, the digital cutting system needs a variety of different cutting tools and material handling options. These systems undertake simple tasks such as trimming a square banner and contour cutting 50 mm foam boards.

Although trimming prints to squares and rectangles is where the largest decrease in manual labour occurs, offerings to customers will be significantly increased with contour cut prints, which market research suggests can be extremely powerful compared to rectangular display boards. Adhesive labels / decals can be printed in large rolls or sheets that are then face cut and die cut into smaller sheets that are ready for use.

Initially most printers choose a cutting system that is big enough and has only the cutting tools needed for their normal workload; they often overlook how the cutter's software will integrate into their workflow and may need to expand the system as demand grows. The advice is to buy larger than you think you need – if there is spare capacity in the early days, sell it by offering a service to other printers. You should also select a system which can have additional cutting tools and material-handling devices added to it. A typical cutting system lifespan will usually exceed 15 years, so think ahead.

RIP TO CUT WORKFLOW

Digital cutting does not need to be a complicated process with the proper system. The artwork being printed, which was probably designed in software such as Photoshop, Illustrator, InDesign or Quark Express, can be used to create a simple 'print and cut' workflow, where the print file and die file are manually created in pre-press.

This can be further optimised when the production planning software communicates with the cutting system's front-end software, which is generally referred to as the 'rip to cut' workflow. This is where a job is submitted to the RIP with or without predefined cut paths. The RIP will look for embedded cut paths and / or create one from the bounding box of the image, and will then nest or group together multiple copies of a job or other jobs waiting to be printed together to make the best possible use of the material.

Registration marks and barcodes are then added to the new layout and print data is sent to the printer. The cutting data is saved to the network as the die file, which is later retrieved by reading the barcode at the cutting system. The die file can include other job details such as priority, due date and the material printed onto. These job details are then used by Zünd's Cut Center to completely automate how Zünd's cutting system will finish the job.

A successful implementation of digital cutting starts with a full range of training and support to integrate the cutting system into existing workflows. Remote and on-site services are available to solve problems and answer questions that may arise. Zünd's technical support group offers system maintenance and service and a spare parts

exchange programme covering all models that they have ever sold – 98% of Zünd's cutting systems are still in use in over 50 countries.

IN SUMMARY

Digital cutting has the following benefits:
- Additional capabilities and new applications such as contour cutting
- Consistent high quality, leading to better products
- Faster turnaround times
- Overall higher efficiency: ~46% more output with 33% less labour (increase production without increasing labour costs)
- Labour reduction for manual cutting, printing and mounting
- Reduced waste due to human error and poor material use (nesting)
- Reduced printing time (no need for re-prints)
- Less need for outsourcing, and other shops can outsource to you
- A flexible work-flow, pre / post cutting and easy template creation.

A German customer who moved to digital cutting and automated workflow found that his waste was reduced from approximately 10% to <1% while jobs previously handled by two persons now only require one, and trimming is completed five times faster. ■

Lars Bendixen is Product Manager for Zünd

GLASS DECORATION USING UV INKS

In the second part of her article, Diana Dogaru recommends digital printing for industrial applications
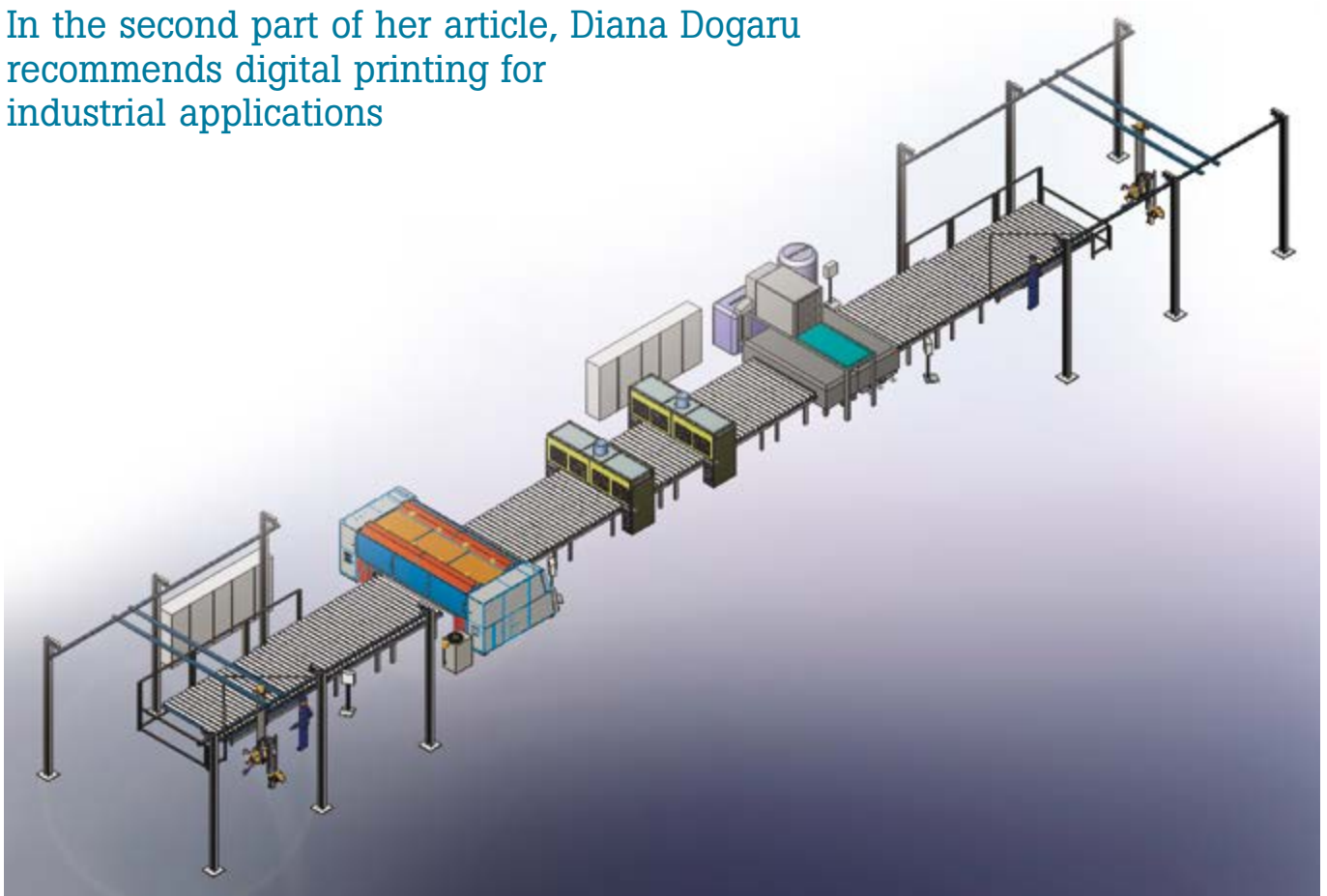
Figure 6: WP Digital's inline solution runs at optimal speeds with reproducible quality and strict specifications for high volume production

WITH ITS THIRD GENERATION of UV digital printers, WP Digital is introducing the RS combo platform to the industrial market together with the modular UV decorated glass cleaning and pre-treatment solution. The Virtu RS platform was designed using a sturdy steel frame with large UV protective windows to monitor the printing in progress whilst safeguarding the environment and the operator. The machines have a printing width of 2.5 or 3.5 m and can handle materials of up to 50 kg/m^2 and a thickness of 95 mm running 24 hours per day in an unattended environment.

The Virtu RS25 RS35 (30 pl) has a maximum addressable resolution of 1016 x 1200 dpi. The maximum apparent resolution is 900 dpi as advertised for the Dimatix Spectra SE-128 heads. Using the standard 4- or 6-colour UV printing process, the design on the glass panels can be reproduced very accurately. White is added as spot colour or as overprint or underprint.

The machines' ability to print materials in a greater width than the rigid table is made possible by the very accurate material feed system which advances in precise steps through the linear encoder measurements and movable bridge corrections. For customers printing on different substrates and in different sizes, an easy set up is provided with the offline solution of extendable feeding and taking off tables. This option allows printing glass panels of an unrestricted length.

The printing table is divided into longitudinal sections of vacuum zones of approximately 10 cm that can be opened and closed separately and independently by two vacuum pumps in weak and strong modes. The strength of the vacuum power is regulated from within the operating interface. The anti-static device removes the static charge at the level of the print during the printing sequence. It is attached to one or both sides of the head carriage, depending on the need.

The camera placed at the rear of the machine, inside the cover, has a monitor at the front loading position of the machine to see the unload area of the machine. An open operating interface allows the modification of key parameters in printing, and there are tools for studying the production speeds and output quality, and the real calculation of the ink consumption per printed job. The active queue system makes the Virtu machine easy to operate in long run production jobs.

DIFFERING PRODUCTION

A printing technology usually starts with sample production batches. These are then shown to the market, for example at trade shows, and once they have been accepted, much larger volumes start to be demanded. Larger volumes bring higher efficiencies and

Model	Max printing width	Number of print heads	Ink configuration	No of heads per colour	Apparent max resolution	Head type
Virtu RS 25/48	2.5 m	48	CMYK, lc, lm+white	6 heads / colour for CMYK, lc, lm and 12 heads for white	1016 x 1200 dpi	Dimatix Spectra 30 pl / 80 pl
Virtu RS 35/48	3.5 m	48	CMYK, lc, lm+white	6 heads / colour for CMYK, lc, lm and 12 heads for white	1016 x 1200 dpi	Dimatix Spectra 30 pl / 80 pl

Figure 7: Comparison of the Virtu RS25 and RS35 machines

reduced costs. It is very common for producers to move to an in-line solution giving even more efficiencies at this stage.

Glass printing comes in two categories: unique pieces of glass decoration and high volumes for architectural projects. The weight of glass is considerably higher than normal materials commonly used in UV printing, such as 2.5 kg/mm/m^2. A robust machine is needed to handle this type of material with precision.

The glass surface interacts with the UV ink in a controlled way following specialised surface cleaning and surface pre-treatment prior to printing. The printing process with UV inks is the last stage in the glass decoration process. The advantages of digital printing include the possibility of printing from one colour to multiple colours in one step. The advantage of UV ink in particular is that the ink is dried immediately during the printing process using ultraviolet light, so the printed glass is ready to be used straight off the printing table.

WP Digital is providing solutions for the big volumes that come with many glass printing projects. An inline solution for printing onto glass with UV inks is built according to necessity, with fully automatic components and processes such as washing and pre-treatment with consideration of printing quality and the printed product's properties.

DIGITAL PRINTING IS FLEXIBLE

Digital printing can simulate all natural colours from the environment. Using the digital input file, glass decoration can be changed to meet each person's design requirements in any colour. These range from traditional to modern structures such as marble, wooden or semi-finite designs in etched glass, or water surfaces in standard to customised decorations.

Images on glass are bearers of emotions and their message goes beyond the technical aspects of the printing process already discussed. WP Digital's technology support achieves these emotions in reliable repetitive colour gamuts using Barbieri Electronic's Spectro LFP RT spectrophotometer. This device measures the colours on a backlit or transparent media to give colour saturation.

CONCLUSION

Niche markets may become mainstream when dictated by economic change or environmental concerns. WP Digital entered the industrial market with its direct printing on glass solution using UV ink technology. The outcome of this experience is that industrial volume and industry-orientated production does not necessarily mean delivery of one machine that is finite, but a partnership in knowledge and machine adaptation or tailoring to customer needs to ensure that it fulfils the specific production purpose.

Differentiation, time to market the product for maximum benefit and the provision of local support are predominant factors for success. The inkjet industry with its diverse application potentials is moving fast. Market education and research continues in every branch of UV application, and by intelligent partnership with relevant producers and users, the Wifag Polytype group is ensuring the continuity and quality of the UV decorated output from small batch to mass production. ■

The first part of this article appeared in the last issue of Specialist Printing Worlwide; to subscribe go to www.specialistprinting.com or see page 50

Diana Dogaru is Business Development / Business Intelligence for WP Digital

Figure 1: The MPI6121 Street Graphics Film

TAKING IT TO THE STREETS

Paul Roba asserts that a new product will change the way you look at street graphics

TO TAKE OUTDOOR STREET graphics to a different level, a company looks to its creative engineers and steps outside the box with a new technology. Avery Dennison's Graphics and Reflective Products Division empowered a project team consisting of the Research & Development and Marketing groups and created the MPI6121 Street Graphics Film.

The team looked for a new medium to present street graphics. They were aware of the current PVC-based products on the market, which used established technology to create a decal to lie on top of the pavement and blacktop. This process uses base film, printed image and a clear textured laminate to create a final effect of a disconnected decal stuck on top of pavement.

Avery's team reviewed the available solutions and decided upon a change; the key question was: "How do we make the material appear more part of the base pavement, or blacktop, essentially creating a paint-like finish?" An answer was a thin film technology which adheres to the walkway, street or driveway and almost becomes like a paint film integrated onto the substrate.

FORMULATING A FILM

Work started to formulate a film product which could be imaged and then applied to the surface. Several iterations of polymer compounds were considered, and a review of the key elements, performance criteria and strong casting capabilities identified a candidate: a proprietary new film formulation was a viable alternative which could provide a solution to meet the key criteria of the project scope.

After several trials, iterations and modifications to the formula, the face film was successfully manufactured. This film can be easily imaged and provides a conformability which mimics paint when applied to cement, blacktop and stone. A major feature of the product is its ability to crack and create micro-fractures in the film (see Figure 2) which allows the film to conform to the irregular, rough surfaces of outdoor streets, sidewalks and driveways.

The change in fracture technology changed a street or sidewalk graphic from an incongruous decal into an integrated part of the substrate. Fracturing of the graphic allows moisture to run off or channel through the graphic, minimising slip concerns. This film provides up to six months durability for foot traffic areas, and up to three months when used in areas which primarily have automotive traffic, depending on the level of traffic over the graphics.

SECOND PHASE

A second phase in the development of the MPI6121 Street Graphics Film was combining it with an appropriate adhesive system. The adhesive needed to provide consistent contact to the outdoor surface, maintain the paint-like finish of the film and still have a degree of removability. A candidate was identified and selected from a range of solvent acrylic adhesive systems which were available. This selection met the needs of the project charter; final prototypes

Figure 3: An installation of the MPI6121 Street Graphics material has been installed for nearly six months

Figure 2: Close-up of the cracking and micro-fracturing of the product, allowing water to drain through or run off the graphics easily

were run and field-tested to great success.

The final product, printed and applied, provides a different type of graphic imaging and sidewalk decoration. A live UV-printed application which has been in place for over five months is shown in Figure 3. Although installed in front of a busy office, it still demonstrates the effectiveness and finish of the final product,

and provides a stable non-slip surface.

Converting the MPI6121 Street Graphics Film is easy, and the product can be printed on most UV digital printers. Finishing printed images can be completed as with any pressure-sensitive film. The product requires the use of a low tack application tape and should only be installed on clean and dry outdoor pavement.

IN SUMMARY

For a new way to create outdoor sidewalk, parking lot or street messages, promotions, advertising, temporary way-finding or other information or design, MPI6121 Street Graphics Film gives a memorable new look. It features:

- Patent-pending micro-fracture technology which enables the film to conform to very rough surfaces by fracturing and conforming
- Thin, 1.8 mil thick non-PVC film that minimises edge lift, reducing trip and slip hazards
- Durability for heavy traffic applications (up to three months under vehicle traffic and six months of foot traffic)
- Print performance that is ideally suited for digital UV-curable inks and receptive to solvent and eco-solvent inks
- Slip resistance that meets testing standards. ∎

Paul Roba is North American Technical Manager for the Graphic and Reflective Products Division of Avery Dennison

REVIEW OF THE SEVESO II DIRECTIVE

Elaine Campling explains the history and outlines the relevance of the Seveso II Directive, which is currently subject to review by EU Member States

ESMA
Driving Print Excellence

THE SEVESO II DIRECTIVE is currently subject to review by Member States of the European Union. The adoption of the original Seveso Directive was prompted by an accident at a chemical plant in Seveso, Italy in 1976, when significant quantities of tetrachlorodibenzoparadioxin (TCDD), or dioxin as it is more commonly known, were released as an unwanted by-product from a runaway chemical reaction, causing significant environmental contamination. More than 600 people were also evacuated following the incident, due to health concerns.

Council Directive 82/501/EEC was enacted in 1982 on the Major Accident Hazards of Certain Industrial Activities and became more commonly known as the Seveso Directive. Subsequent amendments to the Seveso Directive, largely to broaden its scope, followed in 1987 (87/216/EEC) and in 1988 (88/610/EEC) following further chemical escape.

CIRCUMSTANCES

A tragic chemical incident in Bhopal (India) in 1984 involving a leak of methyl isocyanate is reported to have led to the loss of thousands of human lives, and a warehouse fire in Basel (Switzerland) in 1986 resulted in extensive environmental pollution when fire-fighting water containing mercury and organo-phosphate pesticides polluted the River Rhine.

The Seveso II Directive on the Control of Major Accident Hazards was adopted in 1996 (96/82/EC). This complete revision included the addition of new named substances, changes to existing named substances and generic categories, including revised qualifying quantities and changes to the aggregation rule (see below).

Additional requirements were included relating to safety management systems and emergency planning, following analysis of major accidents within the European Community. Provision for information exchange and land use policy and planning was also a feature of the revision in an attempt to reduce the risk of 'domino effects' between neighbouring sites, and also the effects of a chemical accident on residential and ecological communities.

DETERMINING SCOPE

An establishment is in the scope of the Directive when substances are present in quantities equal to, or in excess of, the qualifying thresholds set out in Parts 1 and 2 of Annex I to the Directive. Part 1 is a list of named substances, and Part 2 is a list of generic hazard categories, following the existing European classification scheme for dangerous substances and preparations, the Dangerous Substances and Dangerous Preparations Directives.

There are two thresholds for each named substance and generic category: the lower tier and the top tier. The requirements for top tier sites are extensive and are reported to involve quite substantial cost to establishments with top tier status, particularly in Member States where Competent Authority charging systems are more expensive.

The requirements for top tier sites are reported to involve quite substantial costs

It is useful to note that a dangerous substance is defined by the Directive as "a substance, mixture or preparation" listed as a named substance or generic category "and present as a raw material, product, by-product, residue or intermediate" (92/82/EC).

The quantities to be considered are the maximum quantities present, or likely to be present, at any one time and understandably include the potential for chemicals to be produced during chemical reaction, whether planned or otherwise. In the case of substances or preparations falling within more than one hazard category, the lowest threshold is to be applied.

An establishment may still be in scope even if the thresholds are not reached for any named substance or individual generic category, due to a requirement to aggregate similar hazard categories.

Thus, for example, substances with a physical hazard classification are aggregated using a partial fraction calculation. This is performed by adding together the resultant values obtained from the division of the quantity of each category, divided by the threshold limit for that category. If the aggregate value is greater than 1, the establishment is in scope.

THE CURRENT REVISION

Directive 96/82/EC was further extended by Directive 2003/105/EC following further industrial accidents and studies relating to carcinogens. This is the current Directive under review by European Union (EU) Member States.

A revision to the Directive is now required due to changes in the EU system of classification with implementation of the Classification, Labelling and Packaging of Substances and Mixtures Regulation (EC No.1272/2008), the CLP Regulation implementing the UN GHS criteria.

In 2008 a Technical Working Group was established with the task of assessing the translation of the Seveso categories in Annex I Part 2 (generic categories) of the Directive to the new classification system.

Additional investigation to aid the review

A revision to the Directive is required due to changes in the EU system of classification

process includes a study to assess the effectiveness of the Directive, completed in 2008, which in part focused on the effectiveness of the implementation of the Directive within Member States and industrial sectors. The full report following the study can be accessed at: http://ec.europa.eu/environment/seveso/pdf/seveso_report.pdf A further study was conducted to examine the effectiveness of the main requirements imposed on public authorities.

PROPOSALS

Following these studies, some suggestions for the revision have been proposed, including integrating the lower and top tiers with the possibility of one single threshold value rather than the current lower tier and top tier limits. There is also a proposal to extend the requirement to produce a safety report to lower tier sites.

Lower tier sites are currently required to produce a Major Accident Prevention Policy (MAPP), but there is no requirement to produce a full safety report. This may be more worrying for establishments currently operating as lower tier sites in countries or regions where more expensive fees are charged by Competent Authorities for activities related to the Directive, such as the evaluation of safety reports. It seems that there is some variability in the charges imposed by Member States.

In the UK the Seveso Directive is implemented as the Control of Major Accident Hazards Regulations (COMAH) with responsibility shared jointly between the Health & Safety Executive and the Environment Agency, both of whom operate a charging system. Abolishing the tiers and extending the requirement to produce a safety report to lower tier sites will present additional burden and cost to UK establishments currently in scope with lower tier status.

Further differences in the way the Seveso II Directive has been implemented into national law within Member States have also been identified from the review process, including reports of national requirements going above and beyond the requirements of the Directive.

AN ORGANISATIONAL PERSPECTIVE

Some organisations are in scope due to the presence of substances in preparations and may not have any pure substances on site or conduct any manufacturing or processing activities. An anomaly with the current requirements is that an organisation may be out of scope with significant quantities of a pure substance on site but just below the qualifying threshold, whilst another organisation is in scope with smaller quantities of the substance present in product formulations due to classification limits for substances in preparations being exceeded.

There is also no pack size relaxation in the requirements, as permitted by other regulations such as limited quantity derogation within transport regulation. In this respect, the requirements of the Directive are not risk-based, relying only on whether qualifying thresholds are met.

For ink manufacturers and similar industries, the Dangerous to the Environment qualifying thresholds have been particularly problematic. The lower tier qualifying limit for toxic to aquatic organisms (R51/53) is 200 tonnes and 500 for top tier status and 100 lower tier / 200 tonnes top tier for very toxic (R50 including R50/53).

With some necessary ingredients of printing ink formulations classified as aquatic toxicants – that is Dangerous for the Environment – printing ink companies have fallen into scope, in part due to the substances on site, but also due to the production of their ink preparations, typically in 5 litre quantities.

To put this into perspective, the qualifying threshold for flammables is 5000 tonnes lower tier and 50,000 tonnes top tier. The control measures that a particular organisation may have implemented in these circumstances, such as bunding of storage areas to prevent environmental release, is not relevant – only the quantity on site is.

CONCLUSION

There is no doubt that it is vitally important to protect human health and the environment from the release of chemicals. However, in keeping with other health, safety and environmental legislation, a risk-based approach may be more relevant, especially since it is likely that many more substances and therefore preparations will be classified as hazardous under the CLP Regulation due to differences in classification criteria from the existing, but expiring, classification system.

Without a risk-based approach many more organisations may come into scope and lower tier sites may cross the top tier thresholds. Due consideration should be given to anomalies within the Directive and there should also be consistency of implementation and charging systems between Member States. For further information on the revision see: http://ec.europa.eu/environment/seveso/review.htm ∎

Elaine Campling is Chairman of ESMA's Health Safety and the Environmental Protection Committee and Product Safety Manager for Fujifilm Sericol

FOLLOWING A NEW PATH

Kaspar Widmer describes how a UV printer manufacturer decided upon and implemented a new strategy

The author

WP DIGITAL IS A Swiss manufacturer of large hybrid printing systems plus an extra large dedicated roll-to-roll printing machine. The company was formed by Spuhl, a subsidiary of Legget & Platt, and was recently acquired by the WIFAG-Polytype Group to be the digital catalyst for the printing group. WIFAG-Polytype is a Swiss-based group focusing on building and servicing diverse and complementary printing and converting machinery. WIFAG, based in Bern, manufactures rotary offset newspaper printers, Polytype makes dry offset decoration printers for cosmetic and food containers and plastic tubes, Polytype Converting manufactures coating and converting equipment for plastic, aluminium and paper compounds for the packaging industry, and Wifac is responsible for the trading of pre-press equipment, machinery and consumables for the printing industry. WP Digital was added to the group in November 2008.

To strengthen and support the development of new approaches to printing techniques in general and especially in the digital printing arena, the WIFAG-Polytype group is sponsoring the development of an institute for printing technologies at the University Of Applied Sciences Of Bern, focussing on various prototypes that integrate new digital technologies.

When it started in 1999 WP Digital was one of the pioneers in developing large format UV digital printing systems with its Virtu printer family. The RS25/35 hybrid models were launched in 2007, followed closely by the development of the RR50, a 5 metre dedicated roll-to-roll UV printing system which was launched in 2009.

A NEW STRATEGY

Last year, when digital printing technology was well established in the graphics industry, the pressure on prices for machinery, ink and substrates reached a high level; combined with the general cost level associated with UV printers and the global economic crisis, there was a risk that the market would not be willing to pay for these items despite the printing quality, versatility, reliability and productivity of UV printers.

Exploring new technologies and applications, such as direct printing onto glass or anodised aluminium, gives satisfaction and leads to new successful business models. As a result of WP Digital's new strategy the company decided to split activities into two divisions: graphics and industrial. To generate more presence in the graphics industry WP Digital offers scalable solutions that are suitable for prints in small batches or much larger volumes. Industrial applications require far more than just the printing system; WP Digital has the knowledge and understanding of industrial technologies and offers complete production line solutions, and is constantly developing new visions and proactively supporting niche markets.

INDUSTRIAL PROCESSES

The company's focus on the direct printing process onto glass was a crucial management decision. WP Digital is closely co-operating with strategic technology partners and plays a leading role in digital glass printing. As a consequence of going into the glass industry, WP Digital engaged a group of industry specialists to set up the Glass Inline Decoration System to fulfil industry requirements. The company's internal digital printing experts can serve glass manufacturers and processors with a powerful application and complete solution that differentiates itself in the market.

Close interaction with architects, designers and technology experts has become a success factor, resulting in the company being an active participant at relevant glass technology conferences and exhibitions. WP Digital's commitment starts with consulting in the early design phase, followed by the implementation of a customised glass decoration line accompanied by a full service package, education and training, consumable service and digital content (printing profiles, high resolution pictures, patterns).

THE TEAM AND VALUES

Entering specific industrial segments requires added values to the core business of printer manufacturing. The consequence is that internal skills are enriched and co-operations started. Software, material science, chemistry, physics, ink technology and process technology need to be adjusted to the new challenges. A proactive co-operation and technology partner management enable WP Digital to keep pace with the tough industry demands regarding time-to-market and costs.

The WP Digital team is organised in departments in the fields of printing technology, sales and machine servicing. Staff that specialise in project management, software, chemistry, physics, material chemistry and dedicated markets such as glass provide the skills that WP Digital is constantly developing. Key staff include Markus Schawalder, Chief Operations Officer (Deputy CEO), Ulrico Ettisberger, Head of Project Management Office, Andreas Huber, Global Service Manager, Andrea Quintel, Chief Technology Officer, and Nicolai Walkling, who recently joined as Chief of Marketing and Product Management.

The management team is supported by 50 employees. In July 2009 a new facility was opened in Mahwah, New Jersey, USA. The demonstration room in Mahwah has been fully equipped to follow US market demands and to provide a demonstration facility for the company's range of digital printing machines.

THE FUTURE

The company sales propositions in both divisions, graphics and industrial, are a combination of top quality and high performance printing systems, combined with a custom-made solution for various applications. Digital printers have a major role in the total process. WP Digital offers professional support beyond technology and is active in graphics and industrial segments. The synergies of both will boost technical solutions and lead the customer to success. ■

Kaspar Widmer is CEO of WP Digital

"OVERWHELMING RESPONSE" TO FESPA INDIA

FESPA's President, Anders Nilsson, opens FESPA India 2009

THE ORGANISERS OF FESPA India 2009, held in New Delhi in December last year, have declared the event a success and have praised the "overwhelming response" some exhibitors gave to it. FESPA and Services International thanked all exhibitors and visitors for their support and involvement, saying the exhibition had been rated as very successful in placing business platforms for the exhibitors and introducing technical advances and exposure of technologies to visitors.

Anders Nilsson, FESPA President (left), and Frazer Chesterman, FESPA Managing Director

Exhibitors reportedly expressed satisfaction at achieving sales objectives, customer relationship-building, market research, brand building and channel support, as well as being able to demonstrate their products and develop new markets. Companies also expressed satisfaction over the quality and quantity of the buyers that attended the show, according to the organisers.

Companies expressed satisfaction over the quality and quantity of buyers at the show

The FESPA Print Awards were held during the exhibition and around 30 participants took part in the competition by sending over 125 creative ideas from the large format screen, textile and digital printing industry. ∎

Further information:
web: www.fespaindia.com

SIGN & GRAPHIC IMAGING MIDDLE EAST 2010

25–27 January 2010; Dubai, UAE

THE 12TH ANNUAL SIGN and Graphic Imaging Middle East (SGI 2010) exhibition will take place at Dubai Airport Expo in January, with international and regional exhibitor registrations expected to match or surpass participation at last year's event.

Dedicated to the Middle East's signage, outdoor media, screen and digital printing industries, SGI is the largest and longest running show in the region. SGI 2010 will

showcase the latest products and emerging technologies from the advertising, architectural hardware, banners and posters, digital imaging, electronic message centres, electronic signage, graphic imaging, graphic services, large format printing and signage industries.

This will be the second year the show has been held at this venue, with more than 90% of exhibitors and visitors at last year's event citing the exclusivity of the venue,

ample parking, less traffic, proximity to the airport and availability of nearby hotels as reasons for preferring it. Exhibitors also cited the fact that Dubai Airport Expo attracted visitors only from the industry, so had a good number of serious and quality visitors. ∎

Further information:
web: www.signmiddleeast.com

ISA INTERNATIONAL SIGN EXPO 2010

7-10 April 2010; Orlando (FL), USA

THE INTERNATIONAL SIGN ASSOCIATION (ISA), the trade association for manu-facturers, suppliers and users of on-premise signs and sign products from the USA and other countries, is holding ISA Sign Expo 2010 at the Orange County Convention Center in Orlando (Florida), USA in April. Designated as the 85th largest tradeshow in the USA in 2009 by *Tradeshow Week*, Sign Expo 2010 will host sign industry professionals from the USA, as well as more than 100 countries outside of the USA –

approximately 20 per cent of exhibitors and 14 per cent of attendees are from outside the US, according to the organisers.

The ISA Sign Expo 2010 offers participants 60+ education sessions delivered by the International Sign Academy, including a full day of pre-conference workshops on 7 April covering topics such as graphics and design, vehicle wrap technology, sales, marketing, safety, management and more. All education session attendees will receive Professional Development Units (PDUs) from

the International Sign Academy, and Continuing Education Units (CEUs) are available for many sessions as well.

Sign Expo 2010 will also conduct a New Product Showcase competition, a Green Product Showcase, a vehicle wrap competition and more. Online registration is now open via the website. ∎

Further information:
web: www.signexpo.org

GLASSPRINT 2009 ATTRACTS INTERNATIONAL ATTENDANCE

THE GLASSPRINT 2009 CONFERENCE and exhibition was successfully staged in November; it presented the latest decoration trends and developments to the international audience that gathered in Germany.

More than 130 attendees were present including glassmakers, glass decorators and leading suppliers to the industry who displayed their equipment, consumables, technology and services in the table-top exhibition. Attendees travelled from 37 different countries – not only from throughout mainland Europe and the UK, but also from long distance destinations such as Brazil, Chile, China, India, Korea, Pakistan, Philippines, Sri Lanka and the USA.

PRESENTATIONS

The two-day conference programme presented delegates with 12 technical conference papers to offer the latest advanced technologies covering digital and screen technology for printing onto automotive, architectural and container glass.

In addition, a keynote address was given for both the flat and container sectors. Mike Young, a member of the Academy of Screen Printing Technology, presented his 'Top 5 secrets of screen printing flat glass' while for container glass, Adeline Farrelly, Secretary General at FEVE, asked: "How healthy is container glass?" – a subject which generated a healthy discussion in the question and answer session.

Technical experts working for various companies in the glass decoration sector then delivered the following presentations which demonstrated processes and ideas to add extra value to the end product:

- Digital glass decoration with organic sol-gel UV-inkjet *(Durst)*
- The whole package of decoration options available and their compatible nature *(Ferro)*
- Flexibility in screen and cost saving in stencil preparation *(Grünig)*
- Benefits of using servo-technology for screenprinting hollowware *(ISIMAT)*
- The benefits of Computer-to-Screen (CtS) technology for hollowware printing *(KIWO)*
- Organic inks for flat glass applications – today and tomorrow *(Marabu)*
- Digital printing on glass with sol-gel inks *(Munich University / Ormoprint)*

WHAT THE DELEGATES THOUGHT

Here are some comments from the major glass manufacturers who attended GlassPrint 2009:

"A very interesting and well organised event."
Liouris Dimosthenis, Guardian (Luxembourg)

"Once again, a very interesting meeting. Building relationships during these two days is one of the major reasons to participate."
Olivier Dangmann, O-I (France)

"Very interesting conference!"
Jean-Philippe Savary, Saint-Gobain (France)

"This was my second attendance at GlassPrint and I am looking forward to the next one."
Nissan Amir, OSG Oran Safety Glass (Israel)

- Addressing environmental concerns through the use of organic inks *(PPG / Ecobrite)*
- Print testing, performance and quality control *(RUCO)*
- New product range for large format glass decoration *(Sefar)*
- The very latest in large format Computer-to-Screen (CtS) technology for automotive and architectural flat glass printing applications *(SignTronic)*
- Step-by-step guide to adding value to glass by digital printing *(WP Digital)*.

The conference programme was supported by intervals dedicated to the accompanying tabletop exhibition and at the end of the first day, delegates benefited from networking with their peers and suppliers during an evening dinner.

If you were not present at GlassPrint 2009 and would like to view the complete presentations, they are available for download at a total cost of only €95 / £65 / $125 – please contact sales@glassworldwide.co.uk

SPONSORS AND ORGANISERS

GlassPrint was jointly organised by ESMA and Chameleon Business Media, publisher of *Glass Worldwide* and *Specialist Printing Worldwide*. In recognition of its importance in the global glass event calendar, GlassPrint 2009 was sponsored by glassglobal.com, SGCDpro, SGIA, Deutsche Glastechnische Gesellschaft (DGG) and L'Institut du Verre. After confirming its status as Europe's leading event for glass decoration, the organisers are already planning to repeat GlassPrint in 2011; details on the location and dates will appear in future issues of *Specialist Printing Worldwide*. The next issue (March / April 2010) of its sister journal, *Glass Worldwide*, will include the *Annual ESMA Glass Publication 2010*, a unique guide to glass decoration. To subscribe, visit www.glassworldwide.co.uk ∎

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Stephen Kahane, Chairman of NASMA, with Specialist Printing Worldwide's Frazer Campbell (left) and Bryan Collings (right)

AN INTERVIEW WITH STEPHEN KAHANE

As a new decade approached, *Specialist Printing Worldwide* took the opportunity to have a chat with the new NASMA Chairman

What does the role of NASMA Chairman mean to you?

I see my role as leading our executive committee in assuring that NASMA has clear direction, that the needs and interests of our members are met, and serving as a liaison to other affiliated organisations, such as ESMA. One of the real benefits of my position is the opportunity to interact on an ongoing basis with my fellow committee members, the NASMA membership, and our other industry peers.

How long do you expect to be Chairman for?

The NASMA Chairman serves a three year term, mine ends December 2012.

What do you feel were the main strengths that your predecessor, Parnell Thill, brought to NASMA during his time as Chairman?

Parnell brought a steady and collaborative leadership style to his role as NASMA Chairman. Parnell made many significant contributions to NASMA, as its Chairman and as one of its early and most active members. We all appreciate Parnell's hard work and commitment, and I look forward to continuing to work with him on our executive committee.

What would you like your legacy to be after your term as Chairman?

I'd like to be remembered for advancing the accomplishments of my predecessors and helping our group realise its potential in serving our members and our industry.

What are NASMA's primary goals?

Our primary goals are to provide our members with a forum to interact, learn and contribute, and help them better serve the North American specialty printing markets and customers.

What do you think are the primary benefits for manufacturers who are members of NASMA?

There are several. As an executive forum, NASMA provides an excellent networking opportunity for industry leaders and decision-makers. Our meetings are informal and structured to encourage interaction. Members have the opportunity to build business relationships, gain and expand market perspective, explore new market opportunities and learn more about and from peer companies. Through our business initiatives and roundtables, members gain timely, relevant market and business information unique to our industry.

How can these benefits assist members during recovery from the current economic situation?

Three things come to mind. First, I find a lot of value, particularly during these

challenging economic times, sitting down and talking with people I respect about the challenges we all face. It's a great way to gain insight and knowledge. Second, our business initiatives and surveys provide our members with valuable benchmarks, metrics and other information. And third, we regularly invite industry-leading printers to our meetings to get our customers' perspectives on how they see their businesses and how we can better serve them as suppliers.

How does it benefit customers to know that their suppliers are NASMA members?
I think Parnell said it best in your interview with him last year. Our customers can be assured that NASMA members have as their primary objective, a fundamental focus on how best to serve them.

Does NASMA have any plans for new projects in the next year?
We are shifting our business model in the coming year to one that better reflects who we are and the evolving needs of our organisation. We plan to operate less as an association and more as an executive forum. This will allow us to better capitalise on our still relatively small size and better serve the industry-leading executives who are our members.

NASMA is a partner of its European counterpart, ESMA. What are the benefits of this relationship to your members, to North American printers and to the industry on a global scale?
ESMA has provided NASMA with ongoing perspectives on the international market and on issues such as REACH that may be regional but impact us all. We also continue to benefit from lessons learned from ESMA's established experience.

Will NASMA ever follow ESMA's lead in organising technology conferences?
NASMA has no plans to organise conferences or trade shows.

What is NASMA's relationship with show organisers and national associations such as SGIA?
We enjoy excellent and collaborative relations with the major show organisers. Most NASMA members belong to other major trade associations such as SGIA, and actively participate in their trade shows and specialty conferences.

NASMA has sponsored *Specialist Printing Worldwide* for two years, which has significantly contributed to the
magazine becoming established as a leading reference source in North America. Would you comment on the benefits to members and end-users of this sponsorship of a magazine aimed at spreading technology for the good of the industry?
Specialist Printing Worldwide has done an excellent job presenting developments and opportunities in the international marketplace. The information in *Specialist Printing Worldwide* is very helpful in navigating our increasingly global economy.

In general, how do you see the current status of the American market and what is your forecast for the short, medium and long term?
The economic experts tell us that the recession is now behind us, and that the North American economy is starting to grow again. But I believe where we really are is at the bottom of a deep trough. The good news is that it doesn't appear the trough will deepen any further at this point – but it will be a slow climb out. The expectations seem to be that the economy will start to revive slowly towards the middle of 2010 and it will be several years before we are back to where we were before the recession. ■

Stephen W Kahane is Chairman of NASMA

IMPORTANT

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WHAT DOES THE MARKET BRING US IN 2010?

ESMA
Driving Print Excellence

IT HAS BECOME CLEAR that 2010 is still going to be a rough rollercoaster ride! If we believe the vision of the scientist Mark

Peter Buttiens

Buchanan, the world economy is in a critical state and can collapse at any time. We know, however, that such moments will also bring new opportunities. The winners will be those who not only have the right product innovation, but also the most efficient market positions and sales engine.

The message from the members is very clear: there is an important need to introduce new applications and business models, and also better production and quality to compete in the market. This concerns not only screen printing, but also digital inkjet printing, which is increasingly exploring industrial applications.

ESMA will try to help develop a platform for creating the right environment to explore new applications and markets. We reflected and confirmed that during GlassPrint 2009 in November last year – the number of digital participants showing new solutions made up an important part of the conference on applications for flat glass decoration. We are pleased that the GlassPrint conference proved to be such a success judging by the number of delegates and participants in such difficult times. It was extraordinary to see that we almost had a completely new audience and such a large number of presentations and exhibitors.

ESMA is preparing many new conferences in 2011 to explore new market opportunities. We intend to organise a high-tech printing conference (membrane, IMD and printing electronics for screen and digital printing), a digital textile printing conference (applications and productions) and an industrial inkjet conference.

ESMA will also allow its members to explore new industries by staging pavilions in different exhibitions, giving members an opportunity to discover new niche markets at low cost. ■

Peter Buttiens, CEO of ESMA

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US GRAPHIC IMAGERS FINDING GLOBAL OPPORTUNITIES

"SGIA is pleased to announce its sponsorship of Specialist Printing Worldwide and will be providing a regular column in each issue of the magazine to keep the global community abreast of what is happening in the specialty imaging industry in North America. We have always co-operated closely with Specialist Printing Worldwide and we look forward to this opportunity to share SGIA's perspective with the readership. It is an honour and a pleasure to sponsor this valuable information resource."
Michael Robertson, President / CEO of the SGIA

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JUST A FEW YEARS ago most US-based graphic imagers saw globalisation as a one-way street with graphic production going off-shore to the lowest bidder. Print buyers were attracted by low labour costs in China, India, Mexico and other countries.

But for some applications, print buyers have found that chasing the lowest production cost isn't always the best approach. They have discovered that production costs are only part of the equation.

Some of the production work that went off-shore has returned to the US as graphic imagers add value by helping print buyers effectively manage a rapidly changing marketplace and maximise business development opportunities.

However, now there is a new twist to the story. A wide range of US-based businesses are taking advantage of new opportunities to expand their businesses globally. Businesses that were once focused almost exclusively on the US domestic market are expanding into the global marketplace. According to Howard Silverblatt's annual S&P 500 Report, in 2008, US-based companies paid more foreign income tax than US tax. That's a first!

There are two major factors driving US businesses to develop global strategies: a growing global middle class – with purchasing power – and a weak dollar. An untapped market and a competitive edge are helping US-based businesses succeed in many other countries.

As the US market contracted during the recent recession, other countries garnered the attention of US companies. Many of the US-based businesses that branched out through a global marketplace are benefitting from the diversity.

As an example, consider the restaurant industry. Restaurants, especially fast-food chains, are major customers for graphic imagers. Burger King, McDonalds and Papa John's International are expanding faster outside the US than domestically. Kentucky Fried Chicken, Pizza Hut, Taco Bell and Long John Silver's anticipate that within the next decade 70 per cent of their profits will come from outside the USA.

The expansion of US-based businesses helps graphic imagers expand their reach, too. US-based graphic imagers are taking advantage of new opportunities to support the interests of their customers.

Most US-based graphic imagers have been reluctant to seek out international business on their own. Our survey findings indicate that 38.5 per cent of US-based graphic imagers are looking beyond the US border for customers. Most of their efforts have been focused in Canada and Latin America.

Only 50 per cent of those seeking international opportunities have business ventures in Europe. However, some graphic imagers are taking a big step towards developing international markets through the relationships they have with US-based companies going global.

These graphic imagers are increasing their value in the eyes of their customers by providing creative services, inventory management and distribution, project management, fulfilment and other important services.

The global recession provided an incentive for many US businesses to firm up their international development plans and start expansion. The success that many US-based companies are experiencing in the global marketplace will encourage others to follow.

Expect a steady increase in the number of US businesses exporting products or establishing business locations outside the USA. Their continued success will create new and exciting opportunities for graphic imagers. ∎