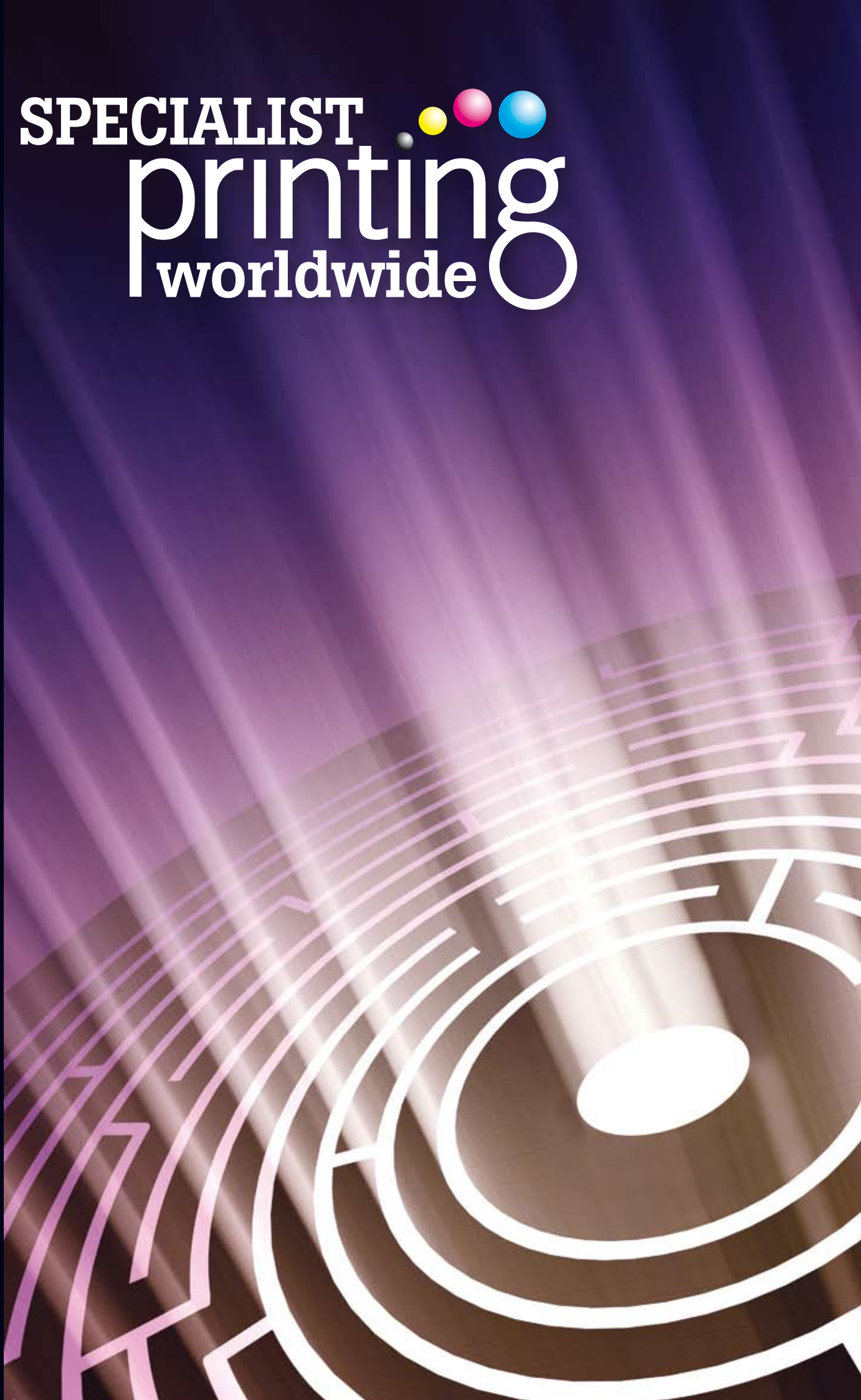
ISSUE 4
2009

GLOBAL TECHNOLOGY IN FOCUS

DIGITAL SCREEN AND PAD PRINTING

SPECIALIST printing worldwide



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MESSAGE FROM BRYAN COLLINGS

ON THE FRONT COVER OF THIS issue, you may have noticed our new logo. The addition of the word 'Worldwide' now reflects our recently expanded global readership of over 15,000 users of screen and wide-format digital printing systems. It also ties us in to the 'Worldwide' family which includes our sister journal, *Glass Worldwide*.

I was really pleased to see the green shoots of recovery reported in a recent FESPA survey (see page 4). It was also great to hear many positive stories from both printers and manufacturers at the recent SGIA '09 show.

As we prepare for 2010 with much anticipation, *Specialist Printing Worldwide* remains committed to bringing highly valuable technical information to an ever-widening international audience. If you have not yet subscribed, this is your free promotional copy; to receive all issues in 2010 for only €50 / $75 / £40, please visit www.specialistprinting.com/sub_form.htm or see page 15.

We have launched an online **Process Information Centre**, explained more fully on page 48. On the *Specialist Printing Worldwide* homepage (www.specialistprinting.com), you will now see companies sharing their technical expertise through the various sections of the new centre. Try clicking on one of the buttons to see what's available. Eventually there will be about 18 different categories of information covering most aspects of specialist printing.

Lastly, GlassPrint 2009, taking place in Darmstadt near Frankfurt (Germany) on 25-26 November, is fast approaching. I would urge you to register soonest at www.glassprint.org – I hope to see you there!

Bryan Collings, Publishing Director, *Specialist Printing Worldwide*

CONTENTS

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Survey shows positive upturn for printers

The results of FESPA's first stakeholder Economy Survey show that wide format printers and their suppliers around the world are broadly optimistic about the chances of business recovering to pre-recession levels within the next 12 months; 14% of respondents already report signs of recovery, with a further 23% expecting fortunes to improve in the second half of this year. The survey also shows that more than half expect the upturn next year.

The Economy Survey of 400 individuals during July 2009 was conducted by FESPA in partnership with research organisation InfoTrends. It questioned a sample of printers worldwide to assess how they are managing the impact of the global economic downturn; the majority had seen turnover affected. The survey also showed the strategies adopted to address the downturn: using lower priced media (35.2%), lower priced ink (28.7%) and cutting printer maintenance programmes (18.5%). However 46.3% of respondents had tightened their waste management practices and 22.2% of PSPs looked to flatbed printing technology to trim labour costs.

Around 40% of respondents gave rebates and price promotions to tackle the downturn, with almost a third using flexible payment terms as a means of attracting business. Around 24% of printers questioned have implemented fresh sales or marketing strategies, and 12.2% have expanded sales resources to cope with the downturn. ■

UK's first WS6000 is installed

Baker Self Adhesive Labels, a leading trade label printer based in London (UK), has installed the first HP Indigo WS6000 Digital Press in that country. The WS6000 can print at speeds of 30 m/min for four colours and twice that speed in two-colour mode. Driving the new press is an HP SmartStream for Labels and Packaging Print server, which includes a high performance RIP and hardware combination, integrated PDF support, Pantone colour conversion tables and a powerful step-and-repeat engine designed for labels and packaging applications. The WS6000 can handle a wide range of substrates from 12-450 microns and has seven-colour capability (CMYKOV plus white). ■

Closed loop leads to product developments

As part of Roland's closed loop (total solutions) system, the company offers its 'Roland DG Care' with service and maintenance contracts, a help desk, and training at the Roland Academy and the Creative Centers. The company also works on the development of reliable products that meet the needs of the market, including custom-made solutions.

Two recent developments are the VersaCAMM VPi and AdvancedJet AJi with Intelligent Pass Control (IPC) technology for higher print speeds without loss of quality. The AdvancedJet AJi is for larger and high-volume work and produces six-colour prints (CMYK+LcLm) with a maximum width of 2.6 metres, which are resistant to alcohol, scratching and water. The AdvancedJET i series is available in two models: the AJ-740i with a width of 74 inches (188 cm) and the AJ-1000i with a width of 104 inches (264 cm). The VersaCAMM VPi is an integrated printer/cutter which can print four-colour images and automatically cut contours. IPC is also available to previous purchasers for free download from the Roland website. ■

New generation of digital cutters launched

Zünd has launched G3, its new range of digital cutters which feature versatility, robust construction, modularity, user friendliness, ergonomics and energy efficiency. G3's modular concept means that all tools are engineered for each of the 10 models available, with upgrades such as camera registration capabilities or adapting to changes in production needs able to be performed at any time. The G3 is equally well suited for cutting, creasing, scoring or routing, and simple shapes or complex contours. A new V-Cut tool can cut rigid materials up 16 mm (5/8 inch) thick at various angles from 0° to 45°, so it can create 3-dimensional displays from dense sandwich board or honeycomb materials. A high-resolution ICC camera attaches to the tool carriage. Zünd also offers a 2-year warranty with the base G3 machine. ■

There are 10 models available for the G3

European launch of dual platen white ink direct-to-garment printer

The GT-782 inkjet garment printer

Having recently started shipping the GT-782, its newest direct-to-garment digital inkjet garment printer, to North America, Brother plans to release it to the European market this winter. The Brother GT-782 is an inkjet garment printer for medium to high volume shops; decorators can create individual shirts or mass production runs without having to create film positives and stretching screens or use chemicals to reclaim these screens. The GT-782's ink retrieval system can significantly reduce ink waste during maintenance. The printer has four industrial-grade print-heads and features new 500 cc ink cartridges which offer approximately 20% lower running costs versus Brother's current 250cc ink cartridges, and more than 200% production yield out of one full set of new cartridges.

The GT-782 has independently-controlled dual platens and dual print-head modules so two garments can be printed almost simultaneously and independently. New designs can be downloaded simultaneously while the other print job is still progressing, and the new design will start printing immediately before the other job is completed. The machine prints approximately 60 prints/hour for light garments and for dark garments about 50 prints/hour using the one-pass white mode and 30 prints/hour using the two-pass mode. It has a print area of 16 x 18 inches, with optional platens available including youth (10 x 12 inches) and baby (7 x 8 inches). The GT-782 does not require any special software programs or RIP to run it. ■

Management buy-out rescues SPS

German screen printing machinery supplier SPS® Rehmus has been rescued from insolvency by a management buy-out. The new company, now called SPS® TechnoScreen GmbH, will continue with all former business activities including the service, supply of spare parts and manufacturing of the current range of SPS STOP cylinder presses, dryers and stackers. Managing director Kirsten Brast states that the take-over will not cause any interruption for the existing SPS customer base or for the supply of new printing machinery.

The reorganised company will be based at the SPS offices in Wuppertal (Germany); the current assembly site in Seevetal near Hamburg will be closed with the production of all print line components being transferred to central Europe. The contact details for SPS® TechnoScreen remain the same, with the addition of a new email address: sales@sps-technoscreen.com ■

Website relaunch complete

Roland has relaunched its website complete with a new look, new topics and new features. The website is divided into seven sections: Company, Products, Applications, Service, News & Events, Find a Dealer and Contact. The website is at www.rolanddg.be and www.rolanddg.de ■

New line of digital overlaminates

Avery Dennison Graphics & Reflective Products Division has released two new digital overlaminate lines. The DOL 1360 Gloss, DOL 1370 Luster and DOL 1380 Matte overlaminates product line provides good protection against mechanical damage and UV light exposure; they are suitable for a wide variety of applications including vehicle and fleet wraps and indoor and outdoor architectural signage, and the Luster and Matte products are for applications such as indoor wall murals where glare can be an issue.

DOL 1300 overlaminates can be coupled with Avery Graphics MPI Cast films to give guaranteed performance over complex curves, rivets and corrugations with the company's Integrated Components System (ICS) Performance Guarantee – a written assurance that the products will perform exactly how they should for the life of the graphic. The DOL 1300 overlaminate product line provides excellent adhesion to UV-curable ink jet prints and does not 'silver'. They are also resistant to abrasion, scratching and UV light, limiting damage from exposure for up to four years. ■

New software saves lab time

New software, it is claimed, can help develop more environmentally-friendly products and assess chemicals for REACH. The software toolkit is based on Hansen Solubility Parameters (HSP) – three numbers that can capture how a chemical behaves in relation to others. The Hansen Solubility Parameter in Practice (HSPiP) package includes an e-book giving access to practical examples showing the technique in practice, plus a large dataset ready for use.

"Unlocking the full power of HSP will enable scientists to create products that are more environmentally-friendly, for example, by developing better bioplastics and more efficient control of nano particles dispersion," explained Prof Steven Abbott, one of the researchers on the project. "In addition it is now possible to calculate an easy REACH 'read-across' system to assess the health and environmental impact of a large range of chemicals." ■

New generation of screen printers unveiled

Kammann's K 15-CNC is a family of newly-designed rotary indexing screen printers with up to eight printing heads and a speed up to 5400 cycles/hour; it can be used for the decoration of cylindrical, conical, oval or flat plastic and glass bottles, cups, jars, cartridges and plastic tubes etc. Variable article and screen movements are controlled by servomotors and a CNC-axis. Data input of object-related parameters via the touchscreen allows the automatic adjustment of screen stroke, article rotation and squeegee movement.

Constant movements such as machine indexing, object input and exit and the opening and closing strokes are electronically controlled and adjustable. Once fixed in its tool the object travels through all the printing stations, enabling decoration with multi-colour patterns in excellent colour-to-colour registration without the need for a register mark. Modern camera inspection for print quality control is standard. ■

The printing station

RFID development nears end

An RFID tag

Screen printing frame producer Hurtz is part of a group of manufacturers who are in the final stages of a project to develop RFID (radio frequented identification) technology for printers. With RFID technology a small tag with a unique identification number attached to the transponder is glued into a screen printing frame so the frame is identifiable and can be traced at any time. The screen printer can also deposit technical data about the frame – such as the kind of mesh, its tension, angle, degree number or tension time – in the RFID tag for electronic reading. With RFID technology the coating machine can get the information from the data in the tag about how the frame should be coated, and the washing machine knows how the frame should be washed.

Hurtz decided to use passive RFID tags as they are smaller and cheaper than the alternatives and are safe (with active tags with batteries there is a danger of explosion if they come into contact with chemical materials). The development and fixing of the tags is finished whilst the system software and its interfaces with different machines are being programmed; the complete solution is expected to be ready in the near future. ■

Ultra fine emulsion for printed electronics

MacDermid Autotype, a European manufacturer of specialised hard coated films and chemicals, has launched Autotype Plus Gold, a photo-stencil emulsion specifically designed for high tolerance electronics screen printing. The new ultra fine emulsion is ideal for photovoltaics, LCD displays, medical bio-sensors and other demanding printed electronics applications.

Autotype Plus Gold is primarily designed for use on steel meshes, where the distinctive red colour reduces edge effects (reflection nodes) to give good print quality. The emulsion is highly resistant to the abrasive inks used for solar cell manufacture to give long print life without track growth during the run. It also offers ultra fine filtration, minimal shrink back, optimised print definition / resolution and good resistance to breakdown.

Autotype Plus Gold is designed for PV and other printed electronics applications

Technigraf's new table-top dryers are being launched in November

Table-top dryers arriving soon

The Aktiprint T and Aktiprint T/e table-top dryers are being launched by Technigraf in November. The dryers feature a specially designed computer programme to optimise reflector efficiency with integrated UV lamps, achieving energy savings of over 20% without changing the UV radiation quality. With the use of iron- and gallium-doped UV lamps, energy savings of up to 30% and higher production speeds can be achieved. A UV lamp service life can be extended by around 30-50% with a sophisticated device cooling system, and premature failures due to overheating have been eradicated. ■

In-line laser die cutting

Spartanics has introduced its Finecut Laser Die Cutting Station, an in-line laser die cutter that automates cutting sequences for optimum web speeds, has a built-in job run estimation tool, cuts and stitches images to create parts in unlimited part lengths, reloads jobs in seconds, and offers cutting at up to 100 metres/minute web speed with a single laser source. The station can be built into print lines of all types and / or positioned at any point in an assembly chassis. It is available for new lines or as retrofits into older production lines, and can be configured with laser powers ranging from 100-1000 watts. Material cutting areas range from 200 x 200 mm to 600 x 600 mm depending on the application. Laser spot size can range from 210 to 280 microns. X, Y and Theta cut-to-print registration can be achieved with a wide range of substrates and components including plastics, metals, adhesives used in label applications, paper, textiles, abrasives, flexible solar materials, RFID tags, membrane switches and other flexible circuitry. ■

Greyscale printer family launched

The Delta 105 series features four printers for commercial and security printing

Atlantic Zeiser has launched the Delta 105, a series of powerful printer modules for commercial and security printing and the labelling and packaging industries. The range is available in water-based and UV models using Atlantic Zeiser inks with remote-controlled active ink supply. All models feature a print width of 105 mm (4.13 inches) and 5-level greyscale. Pneumatic print head positioning places print heads in either print or park / clean positions. The Delta 105 water-based models can print on absorbent open substrates for commercial and security printing applications. The UV ink models are designed for printing on more difficult substrates such as the lacquered, laminated and glossy materials that are often used in the packaging, food manufacturing and consumer goods markets. ■

KIWO announces reorganisation

Kissel + Wolf (KIWO) is to merge its two previous regional sales areas to create a new division, with two corresponding new appointments at senior management level. Tammo Hess, who was previously in charge of export sales of screen printing chemicals, has also assumed sales responsibility for Germany, the Netherlands, Austria and Switzerland. Rudi Roeller becomes New Business Development & Marketing Director of the newly-created New Business Development division, which will seek new applications for KIWO core competencies in screen printing as well as outside the company's key market. Rudi will continue to be responsible for marketing and also for all KIWO digital CtS activities.The reorganisation is in response to changes in the screen printing field and the global economic crisis, with a view to meeting future challenges with flexible action and a positive outlook. ■

Tammo Hess and Rudi Roeller

Release of three new printing products

Roland has launched three new products for the specialist printing industry. The VersaUV LEC-330 is a UV ink-curable 30-inch wide inkjet printer / cutter which prints CMYK+White+Gloss for customised graphics for high-end package prototypes, control panels and small lot labels and decals. The LEC-330 includes a high quality artistic print mode (1440 x 1440 dpi) for sharp, detailed graphics and text, additional print heads and production level print speeds. Users can also choose from three ink combinations: CMYK+White+Gloss, CMYK+White+White and CMYK+Gloss+Gloss.

The VersaCAMM SP-300i combines high quality printing and precision cutting for the production of signs, decals, labels, posters textile transfers etc. Roland VersaWorks 3.2 RIP software for professional prints is included in the package. Roland's new FPG2 aqueous ink can be used in combination with the VersaArt RS printers and VersaCAMM VPi printer / cutters. It is available in four colours (CMYK) and can print on a wide variety of media. FPG2 water-based inks are also an environmentally-friendly solution for indoor applications. ■

Co-operation leads to new screen print company

Fotec, a Swiss manufacturer of stencil material, and Remco-Chemie Rentzsch, a German manufacturer of screen printing chemicals, have agreed to co-operate closely in all departments, including R&D, purchasing, manufacturing, technical assistance, marketing and sales. Both companies will remain financially independent but will benefit from their joint international presence. Technological developments for the screen printing industry will be the remit of the newly-founded SPT Sales + Marketing company, which will be managed by Ralf Roschlau who will leave German printing ink manufacturer Marabu to take up the post. ■

Worldwide distribution for aluminium decoration

WP Digital and Heinrich Mantel have signed an agreement to form a worldwide network to distribute, support and develop a qualitative industrial printing platform for digital printing onto both flat and curved anodised aluminium. Based on a 4-colour digital inkjet system and providing environmentally-friendly decoration, the prints have passed tests for outdoor weather resistance, scratch and solvent resistance and long-lasting UV resistance. The companies state that the digital solution delivers speed, quality and scalability for durable prints which meet a high standard of aesthetic and functional requirements. ■

New look for screen print adhesives

Sprayway's product line of Fast Tack aerosol adhesives is now available with an updated look. The adhesives are VOC compliant and can be used during the screen printing process. Fast Tack 382 Mist Adhesive is ideal for T-shirts and similar materials, 383 Web Type Adhesive is for use on heavier fabrics such as fleece and sweatshirts and 384 is a high quality industrial grade spray adhesive with excellent heat resistance, specially formulated for flash-cure applications. ■

Fast Tack aerosol adhesives have a new design

Global success for environmentally-friendly printer

HP has announced that over 150 of its Designjet L65500 printers have been installed in Europe, the Middle East and Africa since its launch last May. The printer uses HP Latex Inks which do not produce ozone emissions during printing and contain no hazardous air pollutants. The Designjet L65500 was specifically designed with the environment in mind, so a range of recyclable substrates is also available. The L65500 can print on both water and solvent-based media at high speeds so it is suitable for both indoor and outdoor applications and is a good alternative to solvent inks. ■

Sandcarving systems for screen printers

Ikonics Corporation has developed imaging technologies for over 50 years, introducing products and process solutions for a diverse array of imaging markets and quickly adapting its fundamental, commercial and technological competencies to the needs of image-consumers everywhere. Ikonics Imaging is introducing a new opportunity for screen printers with the manufacture and supply of photo resist films and sandcarving systems. The company invites screen printers to learn how decorative sandcarving can differentiate a business through creating high margin products to quickly provide a return on investment. ■

Metallic silver ink launched

Roland has launched a metallic silver ink which, when used with CMYK inks, allows the creation of a range of special colours including gold and various metallic colours. The Eco-Sol Max ES3-MT silver ink is for stickers, signs, window decoration, labels, packaging prototypes etc.; it will first be used with Roland's XC-540 printer / cutter. ■

Italian order for flatbed printer

The Inca Onset S20 prints single and double-sided onto a variety of media sizes

Gescom recently became the first Italian print service provider to place an order for Fujifilm Sericol's Inca Onset S20, a UV curing inkjet flatbed printer which prints edge to edge onto substrates of 3.14 x 1.6 m and up to 50 mm thick, at speeds of up to 250 m^2/hr. Its vacuum table with accurate pin positioning allows users to print single and double-sided onto a variety of media sizes. The 6-colour Onset S20, combined with Sericol's Uvijet Ultratone inks, allows printers to widen the printable gamut of colours to 85% of the Pantone colour spectrum. It also features a gloss level control to produce finishes for a range of products such as display POS, exhibition graphics, backlit / front-lit displays and outdoor signage printing. ■

New CEO for the Polytype Group

The Polytype Group has announced a change in management, with Peter Ruth becoming the new Group CEO of the Polytype Holding Corporation and member of the management group of Wifag Polytype Holding, its parent company. For the last two years Peter has been acting as director of Polytype; he succeeds Battista Corti, who has been elected as chairman of Polytype Holding, replacing Ulrich Zimmerli. The Polytype Group has approximately 650 employees worldwide and manufactures printing machines for plastic tubes and cups, and complete lines for metal cans and tubes for the cosmetic, food and pharmaceutical industries. It is also active in the production and sale of large-scale installations for the coating / lamination of foils for the food and pharmaceutical packaging industries, as well as technical films for solar and textile applications. ■

Thieme announces new Italian representative

Thieme, a leading manufacturer of printing machines, has appointed Marabu Italia as its new marketing representative for Italy. Thieme considers itself fortunate to have acquired the services of Marabu, which is already an established leader in the printing systems market. Marabu, headquartered in Tamm (Germany), is a leading ink manufacturer for screen, pad and digital printing. ■

The Stylus Pro GS6000

New printer aims at wall coverings

Epson has launched the Stylus Pro GS6000 which it is initially aiming at the signage market, specifically targeting high end indoor signage, art production and interior decoration. One new application is digitally printed wallpaper; custom-printed digital wall covering is a growing market, especially in professional environments such as offices, hotels and airports, and the DIY market is expected to follow this trend with personal pictures being printed to cover an entire wall or room.

Epson joined forces with wallpaper manufacturer Erfurt to develop a digital wallpaper with Com2-C, a digital printing solution provider, and Neschen, a digital print reseller. The result is a fully embossed wallpaper with all the features of traditional wallpaper – it can be pasted and it can 'breathe' in order to allow moisture evaporation – but any design can be printed onto it using high quality tiled image panels (via a RIP developed by Colorgate) to make an individually-designed wall. The GS6000 has eight colour Ultrachrome inks and prints at a resolution of up to 1440 dpi. It uses environmentally-friendly inks which require no special ventilation, and variable size dot technology gives extremely high image quality. ■

REDUCING COST WITH LONGER PRINT RUNS

John Gaudiuso explains how the choice of mesh in screen printing applications could lead to cost savings

SCREEN PRINTED ELECTRONICS GET INCREASINGLY SMALLER so finer features are required. Cost also becomes important as screens are being used up more due to dimensional issues occurring faster. This is seen more with meshes made from stainless steel because of its deformation properties over print runs.

There are different ways to combat screen dimensional stability and longevity problems whilst also being able to print fine lines. One method is to use a trampoline screen to help improve the longevity of stainless steel mesh. Stainless steel mesh is rigid and has difficulty returning to its original form. Using a trampoline screen allows the outer mesh (a more elastic mesh-like polyester) to expand more than the inner, more rigid mesh. The outer mesh is more elastic and will return to form more than the more rigid inner mesh, which in turn allows longer print runs. Although this option is a good option, it is still a more time-consuming method to manufacture a trampoline screen with stainless steel mesh than it is to stretch a single mesh onto a frame.

The second option is to use a synthetic mesh such as V-Screen, which has advantages over many other meshes. The mesh is woven with a large open area and a fine thread comprising Vecry fibre; this has a structure made up of a liquid crystal-based polymer core called Vectran, with a sheath of a flexible polymer called Pen. Some important features of V-Screen are its high tensile strength (stronger than stainless steel), almost no plastic deformation during printing, outstanding abrasion resistance, fine line printing and translucent fibres. All these features allow for longer print runs with better edge definitions.

STRENGTH AND PROPERTIES

V-Screen's high tensile strength allows for a stronger mesh with larger open areas, giving it the ability to stretch to higher tensions which helps in reducing the snap-off distance of the screen, which in turn helps with the longevity of the screen. This feature also helps keep dimensions over long print runs because the mesh doesn't have to deflect as much to transfer the paste.

V-Screen has almost no plastic deformation during printing, primarily due to its physical properties. Vecry is a synthetic material that has memory, much like a memory foam mattress, while natural materials such as stainless steel do not. After the forces of a squeegee are repeatedly applied to any screen, the screen will begin to distort. However because of V-Screen's memory, the distortion is minimal. Because of having a higher tensile strength, it is possible to achieve higher screen tension where less snap-off distance is required for printing. Consequently less squeegee force has to be applied to V-Screen when printing compared to screens made with other mesh materials, thus further improving dimensional stability over long print runs.

V-Screen can hold its tensions over these long print runs which allows for virtually no tension loss. Once tension on the screen changes, pattern dimensions begin to change. Holding a tight tolerance is easier to achieve while printing more parts using the V-Screen. Figure 1 shows the dimensional stability of a V-Screen's dimensional accuracy over 5000 prints.

ABRASION RESISTANCE

V-Screen has outstanding abrasion resistance, which is important for the durability of a screen. Abrasion resistance is also important so that the paste being used does not get contaminated with particles from the mesh. If particles from the mesh, especially stainless steel mesh, get into the paste it is possible to see anomalies in the finished part with variances in desired results, so the yield will decrease.

This is seen in stainless steel meshes because of the squeegee giving a rubbing motion across the stainless steel; the repeated friction causes the metal to abrade off the wire thread. Figure 2 shows a thread from a stainless steel mesh that has been abraded on the squeegee side and not on the substrate after printing 5000 times. The picture on the left is an abraded wire thread on the squeegee side and the picture on the right is on the substrate side. The printing conditions for this were a stainless steel mesh with 250 threads and a 30 micron wire diameter (ST250-30), silver paste, urethane flat squeegee and 5000 prints.

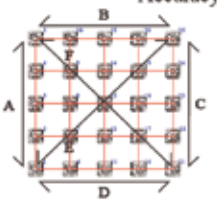
With the larger open areas and fine threads of V-Screen, it is possible to print smaller features such as 50 micron line widths. The smallest feature achieved to date with V-Screen is 30 microns in a laboratory setting using an organic paste. Having larger open areas and fine threads also makes it possible to achieve a better surface roughness value (RZ), which is important for gasketing the screen to the substrate. When a good gasket is formed, less bleeding occurs and straighter printed lines can be achieved.

EMULSION AND ADHESION

To achieve finer print features and good line resolution, the emulsion used is important. Although any emulsion works well with the V-Screen, one emulsion was made specifically to be used with it. The V-1 emulsion is a soft emulsion that has great line resolution for fine features. As it is a soft emulsion it has the ability to form over substrates that have varying surface roughness, causing a better gasket which leads to lower bleeding issues.

Translucent fibres allow for better emulsion adhesion. In some other meshes, such as stainless steel, the emulsion does not

Accuracy of entire lengths



	Targeted (mm)	5000th print (mm)	difference (μm)
A	100.00	99.995	-5
B	100.00	99.996	-4
C	100.00	100.000	0
D	100.00	99.990	-10
E	141.42	141.417	-3
F	141.42	141.412	-8

Figure 1

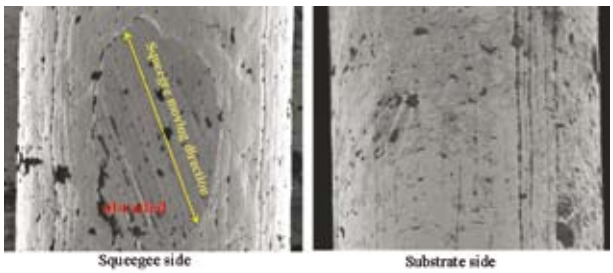


Figure 2

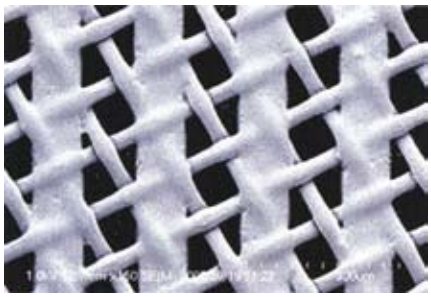


Figure 3a

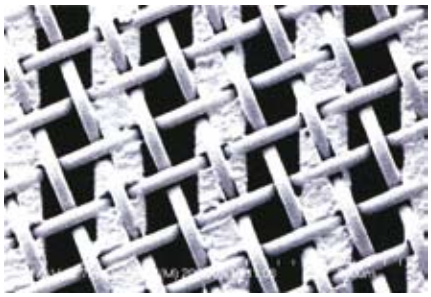


Figure 3b

encapsulate the thread; the V-Screen allows for light transmission through the threads and encapsulates the emulsion around the thread, including on the squeegee side. By encapsulating the thread in the emulsion, the emulsion has a larger area to hold on to during printing, which also helps with longer print runs because the emulsion won't wear away as quickly. This also helps with creating better edge definitions during printing.

Figure 3 shows a picture of V-Screen on the squeegee side and stainless steel on the squeegee side. On the V-Screen, the emulsion is hardened on the entire surface. The stainless steel screen is not fully hardened on the squeegee side. Figure 3a shows emulsion encapsulated around the synthetic thread of V-Screen whereas Figure 3b shows stainless steel not exposing the emulsion on the squeegee side.

By using the V-Screen it is possible to lower production costs due to the longevity of the screen, whilst its structures give it the ability to print fine lines. V-Screen has a high tensile strength, almost no plastic deformation, outstanding abrasion resistance, fine line printing and translucent fibres, all helping to give it a longer life. V-Screen is not going to cure the need to print finer lines than 30 microns, so a trampoline will be a good second option. ■

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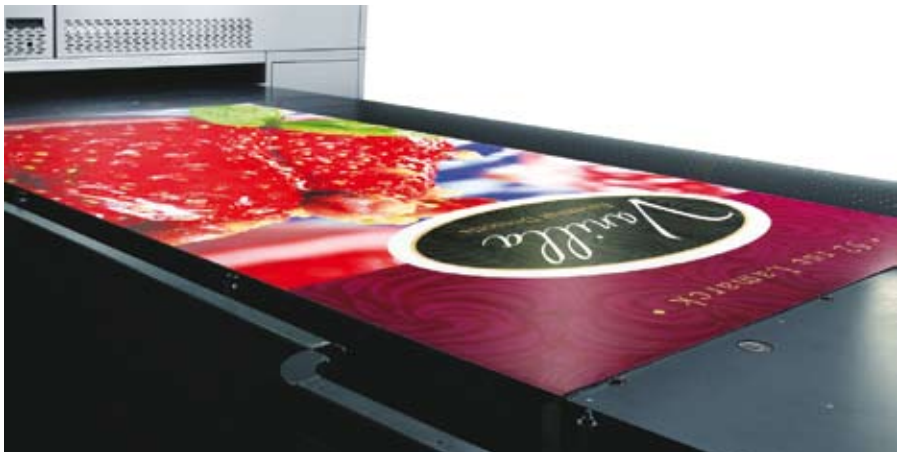


The FB7500 is HP's newest wide format printer

THE DIGITAL REVOLUTION IS HERE

Udi Nachmany outlines the reasons behind the move from analogue to digital printing in the wide format market

THE DIGITAL REVOLUTION IN WIDE format printing is well under way with printers available for virtually every application and environment. The introduction of wide format digital printers has stimulated a major migration of jobs from analogue to digital production, as well as growth in the wide format sector. Reduced end-to-end production times have spawned new short-run applications, shorter lifetimes for sign and display products and faster times to market.

Screen printers have adopted a digital capability and new companies have been established that offer only digital wide format printing, while commercial printers have added wide format capabilities to capture new business from existing customers. These shifts in the market will come to be seen as revolutionary. Wide format digital printing is altering the look of our streets and urban environments. Changes will further accelerate as the digital revolution continues. The term 'revolution' perfectly describes the state of the wide format sector today, which retains its momentum even in the current sluggish market, with growth predicted around the world:1-3 per cent in North America and western Europe and 7-10 per cent in emerging markets and other regions(1).

With a worldwide market value of €58 billion (with €28 billion(2) in Europe), the wide format sector is a dynamic market. Currently more than 25 per cent of print production is carried out on digital printers(3). While analogue technology has specific application fields, there are a number of reasons why traditional sign and display printers should seize the opportunity and convert to digital production.

BALANCING TRADITION AND OPPORTUNITY

While tradition and established printing processes made sign and display printers successful, it is, however, clear to most of them that digital can no longer be ignored. The challenge for most sign and display printers is to adopt and manage a portfolio of different technologies at the right time to keep their clients satisfied and remain competitive.

Digital is not new in wide format printing and is already well established for specific applications and ranges of run lengths. Now digital is opening new doors, with cost-savings and productivity gains from previously analogue jobs and new applications that can only be printed with digital technology, such as billboard versioning and localised point of purchase / point of sale (POP/POS) displays. The variety of digital solutions available now will soon fill almost every application.

For screen printers considering a move from analogue to digital production, market trends positively support the decision. Run lengths continue to decline (both as a result of marketing trends and economic pressures), just-in-time fulfilment, increased demand for versioning and shorter turnaround times lead the list of trends observed by screen and display print service providers (PSPs)(4). While all of these may be delivered conventionally by screen technology, they cannot be delivered profitably.

MAKING A CHOICE

Given the reality of the market trends, downward pressure on prices and a continuing requirement for quality, analogue printers should ask what type of digital solution best suits their customers' requirements. This is an important question because once made, the choice will govern the jobs a PSP can undertake. Like cars that use either petrol or diesel, wide format printers run on their specific ink types (solvent, water-based, UV-curable or latex) which are not interchangeable. This makes the choice of system critically important.

While there are a lot of variations, the basic decision comes down to three major factors:

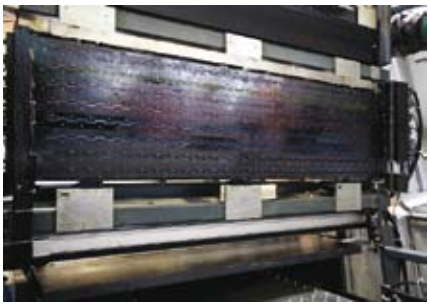
- What PSPs are used to
- What applications PSPs think they can sell
- What is perceived as a special new market opportunity.

For example, a screen printer who is familiar with solvent-based inks may feel that adding a wide format digital printer that uses solvent ink is the best move: he knows the way the ink works and the applications it can be used for, and has customers who are already familiar with the results. Similarly a printer may have insight into his customers' requirements and will choose a printer that broadens his offering, or he may see a whole new market opening up that will attract new customers.

PRINTER PORTFOLIO

HP printers offer a range of inks, speeds and application possibilities that meet today's customer requirements. Designed for 24/7 operation, each printer offers a specific technological advantage for sign and display PSPs.

The HP Scitex FB7500 printer is HP's newest wide format machine. Developed in conjunction with screen printers it was designed for fast-paced, industrial printing environments and is a versatile UV flatbed printer designed for high-quality POP/POS applications, exhibition graphics, signage, backlit displays and posters. With maximum speeds of up to 500 m^2/hr it incorporates HP Scitex X2 print heads which are designed for high use, low maintenance and user replacement.



The X2 print heads on the FB7500 are designed for high use, low maintenance and user replacement

The TJ8550 printer is designed for high volume outdoor applications

The TJ8350 and TJ8550 printers are designed for high quality, high speed production of wide format graphics for high volume outdoor applications such as billboards, bus shelters and indoor POP displays. These printers can print sharp text down to 8-points for close viewing with resolutions up to 600 dpi. They have three print speeds (Billboard mode, POP mode and High Quality mode) and production speeds range from 100 m^2/hr to 480 m^2/hr. The TJ8350 printer uses HP Scitex TJ110 Specialty Solvent Ink, an alternative to traditional solvent inks that produces no HAPs(5), enabling PSPs to provide a safer working environment. The TJ8550 offers the same functionality but uses UV-curable ink.

The FB6700 printer is optimised for POP/POS applications, displays, samples, short and trial runs and other applications. This fully automatic printer uses odourless, non-hazardous water-based inks which are ideal for in-store use and can be used in proximity to foods in packaging and POP/POS applications; they can print on a wide range of rigid substrates including corrugated, polypropylene, polycarbonate, foamboard and PVC. The printer uses standard artwork formats and can print at speeds of up to 29 160 x 320 cm sheets/hr, equivalent to 150 m^2/hr. The FB6700 can form the core of a POS/POP display business or can be used to extend the activities of trade shops, corrugated printers and screen printers.

KEY DIGITAL BENEFITS

There are myriad benefits to digital wide format printing, including factors that add value, increase production speed and improve profitability. Among them are cost-effective short runs, easy last-minute changes to digital artwork files, the ability to produce short runs of versioned products, often tailored to specific locations, faster end-to-end production speeds, less expensive trials, prototypes and short run reprints, and a complementary technology to screen printing that gives sign and display printers the opportunity to offer new profitable products to the market. As PSPs print only what is needed with digital technology there is less waste, less spent on storage and reduced waste disposal costs.

The move from analogue to digital is more than a shift in technology, it is a change in the fundamental way that wide format print suppliers and their customers think about how to serve their market. Imaginative thinking in conjunction with digital solutions means that sign and display print service providers can say yes to requests never possible to fulfil until now. ■

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(1) The Wide Survey, FESPA / InfoTrends, 2009: growth in the US and western Europe is predicted at 1-3 percent while in emerging markets, Asia-Pacific, Latin America, Eastern Europe and the Middle East, growth is predicted at 7-10 percent.
(2) The Wide Survey, FESPA / InfoTrends, 2009.
(3) HP internal source.
(4) The Wide Survey, FESPA / InfoTrends, 2009.
(5) Based on third-party testing conducted in August 2008 that found no detectable Hazardous Air Pollutants (HAPs) per US Environmental Protection Agency Method 311. HAPs are air pollutants which are not covered by ambient air quality standards but which, as defined in the USA's Clean Air Act, may present a threat of adverse human health effects or adverse environmental effects. Such pollutants include asbestos, beryllium, mercury, benzene, coke oven emissions, radionuclides and vinyl chloride.

PROGRESSIVE BUILD TO GREY

Tim Quinn outlines the G7 method for calibrating and printing to Neutral Print Density in all printing processes

THE G7 METHOD FOR CALIBRATING AND printing to Neutral Print Density (NPD) is becoming more popular in all printing processes. As a means of control in 4-colour process printing, NPD provides a shared appearance in the same image printed across multiple platforms, and the ability to achieve and maintain colour within a production run, as well as from run to run, in the screen, digital, offset and flexo printing industries.

With properly controlled NPD an image can be reproduced by any print method desired, which is critical for screen printing to maintain its viability as a process. Moving towards this method of control requires recalibration of each screen press, which takes some time with multi-colour presses. Those with single colour presses, however, are at an additional disadvantage because press adjustments made during printing / calibrating cannot be assessed until the last colour is printed.

This article describes a process that develops grey balance for one-colour presses from linear plates. It involves deriving NPD curves and maintaining grey balance in production by predictably building up to grey as the print order proceeds.

STEPS TO NPD

To achieve NPD it is necessary to initially print linear films with press parameters set up to be as wide as possible. Printing is completed with press parameters adjusted to finely dial in the grey balance. If the NPD values cannot be achieved linearly, the films are curved appropriately and reprinted to gain proper NPD values. Once these process adjustments and film curves are set, results show colour is achieved in less time and maintained more consistently throughout the print run.

A key element of this process is to aim for grey balance from linear plates on the first run. This is a new concept and is often possible. Aiming for NPD on the initial linear run achieves at least four key benefits:

- Press operators learn to use grey balance as a function of press control
- The full impact of tonal change, by making on-press adjustments, is easily seen and understood
- Aiming for NPD brings consistency to the workflow; it is factored into the neutral print density curve (NPDC)
- The resultant press compensation curves are coherent and synchronised; they move up or down together.

USING THE HR POINT

The G7 / NDP process calls for three grey points to monitor grey balance: 25% HC (Highlight Contrast), 50% HR (Highlight Range) and 75% SC (Shadow Contrast). The 50% HR is the best target point for the first G7 run. Figure 1 shows graphically the impact on the tonal range, expressed in percentages of change, by density or press adjustments. According to this graph, the 25% HC is not a good control point due to the low impact of change.

	C	M	Y	Spread
CMY	.60	.60	.60	.00
CY	.53	–	.43	.10
MY	–	.46	.56	.10
CM	.60	.60	–	.00

Chart 1: Two colour accumulative density readings on the HR

Although it could be suggested that the 75% SC (Shadow Contrast), shown on the right in Figure 2, should be the ultimate aim point, tests show that using the HR 50% proves to be the most stable method, resulting in synchronised NPD curves.

PRESS SETTINGS

Ideal press settings establish the widest window of press adjustments (+ and -) that can be made to dial in the NPD. For example, calibrating a press when the squeegee pressure is at a maximum only allows for a reduction in pressure; there is little or no room for positive adjustment, so start with all press settings in the mid-range of acceptable results.

The charts provide actual results of printing linear film with press adjustments set to the mid-range values of 50 pounds of pressure with a squeegee speed of 6 and squeegee angle of 1 inch / 2.5 cm. Chart 1 shows the CMY press compensation curve results required to hit G7 NPD by adjusting press settings to achieve grey balance. The CMY compensation curves are nearly identical.

Chart 2 shows the CMY press compensation curve results required to hit G7 NPD using neutral press settings. Generally separate curves have to be used for each colour, with the benefit that the press remains neutral, maintaining its full adjustment range. The black curve remains unchanged in both examples because black is a non-chromatic colour, independent of grey.

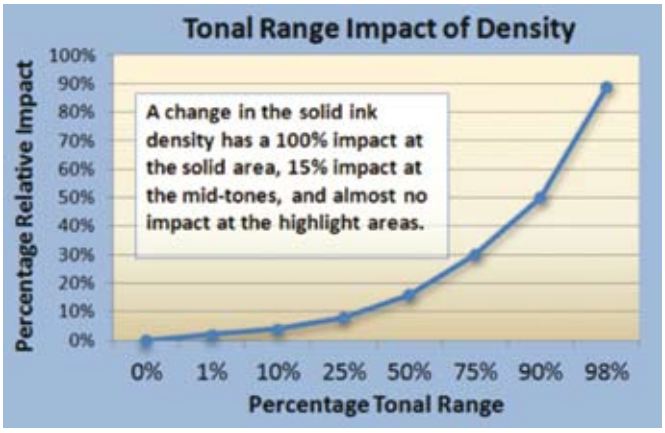

Figure 1

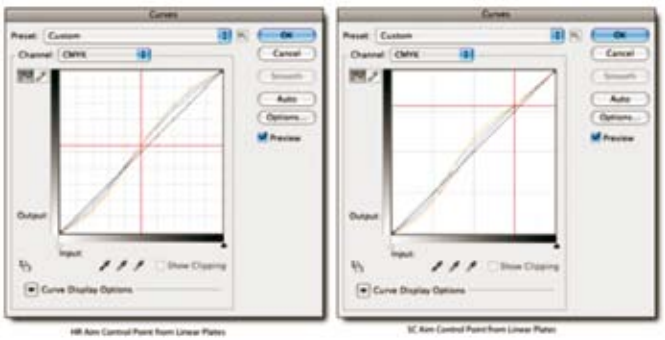

Figure 2

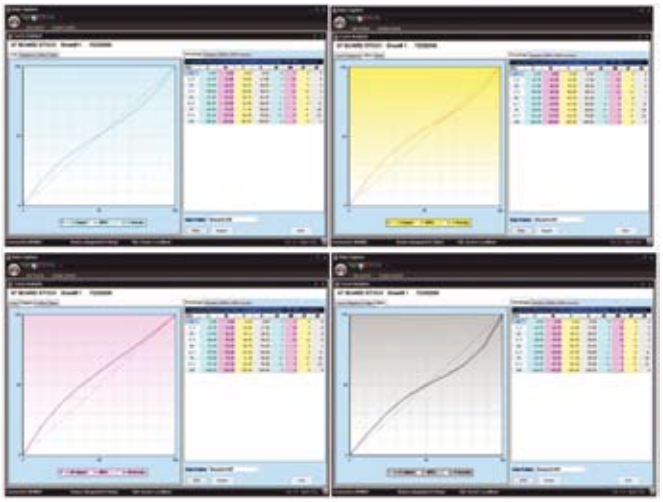

Figure 3

The press settings were then adjusted, per colour, to dial in the NPD:

C	40 lb pressure	8.5 speed	squeegee 1 inch / 2.5 cm
M	60 lb pressure	4.0 speed	squeegee 7/8 inches / 2.2 cm
Y	60 lb pressure	5.5 speed	squeegee 1 inch / 2.5 cm
K	50 lb pressure	10 speed	squeegee 7/8 inches / 2.2 cm

Chart 2

CMY data shows neutral results in the following curves. Notice that the CMY curves from Figures 3 and 4 are all noticeably different from each other, with the magenta and yellow showing the widest variance. The correction curves in Figure 4 exhibit consistency and smoothness while minimising unwanted compression to any image's dynamic range. The CMY correction curves are also all noticeably similar. The established press settings and curves provide a wide range of adjustability and consistency.

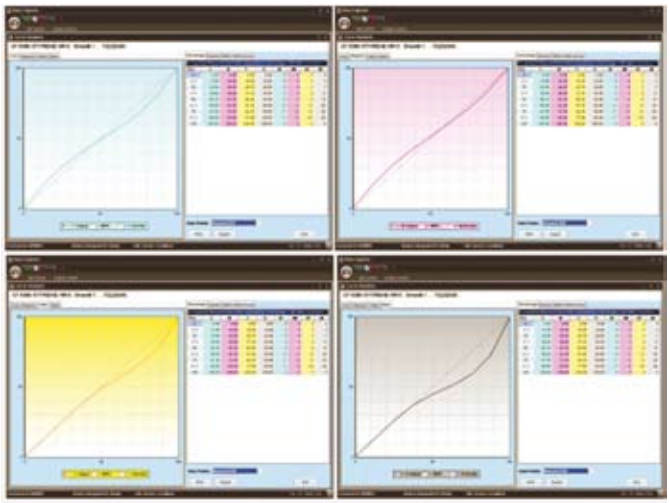

Figure 4

PRINT ORDER

A Design of Experiment (DOE) process was used to test and verify the optimum single colour print order and 'build to grey' weight values for the second colour down. When printing one colour at a time to NPD, the first and second colours down are the only variables that separate single colour printing from inline printing. For example, assuming the press is calibrated and the print order is C-M-Y-K, the third colour down gives a full grey scale for accumulative density readings and the fourth colour is independent of CMY.

Testing has proven that any print order can be used, but cyan is the easiest to implement. This is for two reasons: firstly the HR aim

Figure 5

point is a build of 50% C and 40% YM. Cyan is the only colour that matches, in the grey ramp, the same values as the single colour bar, whereas M and Y ramp to a ratio of cyan, so it makes sense to have a control point aim that remains on the colour bar after the 'build to grey'. Secondly 50% cyan and 40% magenta are the only two colours that, when combined, equal the same accumulative density.

Using a control test, prints were measured from a compliant G7 digital proofer where the HR was calibrated to read C:60, Y:60, M:60. The test (see Figure 5) was designed to simulate all possible two-colour combinations: CY, MY, CM and their reciprocals. The results show the best print order to be CMY then K. The build to grey has no differential between C and M. Chart 1 shows that the other two options, MY and CY, are more difficult to print because of density differential.

CMY to grey, on a single colour press, is easy. After the test file is prepared, using the G7 layout modified to fit the press and imaged linear films / plates / screens, do the following:

- Print the cyan screen; on press after printing good clean dots, balanced all around the sheet with the press settings at neutral, read 50% cyan patch using a densitometer in density all mode.
- Print the magenta screen; switch to reading the G7 HR 50% grey patch, which is a build of 50% cyan and 40% magenta. Adjust press settings until the HR grey patch has equal cyan and magenta density readings – disregard yellow and black for now.
- Print the yellow screen; read the same G7 HR 50% grey patch. Adjust press settings until the HR grey patch has equal cyan, magenta and yellow density readings. With no compensation curve, the gain will be low but balanced and grey. As the black is independent of the grey, it can be printed using good clean dots and kept equal or close to where the cyan 50% patch started.

CONCLUSION

At this point the press is printing neutral and grey, which is the base line for all good printing. Previously this had been very difficult to produce, especially on single colour presses; a typical screen press would also have needed compensation for the highlights, mid-tones and shadows. The compensation curves can be built manually using a graph paper method or using software such as IDEALink Curve Software from IDEAlliance or Data Capture System (DCS) from Nazdar Consulting Services. After applying the necessary compensation curves, use the same 'build to grey' technique as previously described from the linear run. Many printers using this technique report significant time savings on press setup, approval and G7 proof matching. ■

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PRESS MAKE-READY TECHNIQUES

In the concluding part of his article, Mike Young examines masking out, vacuum dynamics and power when preparing the print table for superior print quality

IN THE FIRST PART OF THIS article (see issue 3 2009) I discussed four of the six vital factors necessary for print table make-ready that were critical for dynamic production performance. I shall continue with the final two, which are perhaps the most crucial for affecting quality of image reproduction to replicate as much detail and likeness to the original film positive. I shall also reveal what caused the problem at the commercial printer that was outlined in the first part of this article.

MASKING OUT THE VACUUM AREA

For a print job's initial success or self-destruction, masking out exposed vacuum holes in the print table is arguably one of the most important aspects of preparation during make-ready. Nevertheless, it is probably also the least considered when seeking quality results and demanding performance – the core of what this article is about. The sole purpose for suitably masking out the print table is to ensure that the screen is unaffected by the substrate or vacuum during the printing cycle.

Under ideal conditions it will permit lower off-contact (subject to screen tension) and the minimum amount of vacuum power applied – just enough to hold the substrate firmly in place so the screen can easily separate behind the squeegee without hindrance. When the state of this key make-ready requirement is not properly met, it is often the source for total disappointment when everything else appears to work well.

The objective first requires all exposed vacuum holes beyond the substrate to be masked out with a non-porous material. Although inexpensive ultra-thin newsprint-type papers have proven to be popular among commercial printers, there is a point where critical elements of print reproduction render them no longer useful. Leaving the row or two of vacuum holes unmasked around the substrate edges can also be problematic in production, depending on the degree of difficulty or detailed reproduction required as well as other factors.

Although I have a rule to never interfere with a press once it has been set up and in production unless otherwise invited to do so, on several occasions I have fixed the problem of exposed vacuum holes by blocking them off during production, only for operators to observe that print quality had suddenly improved. As a result of experiencing instant enhancements made in this manner, failure to mask out exposed vacuum holes must be one of the biggest let-downs in press make-ready for those seeking high quality print results such as 4-CP of all line counts, monotones, tone graduations and fine line work.

DYNAMICS OF TABLE VACUUM

To better understand the dynamics involved with print table vacuum when it is not suitably masked out, consider what happens in the following different but entirely normal everyday scenarios on the production floor:

(a) A substrate that is non-porous (such as polyester or self-adhesive decal), together with porous material used for masking out (such as paper or newsprint)

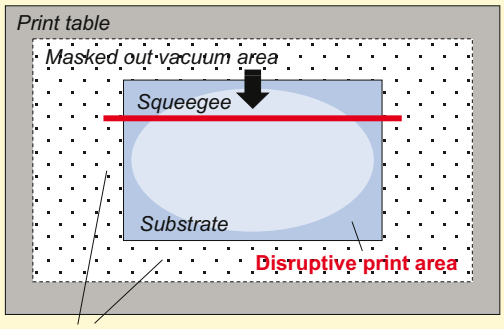
(b) A substrate that is porous in nature with non-porous masking material.

When there is nothing on the print table and it is free of masking material / tape, the vacuum pump pulls all of its air from all the vacuum holes collectively across the entire vacuum area. Assume for production scenario (a) above that a medium size sheet is to be printed and positioned in the middle of the print table so that vacuum holes will be exposed all around it. At this point, where does the vacuum pump try to pull its air from? It must come from the route of least resistance – the open / unmasked vacuum holes beyond that of the substrate. While the concept is generally understood and accepted as being normal, something else happens that can be detrimental for quality make-ready: incoming air entering each exposed vacuum hole will increase quite considerably in velocity as there are fewer holes effectively trying to draw in a large amount of air.

To complete print table make-ready, porous-type material is used to mask out the exposed vacuum area around the substrate. The vacuum pump has no choice but to continue to bring most of its air from the same area that is now masked out as it is still the route of least resistance. Another way of expressing this condition is to suggest the exposed vacuum area outside the substrate now has a much stronger powerful vacuum 'hold-down' force than it would have done without the substrate.

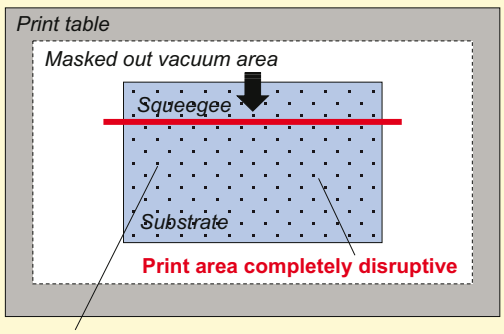
Fig. 2 **MASKING OUT THE PRINT TABLE**

a) Printing with a non-porous substrate using porous paper-based material for masking



Vacuum pulling the screen down outside the image area will prevent it from separating cleanly behind the squeegee during the print stroke

b) Printing with a porous substrate using non-porous paper-based material for masking



Conversely, vacuum keeps the screen in contact longer than desirable whilst ink is sucked out of the screen

Figure 2

The dynamics of table vacuum has changed radically and not in favour of the operators' make-ready endeavours. Consequently the screen outside of the image area will be sucked down or physically held down beyond its natural ability to cleanly separate behind the squeegee during the print stroke (see Figure 2a). This will have a direct negative impact on print quality, particularly towards the outer areas of the image, resulting in uncontrollable gain and smearing amongst other faults.

There is also an issue with leaving rows of vacuum holes exposed, where the vacuum pump will do its utmost to draw much of its air from since there is no restriction. Velocity in these holes has increased significantly, and powerful vacuum seeping through the masked out area does not help the situation. Exposed vacuum holes can be destructive with edge definition becoming crisper, sharper and cleaner towards the outer edges of the image once the necessary rows of vacuum holes have been properly taped off.

THE LAMINATING EFFECT

The situation is often unintentionally made worse when excessive vacuum, in addition to far too much squeegee pressure, effectively laminates the substrate to the table, particularly if thin, smooth / glossy and static-prone. This is evident with printing operations experiencing trouble separating printed substrates from the table, as such a situation generates so much static once it has been separated that it potentially causes problems for subsequent colours and other handling issues.

Additionally, operations using grippers or vacuum take-off system, especially with 4-post / reciprocating table type machines, can experience even more frustrating problems due to this self-created laminating effect. Owing to the powerful hold-down force by the vacuum system, together with excessive static that is naturally generated upon separation of the printed sheets, one or more things can occur: either the printer's integrated take-off system fails to entirely remove the sheet from the printing table, or if it does satisfactorily, the sheet will suddenly cling upwards to the underneath of the screen the moment the take-off mechanism releases it.

Once a printed sheet has been separated and removed from the print table, the additional static generated continues to travel through the printing machine's take-off mechanism. Once released, however, the link in the static chain breaks and the sheet then becomes attractive to the nearest object, which in this case is the screen. Similarly when removing printed sheets manually from a press they have a tendency to cling to the front of operators' clothes. The best way to avoid these issues, other than by improving environmental controls, is to use the lowest vacuum power possible and consider separately grounding the printing machine's chassis or print table to reduce the full negative effects of static during production.

THE SECOND SCENARIO

In the second production scenario (b) the materials are reversed: the printed substrate is porous (such as poster paper-type stock) but with a non-porous vacuum masking material (such as the low-tack adhesive-backed pre-mark material that is gaining popularity). Once the exposed vacuum holes are masked out, the vacuum pump tries to draw its air from the porous substrate because it is the route of least resistance. Velocity has also increased in each vacuum hole throughout the substrate area, as there are fewer of them; this means air is literally being sucked through the substrate before the print cycle even commences – not an ideal setup situation to experience when seeking quality print performance (see Figure 2b).

To prove this point, a simple non-intrusive demonstration can easily be made. Place a larger piece of non-porous material over the whole substrate after it has been registered on the table and is ready for printing, then try to slide the test material along by holding one

Continued over

corner (without peeling it off from the table). Vacuum seeping through the substrate will make it impossible or difficult to slide because it is being held down by powerful suction. With vacuum switched off it is easy to slide the test sheet over the substrate. Even when actual seepage may seem to be small or inconsequential, it will certainly be enough to create problems.

As air seeps through the substrate, during the print stroke the screen will want to stick to the substrate at the point of squeegee contact – thus the screen becomes sluggish in separating cleanly behind the squeegee. Due to the elastic properties of the mesh, actual droplets of ink that are transferred, creating the image, are then dragged along because the fabric stays in contact with the substrate much longer than it should, thereby destroying what would have otherwise been an acceptable print.

Although the 'dragging effect' may only be slight, it creates a smudgy print or an appearance of massive / ugly dot gain; it is like making a fingerprint: if the finger does not lift cleanly from the paper surface but is pulled slightly back instead, much of the detail will be smeared and lost. Any amount of vacuum seeping through the substrate will have a tendency to suck out more ink from the screen than what the mechanics of the screen and squeegee were designed to do by default. In this instance, only the slightest amount of vacuum is required to hold the substrate down to provide a more accurate print reproduction.

Materials or tapes used for masking out therefore have a much greater impact on how well the printed image will eventually appear during production. It is reasonably safe to assume that the cost of many wasted sheets during production, particularly with multicolour / 4-CP jobs, far exceeds the additional cost for more suitable masking materials.

VACUUM POWER

Looking at the amount of vacuum power used, the amount of suction applied to hold substrate firmly in place during the print stroke has more to do with smooth uninterrupted production than most operators realise. If the substrate is porous or semi-porous, using excessive vacuum will suck the screen down to the table throughout the image area. The end print result can be ugly and unsightly with a complete loss of deposit control, highlights and shadow tones gone astray due to massive dot gain, and other issues.

Applying too much vacuum to thin substrates, which can occur with a series of blocked holes everywhere, means the print surface could end up with marks corresponding to the holes, particularly if large in diameter. It is very easy to use too much vacuum but not possible to use not enough; too much vacuum will needlessly run the risk of generating additional static to the detriment of print quality and handling. Additional static also creates a print defect known as 'cobwebbing', where fine strings resembling cobwebs are randomly created from the edges of the printed image, similar to hair on a forearm wanting to stand on end in the immediate presence of static.

Static-prone materials, and even some non-static ones, have a tendency to cling to the underside of the screen the moment vacuum shuts off after the print stroke. Generally press operators apply more vacuum, hoping to keep the substrate from sticking to the screen – however this action may do more harm than good. As well as an uncontrollable amount of static presence in the workplace, the potential cause of printed sheets lifting with the screen is using too much vacuum to begin with!

Creating this strange paradox is better visualised when one understands that the squeegee tends to squeeze the substrate down onto the table and is then aided by an extremely powerful vacuum wanting to induce an extreme airtight bonding condition, as if it was literally laminating. When the vacuum is released, the inner forces required to separate the substrate from the table self-induces a huge amount of static well beyond that which originally existed in the material and that which was created by normal squeegee movement. Once a printed sheet separates from the table, additional static produced upon release automatically becomes attracted to the nearest large object in the area.

OVERCOMING STATIC

Static works in peculiar and illogical ways and consequently is seemingly impossible to pinpoint and control. In the scenario given above, it is possible that another problem occurs where the printing machine's take-off mechanism (either mechanical grippers or suction cup system) will not budge the printed sheet at all from the table due to the static electricity's severe powerful force. The combined effect of both excessive vacuum and too much squeegee pressure compresses the substrate down so hard that it induces the ideal conditions that static loves to thrive on.

Because so much physical force is required to separate the two, mechanical take-off systems often experience great difficulties in satisfactorily overcoming the situation. Reducing vacuum power is one simple way that often helps to decrease much of the static being generated to prevent sheets from clinging to the screen or staying put on the print table. When handling or removal becomes troublesome, consider reducing squeegee pressure too. Separately grounding the machine's chassis or print table may also prove to be another good

technique to reduce static to a more acceptable level, as it sends most of the built-up static charge out to ground rather than leaving it to dwell within the substrate itself.

While sitting on a panel during an 'ask the experts' open forum, the question was asked why equipment manufacturers did not use more powerful vacuum pumps in their machines, as the questioner thought they were too weak. One of the panellists suggested using as much vacuum as possible to get round the problem. When enquiring further about the question, I had to reassure the audience that the complete opposite was true and explain my reasoning. I said that while OEMs may need to refit their presses with powerful pumps according to the markets they serve, only the smallest amount of vacuum is required. While a thick warped stock such as a sheet of corrugated board might require the maximum vacuum to hold it flat, it was still the minimum for the relevant substrate. When the next job is set up on a press, for instance with a lighter or non-curly material, vacuum is seldom reduced during make-ready; only use enough vacuum for the job – just sufficient to hold the sheet firmly in place.

SUMMARY

I have covered four important considerations with print table preparation during making-ready which operators have directly under their control. However for the sake of superior print reproduction results, supervisors should note that allowing extra time for a more meticulous preparation, particularly when handling difficult materials or meeting more stringent printing demands, will always pay off in the long run. Printing a job without interruptions, irrespective of production speed – through better table preparation – will always provide the greatest yield, and hopefully with superior quality at no extra cost.

THE ORIGINAL PROBLEM

As for the printing company I visited to troubleshoot (see part one of this article), the problem hit me the moment I stood by the printing machine. The staff were printing half size sheets on the newly-installed large press but did not mask out the table sufficiently, using newsprint and leaving several rows of vacuum holes exposed. The vacuum was therefore sucking down the screen at the outer edges of the image. When I quickly re-masked the print table with display board (the same material they were printing with), the image became sharper and cleaner looking. The staff were now experiencing much greater detail and for the first time they could see the overhead light reflecting off the fruits they were printing for a supermarket produce display; they ran all evening without having to wash the screen and without rejects.

With the hi-tech control over halftone separations, quality pre-press for art generation, above average screen-making practices, sophisticated printing equipment and quality in-house operating procedures (SOPs), who would have thought that reproducible fine detail came down to how well the print table was prepared? This confirms that suitably masking out the table is vitally important for high quality print preproduction, and vacuum power, while a necessity, can have an adverse effect when excessively applied – as can squeegee pressure. ■

The first part of this article appeared in issue two (2009) of Specialist Printing; go to www.specialistprinting.co.uk for details of how to subscribe.

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PAD PRINTING 101: BACK TO BASICS

In the first part of his article, Sigi Knappik introduces us to pad printing and its key components

EXPERIENCED FIELD TECHNICIANS FREQUENTLY VISIT CUSTOMERS who have transfer pad printing equipment in operation. Many of the questions that they are asked on these visits relate directly to the printing process, such as: "How does the pad pick up the image?", "How does the ink transfer to the substrate?" or "How can a flat artwork conform to a three-dimensional part?" The best way to answer these questions is to refer to the basic principles of pad printing and then apply these principles in practical ways where they are appropriate. This article will cover the fundamentals of this unique and flexible decorative process. This first section will include an examination of the key components that play critical roles in pad printing.

Transfer pad printing is considered an indirect gravure printing process as, like gravure printing, it employs an etched plate. However the plate does not come into direct contact with the substrate; instead the image is transferred to the surface by means of the pad. The benefits associated with pad printing are numerous, but it is most commonly recognised for its ability to print on three-dimensional surfaces. Common products that illustrate this feature include golf balls, syringe barrels, windshield wiper knobs, taillight lenses, consumer electronics and many other items.

BASIC ELEMENTS OF PAD PRINTING

The transfer pad printing process consists of four main elements: pad, cliché, ink and machine. It was the introduction of the transfer pad in the late 1960s that accelerated pad printing to its current status. The transfer pad, constructed of silicone rubber, is the key ingredient that enables printing on three-dimensional surfaces. Available in a variety of shapes and hardness (durometer), it is the job of the pad to pick up the ink image out of the cliché plate, act as a carrier, and then transfer the image to the part. It is the unique nature of silicone rubber that allows the pickup and release process to occur.

The second key element is the printing plate or cliché. The cliché is manufactured through a special photo-etching process and is available in an assortment of sizes and materials. The most commonly used steel cliché has a life expectancy in excess of one million cycles. Other temporary cliché materials can be used for shorter production runs and can even be manufactured at the user's facility. The choice between using steel or temporary clichés is based on volume and print quality considerations.

Pad printing ink, the third key element, includes a wide range of various inks, all designed specifically for the pad printing process. Due to the nature of this process, most clichés are etched to a depth of approximately one thousandth of an inch (.001 inch). With such an extremely shallow etched depth, the ink deposited within this space must be highly pigmented to obtain the necessary opacity. Thinners are mixed with the ink to control viscosity and to facilitate ink 'tackiness', a critical factor in the image transfer process.

The pad printing machine represents the fourth key element. Many machine designs exist but there are three basic configurations: the conventional open inkwell design, the rotary gravure process and the sealed ink cup system. As with the other key elements, variations exist within each of these categories.

THE PAD

The silicone rubber transfer pad, developed in the late 1960s, propelled pad printing to prominence as a leading decorative process used in a wide variety of industries. The transfer pad is available in a variety of shapes, sizes and hardnesses. Constructed of silicone rubber combined with silicone oil, the function of the transfer pad is to transfer the image from the printing plate (cliché) to the part. The shape, size and hardness of the pad work in combination to affect the appearance of the printed image.

Although it may not be obvious, there are two basic pad shapes that all transfer pads imitate. The first and most common design is the cone-shaped pad, which consists of a pad body with a defined tip. The pad body radiates down and away from the tip at a specific

A selection of round, roll and bar printing pads

angle. Most rectangular, square and oblong pads use this feature. The second basic shape is commonly referred to as a 'V-pad', which resembles a rooftop with an apex running the length of the pad. The pad body radiates outward and downward from the apex.

Transfer pads vary dramatically in size; the smallest can weigh a few ounces, while the largest can weigh more than 50 pounds. Pad size is determined by a number of factors, including image area and machine dimensions. Hardness or durometer is the third key variable in transfer pad design. Most manufacturers offer a variety of durometers to meet the diverse range of pad printing applications. At Trans Tech, five levels of durometer are available. When measured on a 00 scale, durometer ranges from 30 shore to 70 shore with each level progressing at 10 point increments.

PAD PERFORMANCE

The transfer pad is able to pull the image out of the printing plate due to the ink tack that is created as the cliché is doctored clean. As the pad compresses onto the plate a rolling effect occurs, which pushes air away from the image. Greater angles of descent enable less air entrapment, resulting in the elimination of pinholes. Conversely, shallow angles of descent prompt air entrapment and will result in the creation of pinholes. The same principle applies to the action of the pad compressing and then releasing the image onto the part.

For this reason it is best not to position the image on the tip of the pad. The tip represents a shallow angle of descent. Whether working with a cone or V-shaped pad, the image should always be slightly offset from the tip or apex. Transfer pads with highly defined tips and apexes (sharp radius) will provide better print quality than pads with slightly defined tips and apexes (shallow radius).

Continued over

ProPad printing pads

Sizing a transfer pad to a specific application requires a sufficient mass of silicone to avoid image distortion. As the pad compresses onto the printing plate and part, the print surface of the pad is absorbed into the pad body. The pad body acts as a support mechanism for the pad's print surface. If the print surface is not adequately supported, it will deform, resulting in image distortion.

It may seem that the simple solution is to oversize all transfer pads, however a few factors need to be considered before making this decision: firstly the transfer pad must fit into the machine, clearing all obstacles that are present (cliché holder, doctor blade holder, ink cup etc.) during the machine cycle. Secondly when compressed, the pad must not stretch into the ink buildup that is present on the cliché perimeter. Finally the machine must be capable of compressing the mass of silicone present. If these three criteria cannot be satisfied, then the pad is too large.

DUROMETER AND SILICONE RUBBER FORMULATIONS

Transfer pad durometer, or hardness, plays a key role in print quality; generally the harder the transfer pad, the better the print quality. A harder pad, when compressed, will maintain its shape much longer than a pad of the same design with a softer durometer. This retention of structure results in a better rolling effect and is therefore less likely to trap air.

There are variations in silicone rubber with each one exhibiting a specific performance characteristic. Trans Tech has four qualities of silicone material: the 'quality one' material, which has a yellow colour, provides the best print image but is limited in endurance. The 'quality two' white material is designed to be chemically resistant, which is not needed in the majority of applications. The third formulation, 'quality three', is the most commonly used; pink in colour, it provides the best combination of endurance and print quality. The 'quality four' pad is dark grey and is designed to provide anti-static properties. The effect with this material is minimal. The best results are obtained with the implementation of auxiliary anti-static equipment.

TRANSFER PAD MAINTENANCE

Transfer pad life ranges from 10,000 cycles to 100,000 cycles, depending on the application. The average life cycle is approximately 50,000 imprints. Print surfaces that are flat and free of ridges or protrusions will promote longer life than surfaces that contain these factors. Through extended periods of operation and contact with solvents that are present in ink, the silicone oil within the transfer pad becomes depleted. As the pad dries over time, its ability to pick up and release an image is severely reduced. Proper maintenance of transfer pads can significantly enhance pad life.

One easy step includes the use of silicone oil. After each shift, remove the pad from the machine and rub a small dose of oil onto the pad's surface then set the pad onto the shelf, positioned on its base. This will allow the newly-applied oil to penetrate the pad body, thereby replenishing the oil that is lost in production.

My second recommendation applies to those facilities that use a multishift operation. It is best to alternate pads and not let them be used in consecutive shifts. The combination of applying silicone oil with pad rotation will greatly enhance pad life.

PAD SELECTION

The first step in choosing the proper transfer pad begins with identifying the desired image size. Most transfer pad catalogues include image size capability with the individual pad illustrations. If the image size is 1 x 4 inches, then we need to choose a pad that has this capability. Remember that a pad with the capacity of 2 x 6 inches is a better choice than a pad with a capacity of 1 x 4 inches as it will probably be larger and be less likely to distort the image. However, be careful that the pad fits into the machine.

The next consideration will be the part's surface, specifically whether the surface is flat, curved, smooth or

A selection of DuraThon printing pads

textured. On a flat and smooth surface a standard durometer pad can be used. If the surface is flat but textured, a harder durometer pad is required. A pad with a harder durometer will do a better job of forcing itself into the bottom of the texture while retaining its basic shape. A softer pad will deform by expanding at the sides and will bridge the texture peaks at the print surface, leaving a void at the bottom of the texture. If a pad with a harder durometer is unavailable, a pad that uses a steep angle will perform the same function.

A part that exhibits a smooth surface but contains a radius typically requires the use of a softer durometer. The softer silicone will better conform to the part's surface. The radius of the part will act to increase the pad's angle of descent, reducing the potential for pinholes.

CUSTOM PADS

Custom pads are available from most manufacturers and are designed for a specific application. A custom pad may include a void in the centre to allow printing on a part such as the skirt of a range knob. Other designs have been manufactured to allow printing within an electrical fuse block. Custom pads must address the same issues discussed in this section. ■

This is the first of three parts of this article; to subscribe to future issues of Specialist Printing Worldwide, go to www.specialistprinting.co.uk

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ADVERTISING FEATURE

'New SuperDry technology means perfectly controlled inks' – Sihl

European imaging media group sets 'Oscar' quality standards with latest film successes

SIHL KNOWS A BIT about imaging media.

The market-leading Switzerland and Germany-based company (*part of the Italian Diatec Group*) has been a key force in European paper manufacture for 500 years - and a paper coating pioneer for the past 100 years.

Now a 300-strong workforce at the company's Duren location near Cologne in Germany, develops and produces a wide range of wide-format paper, photo, film and specialities for office and digital imaging applications. And at the 100-strong plant in Switzerland three ultra-modern coating systems produce inkjet specialities such as vinyl and banner, canvas and backlit products for customers worldwide.

Sihl created the innovative microporous SuperDry technology that's now setting new industry standards in products like the unique **SuperDry Display Film 165 (glossy 3473)**.

This new, easy to use and competitively priced, high-end, opaque white polyester film has the new technology built-in and provides customers with outstanding photographic quality results on all popular inkjet printing systems.

Sihl says that the rigidity of this robust new product guarantees perfect flatness even under varying climatic conditions.

Sam Iliaifar, SIHL Group UK Area Sales Manager says: "Our research showed that some display film users were missing the old Cibachrome (later renamed Ilfochrome) materials and so we decided to fill the gap with our new SuperDry Display Film 165. These films have a special antistatic backing and a high-gloss effect and are ideal for perfect photo reproduction in various sectors of the industry, including exhibition poster creation, display films for the POS sector, high quality photo reproductions, pop-up displays and packaging proofs."

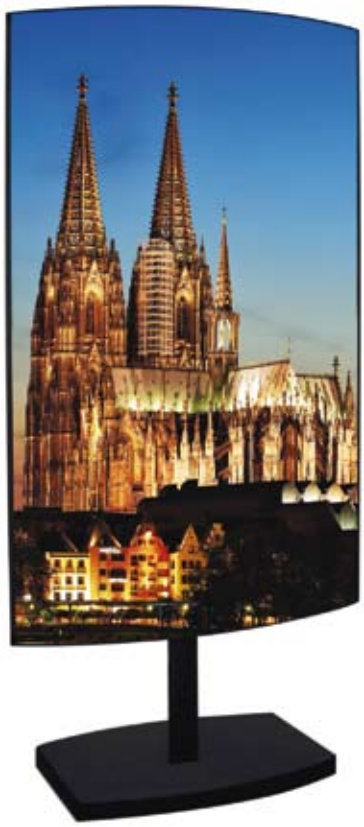
He added: "This polyester film (220g/m²) will suit all areas of high-end photo and graphic reproduction."

"Our SuperDry coating enables the inks to be perfectly controlled and guarantees they adhere more effectively to the surface of the medium. Within fractions of a second the SuperDry layer absorbs even large quantities of ink in a controlled way.

In addition the very high level of colour saturation achieved allows a very impressive colour gamut. Even the neutral reproduction of achromatic colours combined with very deep blacks guarantees a very three dimensional picture and a unique luminosity of the film."

SUPERDRY DISPLAY FILM 165: THE KEY BENEFITS AT A GLANCE

- Coating contains no optical brightening agents
- Antistatic matted reverse for optimum feeding and printing properties
- Extremely fast drying
- High degree of gloss
- Very high brilliance
- Homogenous surface
- Three-dimensional effect
- Perfect colour reproduction
- Good grey balance
- High colour stability



ADVERTISING FEATURE

- Excellent resistance to moisture and dimensional stability
- Scratch-resistant
- Universal ink compatibility
- Excellent laminating properties
- Optimum tear resistance

Sihl SuperDry Display Film 165 (glossy 3473) is available in reels in lengths of 20m and widths 432mm (17"), 610 (24"), 914 (36"), 1067 (42"), 1118 (44") and 1270 (50").

LIGHT BOX FILM SETS NEW BENCHMARKS TOO

Sihl's SuperDry Light Box Film 175 (satin 3461) which also incorporates microporous SuperDry coating technology – is causing quite a stir in the inkjet arena.

Notes Sam Iliaifar: "We've raised the bar with this new translucent polyester film which provides exceptional photographic quality in light box displays. And with perfect printer compatibility, easy processing and competitive pricing we are offering customers a unique package."

Sihl technology enables very high quality results on all well-known inkjet systems – and compares extremely favourably with lab-produced products.

He adds: "The very high level of colour saturation achieved allows a wider colour gamut, and even the natural reproduction of achromatic colours combined with very deep blacks, guarantees an exceptionally three-dimensional picture and a unique luminous quality."

The printed film is also characterised by soft transitions of colour with high resolutions and excellent contour definition.

The SuperDry layer absorbs even large quantities of ink in a controlled way within fractions of a second.

The colouring agents; pigments or dye-based inks, are fixed to the surface and water and other ink components are drained off through microscopically fine channels.

Key features include:

- Extremely fast drying
- Antistatic reverse side
- Coating contains no brightening agents
- Three-dimensional effect
- High colour stability
- Perfect colour reproduction
- Homogenous surface and attractive semi-matt gloss
- Excellent grey balance
- Excellent resistance to moisture and scratches
- Excellent laminating properties
- Universal ink compatibility

Sihl product manager Stefan Bruch comments: "This 225g/m² film is exceptional, not only in terms of superior photo-quality – it also scores top marks when it comes to processing and versatility.

The stiffness of the polyester film guarantees optimum flatness and tear-resistance – and thanks to its dimensional stability and resistance to moisture and temperature, this material is perfect for all areas of high-end photo and graphic reproduction."

He adds: "As photography progressively frees itself from the constraints of the laboratory, Sihl introduces, for the first time, a film that produces results that surpass those of the silver salt technique. Object art with permanent background lighting for photographs faltered due to limited availability of suitable materials. But now Sihl is resolving that problem. Complete with a translucent light dispersion layer on the reverse side, this film is simply mounted in a light box or light display with no additional light dispersion glass."

Sihl's SuperDry Light Box Film 175 (satin 3461) is available through UK distributor Image2Output, in 20 metre reel length and widths: 914mm (36"), 1067mm (42"), 1270mm (50"), 1372mm (54") and 1524 mm (60")

For more information about these and other Sihl products contact Sam Iliaifar at siliaifar@diatechnologies.fr and see the Sihl website at www.sihl.com. ■

DON'T EMBOSS – PRINT INSTEAD

Annette Finn describes a new UV inkjet printing system that has been developed to meet forthcoming requirements for pharmaceutical packaging to carry information in Braille

EMBOSSING REMAINS INTACT BETTER THAN PRINT – at least that is what printing companies have firmly believed until now when it comes to applying Braille onto packaging. Atlantic Zeiser, supplier of digital printing and encoding systems, recently launched its own solution for printing Braille using inkjet technology. The Braillejet and Braille Vision solution comprises a high quality printing system for UV inkjet printing and a new, integrated camera control system. The benefits of UV inkjet printing include superior adherence to a wide variety of substrates, transparency, contour fidelity, accuracy and excellent durability.

The technical challenges of printing and personalising packaging with Braille, which have represented significant problems for the industry, are not the only factors behind the new development: by October 2010, all medicines sold through retail in the European Union (EU) must have Braille marking on the packaging to accommodate the needs of blind and visually challenged people.

MICROVALVE TECHNOLOGY

Atlantic Zeiser collaborated with Swiss technology partner Gyger, based in Thun, to develop a suitable printing technique. The microvalve technology developed by Gyger has its origins in various applications such as Drop-on-Demand (DoD) inkjet, analysis technology and metering technology. Experience in these fields of application was applied directly to the new environment of Braille marking. In co-operation with a Swiss college, Gyger conducted the basic development and project work necessary for achieving the resultant microvalve technology.

The Braillejet print head prints two lines of Braille simultaneously

This technology has since attracted a lot of attention in the packaging and labelling industry because it enables Braille letters to be printed using high-viscosity UV-cured ink in order to achieve immediate fixation of the dots. One print head prints two lines of Braille simultaneously and it is possible to increase the number of lines through the easy installation of additional print heads; the result is optimal legibility and exceptional dot clarity. The height of the dots is adjustable between 0.2 and 0.4 mm and the diameter is 1.6 mm.

ADVANTAGES

There are currently no other digital Braille systems on the market. Until now, Braille has been produced using screen printing or embossed printing on cartons. In terms of performance, flexibility and operation, however, traditional technologies are not comparable with digital Braille. The Braillejet digital inkjet printing solution offers a number of significant improvements compared with earlier technologies for printing Braille for commercial or industrial applications. Problems such as the high set-up costs associated with screen printing and the lack of transparency with printing inks are eliminated with this solution. Relief embossing is limited to packaging and new embossing tools are required for each job, increasing time and cost.

There are too many restrictions with traditional technologies; the solution offered by Atlantic Zeiser satisfies many manufacturer requirements in today's difficult market, including the demand for superior print quality, while saving time and cost.

Braillejet delivers the flexibility to produce short runs and execute fast job change-overs, along with the ability to work easily with variable data. Other benefits include:

- a high degree of flexibility of use: Braillejet and Braille Vision are available as an integration package or in combination with a transport system (both web and sheet-fed transport systems are available)
- a complete system solution from a single source comprising a printer module, UV dryer, inks and camera system
- digital printing technology which enables the production of small batches
- digital printing allows the printing of variable data, such as dates; this individualised marking is a key advantage over screen printing and embossing
- UV inkjet printing ensures high quality in terms of contour and edge definition
- with its compact print head and camera design, the Braillejet solution can be easily integrated into an existing system
- short make-ready times allow fast job change-overs
- for the font type, Atlantic Zeiser uses Marburg Medium which is the standard in Braille.


Braille Vision's inline camera provides complete quality control of the production processes

Braillejet's high-viscosity, UV-cured inks achieve immediate fixation of dots

SETTING NEW BENCHMARKS

Flexibility is of utmost importance when it comes to Braille printing. Braillejet is offered as a complete, flexible system solution that includes a print module and UV dryer. The main advantages of the solution are the excellent price-performance ratio and its compact design which facilitates installation in most production environments. The new Braille Vision solution, which provides the complete quality control that customers demand, can be easily integrated to monitor production processes.

Braillejet can be installed in a wide variety of technical environments, including label manufacturers and packaging printers, suppliers of finishing systems such as Prati, Rotoflex and AB Grafics, and suppliers of folding machines. Based on the EU directive relating to pharmaceutical labelling which is due to come into force soon, it is assumed that Braillejet will be used primarily for pharmaceuticals packaging; however the system is also suitable for printing on industrial products such as bottles, signs and switches, as well as being used to improve the tactile properties of a substrate's surface – its finish and slip resistance.

IN COMBINATION WITH PRINTING SOLUTIONS

Braillejet can be readily combined with the Omega inkjet printing solutions from Atlantic Zeiser, which is especially useful for the manufacture of booklet labels as an increasing number of pharmaceutical manufacturers now shrink-wrap package inserts and stick them directly onto the product.

Since it is not possible to code these uneven labels with varying thicknesses using a traditional guiding system, Atlantic Zeiser has developed the Booklet Web Line which is capable of applying product and patient information in crease-free booklets up to 80 pages thick onto practically any container. This is facilitated by a specially developed roller transport system so that the inkjet print head can be positioned vertically and swivelled slightly to the side to enable optimal alignment with the print substrate.

The metering technology used on the Braillejet system allows for the inline application of Braille onto ready-made booklet labels; the Booklet Web Line offers an optimal combination of both printing technologies within one compact system which can be extended with readback systems (Unique Vision) for product monitoring.

EQUIPPED FOR THE FUTURE

Atlantic Zeiser states that, at trade shows and industry events, it receives a lot of queries from label and packaging printers as well as product marketing professionals who are struggling to find the right solution to meet today's ever-growing requirements. Often the customer's main concern is not the type of printing technology involved, but factors such as cost, ease of use and flexibility.

So Atlantic Zeiser felt it was important from the outset to create a complete package for Braille printing comprising printer, UV dryer, UV inks and readback camera. The special inks and adapted optical camera filters combined with adjustable lighting add to the system's attributes. In developing Braillejet, Atlantic Zeiser benefited greatly from its decades of experience in the use of camera systems in the industries it has served so far, such as security print, commercial print and management of security-related data for passport manufacture, ID cards and banknotes. ■

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UV AND UV LED TECHNOLOGY EXPLAINED

JFX-1631 UV LED curing flatbed inkjet printer

Sabine Slaughter explains the difference between UV and UV LED technology when used in large and super wide format printers

INKJET PRINTING IS A COMPLEX TECHNOLOGY encompassing machines, printheads, inks and substrates, all of which need to complement each other in order to achieve good results. The applications play an important role in determining which large and super wide format printer is most applicable.

Inkjet is a non-contact printing method for highly precise direct printing on concave, convex and flat material surfaces. Traditional screen printing and pad printing methods have difficulties printing on uneven surfaces, however brilliant colours, full-colour photo image data and even smooth gradations are achieved by inkjet printing methods.

UV CURABLE INK

Inkjet printers using UV ink have to cure the ink because UV ink incorporates monomers (low molecules) – a kind of liquid with very small molecules that need to be fused together in a process called polymerisation in order to be firmly fixed onto the material. When the particles are exposed to UV light they are cured, which means the molecules are fused together to make them also adhere to the substrate. This polymerising reaction is called monomer binding.

UV curable ink, which cures soon after printing, does not usually contain VOCs (Volatile Organic Compounds) and is therefore environmentally friendly. Direct printing on non-absorbent materials is made possible since the coated layers of the resinous polymers produce printed images on the surface of the materials. The ink is instantly dried after irradiation with UV light; this explains why UV ink does not seep into the surfaces and ink penetration is kept at a minimum.

UV ink enables print service providers to print on many types of plastics as well as different substrates, offering a broad spectrum of applications. However the UV lamps used in this process generate a lot of heat which restricts the kind of substrate that can be used for UV printing. In addition the whole UV light spectrum is output, resulting in high power requirements.

	UV lamp	UV LED
Power consumption	High	Low
Lifetime	Short	Long
Heat generation	High	Low
Printable substrates	plastics, papers, glass, carton, concave and flat substrates, polyesters, foam board, styrene, wood, stone, polycarbonates, acrylics, PVC, aluminium, metal	plastics (including heat-sensitive plastics), vinyl, banner, canvas, films, membrane switches, papers, glass, carton, concave and flat substrates, polyesters, foam board, styrene, wood, stone, polycarbonates, acrylics, PVC, aluminium, metal
Applications	accessories (leather belts, etc), art reproduction, backlit graphics, construction signs, displays, exhibition signs, lenticular, ID cards, logos (3D), operation panels, relational gifts, clothing accessories, golf balls, machine name plates and operation panels, magnets, mobile phone covers, pens, novelties, giveaways, signs, stickers, gift articles	floor graphics, vehicle wrapping, posters, banners, indoor graphics, labels, films, accessories (leather belts, etc), art reproduction, backlit graphics, construction signs, displays, exhibition signs, lenticular, ID cards, logos (3D), operation panels, relational gifts, clothing accessories, machine name plates and operation panels, novelties, giveaways, signs, stickers, gift articles
Environmental impact	High	Low

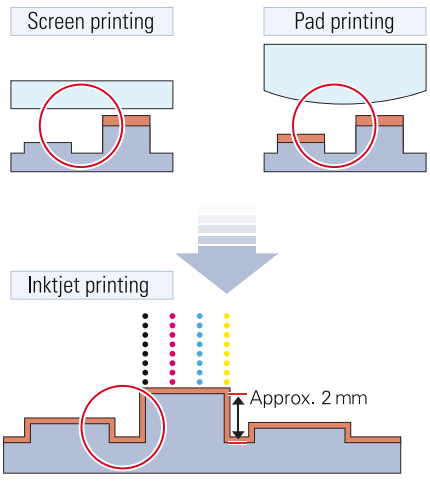
A comparison of UV and UV LED

CURING WITH UV LED

Newer printer developments, such as Mimaki's UJV-160 and JFX-1631, use another radiation source for the curing process: UV LEDs. These consist of UV light-emitting diodes that emit rays within a narrow UV light range. Inks whose monomers have been sensitised to this specific range can be cured with the same process as with UV lamps. As UV diodes do not generate heat, many more substrates – such as membrane switches, heat-sensitive PVC and other plastics, films and papers – can be printed on, broadening the choice of applications that can be produced on a printer.

The warm-up and cool-down time of UV lamps is eliminated as UV LEDs can be switched on and off immediately. Power consumption of the respective UV LED machines is decisively reduced as the LEDs need less power and can be switched off when not needed. The lifetime of UV LEDs is five times higher than that of conventional UV lamps, and UV LEDs do not omit ozone.

Mimaki has a wide range of UV inkjet solutions in its portfolio, as well as a new UV LED hybrid large format printer, the UJV-160. High image quality is ensured with variable droplets and a resolution of up to 1200 x 1200 dpi. To accommodate different media



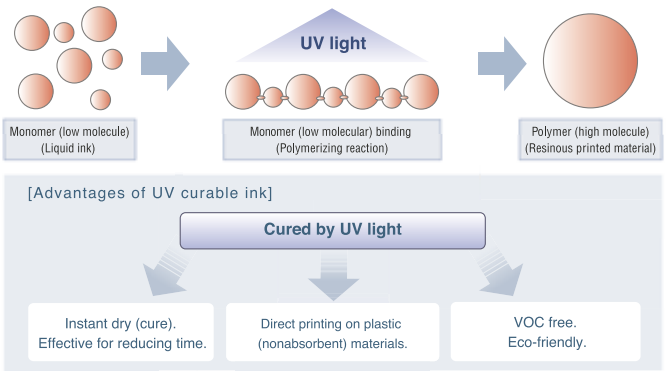
The non-contact printing principle

thicknesses, an automatic head height mechanism is used to avoid head strikes. The UJV-160 comes complete with two tables for feed and delivery, enabling print service providers to print on light rigid materials as well as roll to roll.

REDUCING ENVIRONMENTAL IMPACT

Recently Mimaki introduced the JFX-1631, a flatbed inkjet printer (printing size up to 1602 x 3100 mm) which also uses UV LED-technology, making it very environmentally friendly. The machine is engineered for highly precise printing using Mimaki's IMS (Intelligent Microstepping System). Further benefits include automatic nozzle failure detection, a vacuum table for easy loading, unloading and precise material hold, and eight new print heads to enhance printing speed.

Mimaki's UV flexible inks for UV LED printing do not crack when bent as their surface tension can tolerate expansions of up to 200%, thus making them ideal for printing on uneven and curved surfaces or products that need to be altered when post processing. For the UJV-160 Mimaki offers new reusable 600 ml ink containers which further reduce environmental impact.



The UV curing process

UJV-160 UV LED curing hybrid inkjet printer

Mimaki also offers UV LED hard inks including white for printing on even surfaces. Mimaki's white over- and underlay printing functions on both UV LED technology machine families gives printers the opportunity to enhance images even further, as white underlay print, especially on transparent and coloured media, enables far better image reproduction, resulting in even higher quality prints. ■

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SCREEN PRINTABLE FILMS BRING NEW OPPORTUNITIES

Laura Bullmore explains how the latest generation of film substrates can help screen printers diversify and beat the recession

THE FINANCIAL CRISIS HAS HIT the screen printing industry hard. Even before the economic downturn screen printers were already having to cope with low cost competition and the rise of digital technology; now, with their customers' budgets being squeezed ever tighter, screen printers are having to adapt to survive.

The good news is there are opportunities available for printers willing to diversify into areas where quality remains a priority. In these specialised high value markets such as electronics, healthcare and telecommunications, budget printers are unable to satisfy the needs of customers and therefore competition is less fierce. Where there is a demand for precision printing, specialised finishes and fast turnaround, screen printers can prosper.

To meet these requirements and remain competitive, the right materials are essential. One area that offers considerable potential is screen printable film technology. A wide range of substrates are now available that solve specific problems, such as reflection and glare, graffiti and physical damage, and the risk of infection, while offering new opportunities in component production and surface finishes.

COUNTERING REFLECTION AND GLARE

Key to achieving these properties are the hard coated outer layers of the films. These layers are chemically bonded, at a molecular level, to conventional polyester or polycarbonate substrates. The result is a film that combines the mechanical characteristics of the substrate with the unique properties of the coating. As well as being resistant to scratches and abrasions, the coatings resist common cleaning chemicals and solvents, offer good optical characteristics and allow the films to be handled easily using normal printing, cutting and installation techniques.

New hardcoat surface finishes mimic metallic effects

An important characteristic that can be specified in these new films is the ability to minimise reflection and glare. This is particularly useful for products and displays that need to be viewed easily in different light conditions and environments, such as handheld devices or electronic displays.

ANTI-GRAFFITI

This latest film technology can also help protect screen printed displays against vandalism. Film materials are now available that make it considerably easier to clean away graffiti without affecting the surface finish of the display or reducing its quality, colour or clarity. The specially developed hard coat layer enables graffiti to be removed quickly and simply using conventional isopropanol solvents or aqueous detergents. Unlike conventional display materials that can become permanently damaged after cleaning, the new films can be restored without damage or degradation.

When specifying an anti-graffiti film it is important to look out for ASTM D 6587 certification, which shows that a substrate has passed industry standard testing. This is especially important for larger scale or high value projects where it is essential that the materials used meet the required performance criteria. For example, a recent project at a major UK railway station used over 1000 m^2 of MacDermid's SIGMAGraff Shield for a large advertising hoarding in a main concourse. It was vital that the film could offer anti-graffiti protection as well as a UV resistance, the ability to be printed using conventional inks and a minimum life of 15 months.

MAINTAINING HYGIENE STANDARDS

Screen printed control panels and displays used in hygiene-critical environments can contribute to the spread of harmful bacteria if standard film materials are used. To resolve this problem, anti-microbial protection can be designed into the latest films through sophisticated hard coat technology.

Products such as Autotex AM film or SIGMAGraF AM with Microban technology make it possible to reduce the threat of infection from MRSA, Salmonella Enteritidis, Escherichia Coli and Listeria Monocytogenes, as well as inhibiting the growth of mould and mildew. The anti-microbial agent is distributed throughout the films' hard coating as part of the production process. As a result, the anti-microbial properties last for the lifetime of the film.

These films are particularly beneficial in medical environments and food preparation and storage areas. They can be used as a safer, more hygienic alternative anywhere that traditional materials would normally be used – from equipment control panels to displays or coverings on walls and doors. By combining this new film technology with strict cleaning processes, the spread of bacteria can be prevented in hygiene-critical environments, protecting both staff and visitors.

SPECIALISED FINISHES

The new films provide countless possibilities for achieving specific finishes. Substrates are available with either a high gloss, antiglare or matt textured outer surface depending on the requirements of an application, and new finishes are being introduced all the time.

For instance, MacDemid Autotype has recently launched its Autotex Steel film, a textured polyester film developed to replicate a stainless steel finish. As with all the films in the Autotex range, the second surface is receptive to screen printable graphic inks and when printed with mirror inks, produces an exact replication of stainless steel. This is just one example of the latest innovations in specialised finishes; a whole range of textures and appearances can now be achieved using hard coat technology.

IN SUMMARY

The latest generation of film substrates can be extremely useful to screen printers looking to diversify their operations and expand into new markets. Regardless of their specific characteristics, all the films are designed to be reverse screen printed, opening up many new opportunities for printers. By understanding the film technology available and working with customers to help them find the right solution, printers can proactively offer a simple and affordable way for customers to solve specific problems, helping them stand out from the competition and prosper in these challenging times. ■

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UNDERSTANDING CPSIA

Elaine Campling outlines and explains The Consumer Product Safety Improvement Act (CPSIA) 2008

THE CONSUMER PRODUCT SAFETY IMPROVEMENT ACT (CPSIA) 2008 is US-enacted legislation designed to regulate the safety of products manufactured and imported for sale in the USA, mainly targeted towards consumer products designed for children. The Act restricts the use of certain chemicals in children's products, which must be verified by testing and accompanied by certification. Virtually all products on sale in the USA intended for children under the age of 12 are affected by CPSIA, which is regulated by the Consumer Product Safety Commission (CPSC).

The Legislation has been enacted against a backdrop of high profile safety concerns about chemicals in toys and other childcare articles, alongside a number of product re-calls. Chemical preparation manufacturers and printers may have received information requests from their customers, particularly concerning the presence of lead and phthalates in their products, due to regulation of these substances.

WHAT THE ACT SAYS

The CPSIA requires that children's products do not contain more than 600 ppm total lead, which decreased to 300 ppm in August this year and will be further reduced to 100 ppm for compliance in 2011, unless in the meantime CPSC determines that it is not feasible to achieve this limit, in which case the lowest achievable limit will be set. Some exceptions are possible, if it can be demonstrated that any lead in the product is not accessible to the child. The Act also limits the permissible lead content in surface paints and coatings for consumer use to 90 ppm, a reduction from a previous 600 ppm limit.

CPSIA introduces a new requirement prohibiting the use of certain phthalates above 0.1% in children's toys and childcare articles: 'children's toys' include products "designed or intended by the manufacturer for a child up to age 12 for use by the child when the child plays". Childcare articles are defined as "a consumer product designed or intended by the manufacturer to facilitate sleep or the feeding of children up to age 3, or to help such children with sucking or teething".

Phthalates are generally used to plasticise or soften vinyl products to make them flexible. Three phthalates are subject to a permanent 0.1% restriction:

- benzyl butyl phthalate (BBP)
- dibutyl phthalate (DBP)
- bis-(2-ethylhexyl) phthalate (DEHP).

An interim 0.1% limit is applied to the following phthalates, but the CPSC is yet to decide whether to make the restriction permanent:

- di-isodecyl phthalate (DIDP)
- di-isononyl phthalate (DINP)
- di-n-octyl phthalate (DnOP).

The interim ban on DIDP, DINP and DnOP applies only to children's toys that can be placed in a child's mouth: "A toy can be placed in a child's mouth if any part of the toy can actually be brought to the mouth and kept in the mouth by a child so that it can be sucked and chewed. If the toy can only be licked, it is not able to be placed in the mouth. By definition, if a toy or part of a toy in one dimension is smaller than 5 centimetres, it can be placed in the mouth."

ESTABLISHING COMPLIANCE

The CPSC will appoint a Chronic Hazard Advisory Panel (CHAP) to review the potential effects on children's health of all phthalates and phthalate alternatives in children's toys and childcare articles. CHAP will also consider the cumulative effects of exposure to multiple phthalates from all sources, including personal care products.

CPSIA stipulates that third party testing is necessary to establish compliance with the limits for lead and phthalates. The Act also sets out a requirement to test one product of each model or style, which must be tested in its entirety. The test requirements were to take effect in February this year, however due to lobbying by small businesses, the new testing and certification requirements will be delayed to February 2010 while CPSC considers whether alternative testing methods might be appropriate and whether it is reasonable to exempt some materials or products from testing.

Manufacturers and importers must still ensure that their products meet the new lead and phthalate limits, but have more time to get organised. In the meantime, this is likely to shift the burden of responsibility to component part manufacturers. However, all children's products are still required to have a certificate that states compliance with the lead limit in paint and surface coatings.

THE LAW IN EUROPE

Lead and other heavy metals are restricted for use in Europe under Part 3 of EN 71, The Toy Safety Standard, which also defines requirements for testing the migration of inorganic elements. In Europe, The Marketing & Use Directive (amendment 2005/84/EC) also restricts the use of the phthalates regulated by CPSIA. In some ways the Directive is more prohibitive, limiting the use of BBP, DBP and DEHP in all toys and childcare articles, regardless of age. DIDP, DINP and DnOP are restricted in products for the under-threes.

Phthalate	CAS No	Limit
BBP	85-68-7	0.1% by mass of plasticised material in toys and childcare articles
DBP	84-74-2	
DEHP	117-81-7	
DIDP	26761-40-0 68515-49-1	0.1% by mass of plasticised material in toys and childcare articles intended for children under three years of age and which can be placed in the mouth by them
DINP	28553-12-0 68515-48-0	
DnOP	117-84-0	

DPB, DEHP and BBP are also Candidate List substances which may eventually be subject to restriction or authorisation under the REACH Regulation (see *Specialist Printing* issue 2, 2009).

EFFECTS OF REGULATION

No-one can argue against the importance of protecting children, and consumers in general, from the potential effects of harmful chemicals, recognising also the importance of protecting the environment. There have been many high profile media reports of exposure to chemicals in a variety of consumer products.

In some instances the 'precautionary principle' has been applied to chemical regulation (as noted by regulators), particularly because the scientific evidence is not conclusive. However it is difficult to regulate the unregulated and perhaps better consumer education is required to promote improved understanding or awareness of safety compliance labelling and recognition of potentially unsafe products.

For industry the plethora of regulation is often confusing, conflicting and non-harmonised, both for manufacturers and their customers, which also leads to differing customer standards. Global standards clearly setting out the requirements with standardised test methods would help to promote the consumer safety standards that are the obvious goals of government and all interested parties. ■

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SUSTAINABILITY IN TEXTILE SCREEN PRINTING

Edward Branigan examines the role and future possibilities of phthalates and plastisol inks in screen printing applications

THE MOVEMENT TOWARDS ENVIRONMENTAL PROTECTION AND sustainability has garnered much press and media attention in recent years. It really is a movement that is directing change, and the change has already occurred, and not just in the textile screen printing market – we are seeing it cut across all market sectors. At this point, it's odd not to be making some effort towards using sustainable practices in our production facilities and workplaces.

In the USA, the Consumer Product Safety Improvement Act 2008 and similar laws in California and other states restrict the use of certain phthalates in children's toys and childcare articles. The European Union (EU) has had restrictions on phthalates in place since 1999. This ubiquitous chemical compound is now driving change in the garment printing world.

In the recent past, the demon seemed to be PVC. In response to calls for its ejection from ink systems and pressure from some of the bigger players in the retail fashion world, in particular those orientated towards sports, PVC-free plastisol ink lines, including high density ink, were developed – but these inks are priced well above traditional PVC plastisol inks and are only now catching up in performance. Because of this and its general versatility, PVC plastisol has still managed to maintain a strong market presence.

ORTHO-PHTHALATES

The emergence of phthalates as an issue has brought the constituent elements of plastisol inks under the microscope again. What is a phthalate and why is it important in textile printing? Phthalates are a family of chemical compounds that are primarily used to soften PVC and make it flexible. There are different types of phthalates, with some considered more problematic than others. Phthalates were first developed and used in the 1930s but didn't become widespread until the 1950s. They can be found in inks and many other consumer products including toys, adhesives, detergents, flooring, deodorant, shampoo and cosmetics. They are in the coatings of migraine tablets and in the dashboard and console of cars.

The concern with phthalates centres around a particular chemical class: ortho-phthalates. It has been suggested that ortho-phthalates may disrupt the endocrine system in laboratory test animals. Phthalate plasticisers are not chemically bound to PVC so they may leach out; the fear is that young children and infants will chew on or place a toy or item containing phthalates into their mouths and absorb some of the chemicals into their bodies.

Although the recently-enacted legislation in the USA restricts the use of 6 ortho-phthalates, there is suspicion of many or all phthalates. Some end-users now demand inks that are free of phthalates but with the attributes of phthalate inks; they also ask many more questions about the chemical composition of inks in general and are often surprised by the answers.

A special effects plastisol application with raised texture and foil

Multiple foil application showing adhesion properties of plastisol

An example of multiple application possibilities with plastisol including soft hand, raised texture, metallics, foil and flock adhesion

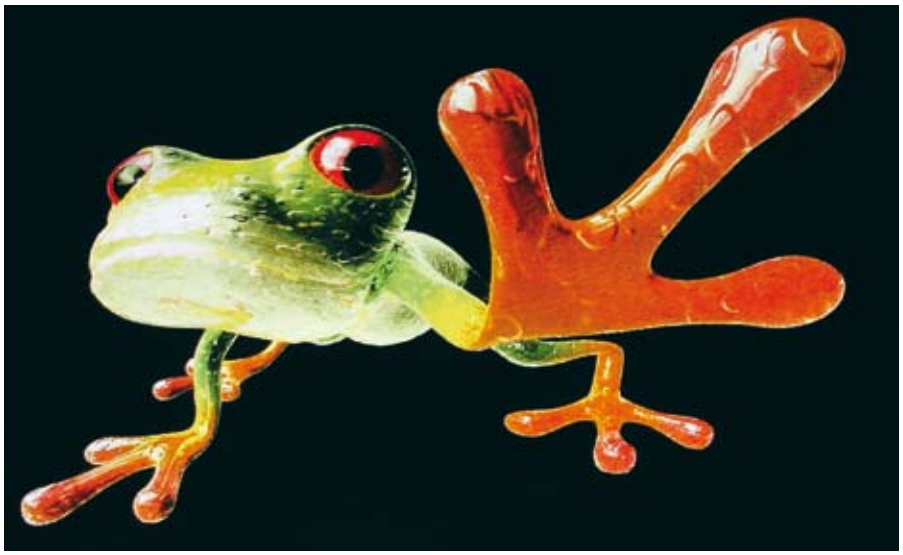
WATER-BASED INKS

It used to be that the common response from printers when asked to use more 'earth-friendly' inks was to reluctantly switch to water-based products. Water-based inks are more difficult to use than plastisol inks but at least they're mostly water. There are some additional qualifiers that should be recognised.

Many people do not realise that some water-based inks contain 70-80% water and therefore don't offer the same yield as plastisols, which are 100% solids. In other words, most of the content of water-based inks evaporates away leaving 20-30% solids on the garment, whereas 100% of the plastisol inks printed on a garment remain after curing. In addition, some water-based inks contain solvents such as formaldehyde or alcohol which vaporise when cured.

Independent of an ink's content, one of

Continued over



High solids water-based ink with a high degree of opacity

the criteria in measuring sustainability is the amount of water used during the manufacturing process, both in the making and the cleaning up. Water-based inks 'consume' a lot of water and can be 70-80% water. Water is used to clean up these inks, so no harsh solvents or chemicals are used for this, but I would argue that most water-based inks should not really be viewed as sustainable products.

SOLIDS IN WATER-BASED INKS

The content of the 20-30% solids portion of water-based inks consists of resins, pigments, binders and additives and in some cases, water-based inks also contain biphenyls, chlorinated hydrocarbons, heavy metals and pesticides. These inks can release VOCs during the curing process. For a water-based ink to cross-link completely, the water needs to be completely evaporated from the ink, so garments are often in the dryer for a longer period of time than they would be with plastisol. It could be assumed that as well as the water, other compounds are gassed off, particularly if the inks contain solvents.

However there are water-based inks currently on the market that do not match this description – in particular, new high solids water-based inks (up to 70% solids content) are available with none of the agents mentioned above and the ability to resist drying in the screen. These attributes make them more attractive as an alternative to plastisol.

A water-based discharge print

The advent of closed filtration systems for cleaning screens after use means that with these systems, any liquid used for cleaning is re-circulated after the solid content has been sieved out, so nothing goes down the drain – any solid or liquid waste is removed and disposed of according to local toxic waste regulations. These filtration machines can be used for water-based or plastisol ink systems. Filtration systems such as these are expensive, however.

PLASTISOL TEXTILE INKS

Although recent advances have renewed interest in water-based inks as a viable printing alternative to plastisol, there are characteristics and a variety of application methods available to plastisol that water-based inks cannot mimic. Plastisol textile inks can be reduced to achieve the same soft hand feel as water-based ink; they can also be textured and raised in ways that water-based inks cannot.

Direct to garment digital printing is now a greater competitor to flat screen prints and will continue to be so. The ability to achieve a full colour print on a dark shirt with optimum opacity using digital technology is almost here. The possibility of soft hand prints with full colour on light or dark fabrics without the use of inks and screens is a very attractive idea. There are a variety of garment application methods available to plastisol that are not possible with digital printing, so a merging of the two technologies at the print production end offers much promise and seems most practical for garment printing.

There are automatic screen printing machines currently available that incorporate both screen heads and a digital head. For sustainability, direct-to-garment digital would seem to be a winner as there is no film to output, no screen emulsion or inks to use and none of the attending solvents or chemicals used to manufacture these necessary tools, and no clean-up and disposal.

While it is possible to print many types of special effects on garments using water-based inks, garment printing is set to stay as the main use of plastisols for a while yet. The versatility and long shelf-life of plastisol inks make them very attractive for large scale production garment printing. PVC in general is not going anywhere, but its primacy in the garment printing world is possibly questionable. The phthalates that soften the inks can be dispensed with if necessary.

NON-PHTHALATE PLASTISOL

Many of the major US ink manufacturers offer non-phthalate PVC plastisol ink ranges. This new generation of non-phthalate plastisol, like its PVC-free cousin(s), used to be price-prohibitive for many end-users, but this is changing as more plasticiser choices become available.

The questions on ortho-phthalates keep getting asked, and demand and interest for non ortho-phthalate inks is consequently growing. The recent restrictions on phthalates imposed in the USA for textile print applications only applies to products destined for young children and infants, not for adults, yet the demand amongst end-users for phthalate-compliant inks for all sizes and ages is rising, regardless of the legislation and in spite of the higher cost. More rigorous testing will doubtless take place and phthalates in particular will be studied further to determine their environmental impact, but the market will ultimately determine the inks used.

In the USA the direction that sustainability will take is being worked out by consumers, retailers and the print manufacturers that serve them. PVC plastisol inks are still very much favoured in spite of the fact that the phthalate issue has brought them under renewed scrutiny. In the end, it will probably come down to price. The non-phthalate and PVC-free plastisol ink systems are ready for when demand rises and once it does, we may end up saying goodbye to PVC in our plastisol, just as we are now doing with phthalates, and did in the past with lead.

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BIO-INKS FOR PACKAGING

Sergio Molino details the joint research project that aimed to make green labelling possible

AT LAST YEAR'S CONTEST AT THE Salon internationale de l'emballage (Emballage 2008), the Goglio Group, a leading company in the field of flexible packaging and packaging machine manufacturing, launched the first label made of renewable materials and printed with a bio-ink so it was totally biodegradable. The project originated from an exclusive co-operation between certain research and development (R&D) departments, including the Kiian Group which participated with the ink.

Green-Label is designed to change the flexible packaging market. The project generated wide interest amongst visitors, capturing the attention of well-known brands in the food and beverage market segment which were excited by the new development. In particular the project met the expectations of the makers of Sant'Anna natural mineral water, which asked the Goglio Group to produce a biodegradable label which could then be used with a biodegradable bio-bottle in just 80 days!

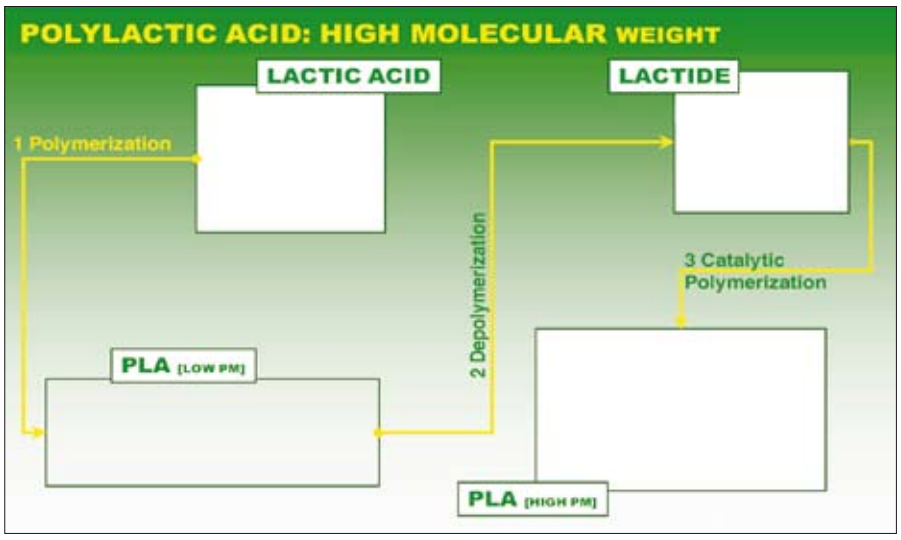

Figure 1

PLASTICS AND BIO-PLASTICS

A large part of many packaging materials cannot be recycled and are not bio-degradable, and they are mainly plastics. For clarification, each class of packaging is defined:

Recycling materials are those which can be used again for other purposes, such as glass, aluminium, carton and paper. Packaging should not be marketed as recyclable unless it can be collected separately or otherwise recovered from the solid waste stream for re-use in manufacturing or in the assembling of another package or product through an established recycling programme. These types of products are distinguishable from other packaging materials which display a significant resistance to biological degradation (for instance, an ordinary plastic bag takes more than 100 years to decompose).

Compostable and biodegradable materials both derive from biological raw materials which are able to decompose by natural processes (i.e. biodegradable), achieving total disintegration in a relatively short time (i.e. compostable).

Biodegradable polymers (BPs) can be divided into three different classes:

- Polymers deriving from biomass production (e.g. cellulose derivates and starch)
- Synthetic polymers such as PLA (Polylactic acid) or cellulose
- Polymers deriving from micro-organisms.

For the project Kiian concentrated its efforts on developing an ink that is suitable for PLA, as each class of BPs requires a customised ink.

COMPOSTABLE FILM

Polylactic acid is a Thermoplastic-Aliphatic-Polyester derived from corn starch (mainly in the USA) or sugarcane (mainly in the rest of world). The chemical process to synthesise PLA starts with bacterial fermentation producing lactic acid which, via heat curing, is transformed into PLA with a low molecular weight. This molecule is the starting point towards synthesising PLA with a high molecular weight, which is produced by the lactide monomer obtained from the de-polymerisation of PLA (with low PM) and the subsequent catalytic reaction.

PLA's chemical features are excellent transparency, a high resistance to UV rays and a high barrier effect towards odours and aromas. It is a sustainable alternative to petrochemical-derived products, although it is more expensive than many petroleum derivatives. PLA is used in a wide number of biomedical applications and in the preparation of bio-plastic for packaging (for compost bags, food packaging and disposable tableware). It is also used in fibres and non-woven textiles in a diverse range of potential application fields such as furniture upholstery, disposable garments and nappies.

THE GREEN LABEL RESEARCH PROJECT

Kiian was one of the R&D partners in the project to develop the first totally biodegradable bio-bottle. The challenge for the Kiian Group was to shift from the traditional ink concept, where each component plays a key role in the final balance formula (see figure 2), to the new one.

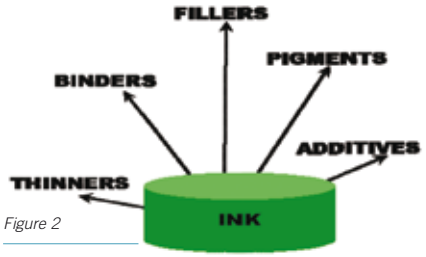

Figure 2

The bio-ink formula has the same framework as a traditional one but is based on chemical components derived from renewable sources which have completely different chemical and physical properties. For this reason it was necessary to undertake a thorough study of the raw materials and their reactivity to achieve a final formula which was effectively balanced.

The parameters defined as necessary to

reach this target were:

- Constancy of viscosity: should be comparable with that of traditional inks, commonly used in gravure, in order to assure better transference from the printing cylinder to the substrate, and high printability.
- Colorimetric yield: should be comparable with that of traditional inks, so as to maintain the same printing parameters in the production process.
- Good adhesion: should be the best possible to completely maintain the biodegradability properties of PLA and have the same values as printing with a traditional ink.

RESULTS OF THE PROJECT

At the end of the testing period the ink that was developed displays the following main features:

- Printability, constancy of viscosity and colorimetric yield: these are wholly aligned with those of traditional inks that are mainly used in gravure, so as to give the printing parameters applied in the actual production process.
- Good adhesion: the high level reached by the ink printed onto PLA has been able to pass all the tests.
- Biodegradability: this is equivalent to that indicated for the PLA in the UNI (Italian Organisation for Standardisation) norms.

Kiian is developing new customised inks displaying other bio-plastic and bio-substrate characteristics and is also researching different printing technologies.

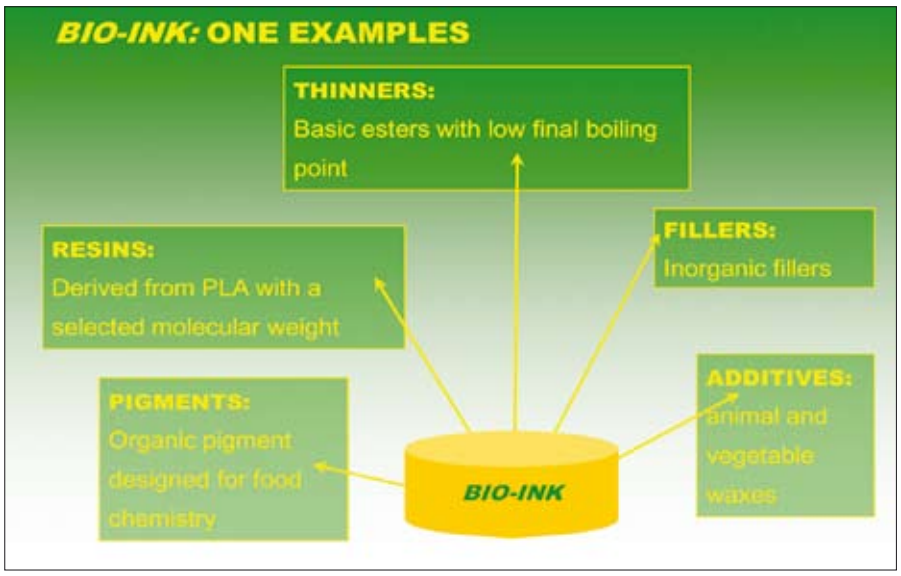

Figure 3

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UNCOVERING NEW PROFIT OPPORTUNITIES

Max Linder explains how delivering added value is the key to enhancing profits in the changing environment of graphic applications on self-adhesive vinyl

THE BUILDING INDUSTRY'S USE OF GLASS in constructing buildings such as airports and post offices is greatly increasing, and it is also increasing with regard to interior decoration in museums, offices and retail shops. The creative use of light shining through coloured or printed film creates stunning effects, and the use of film is more economical than using stained or specialised glass. Applying self-adhesive film also gives considerably more versatility. MACtac Glass Decor films can be used to improve a view or transform a car park into stunning water views; etch and frost films can create an aura of privacy and can be printed and then used as backlit graphics, taking advantage of their ability to play with natural light.

Print quality is fundamental for giving life and movement to the visual, for example by applying a progressively decreasing density visual. The most outstanding special effects can be created by printing delicate graphics onto clear or frosted film, inviting the sunshine in or using the graphics as backlit decoration.

To guarantee the best application results, the right product should be selected. If there are large printed areas in a graphic and the customer wants a 'see-through' effect, then the clarity of the film is important. High quality films with minimal shrinkage will require smaller overlaps for long-term applications; they will be less visible and create a more pleasing visual result.

GIVING LIFE TO WALLS

Brick walls are often a depressing part of a building, however they should be viewed as the parts that have yet to be utilised for either advertising or decoration. MACtac's IMAGin Wallrap 100 self-adhesive constructions offer a range of new opportunities which make it possible to apply digitally printed graphics directly onto brick walls so the once dark building frontages can now be lit up, promotions can be displayed on the outdoor walls of supermarkets, informative posters can be displayed or signs put up.

For such demanding applications, a high tack opaque adhesive and a highly conformable film (50 to 60 µm) will give excellent results – specifically great adhesion on clean brickwork, outstanding visibility of the digitally printed graphics and no edge lifting. Wrapping the street is also now possible thanks to the new MACtac Streetwrap films which are designed for direct application onto concrete and asphalt. Calendered PVC filmic constructions coated with a strong and clear adhesive are ideal for street graphics and are optimised for flat or slightly rough pedestrian traffic surfaces, such as concrete and asphalt.

Sign makers and event organisers can now ensure that safety and direction signs are more visible at a cost-effective price. However these constructions should not replace official road signs because their outdoor durability is limited to three months for pedestrian traffic when graphics are protected with recommended textured laminating films exceeding the ASTM D2047 norm for slip resistance.

TRANSFORMING SHOP WINDOWS

Shop windows and glass partitions are usually covered either with static images or unimaginative graphics, however new MACtac Glass Movie films allow rear projection to animate shop windows. These filmic constructions can be applied onto synthetic or natural glass and the movie-style pictures are projected from behind the glass surface, enabling them to be viewed by those passing by outside for added impact.

These constructions deliver greatly contrasting colours and a high image resolution, and rear projection on these films ensures that images are visible at both close range and from distance. Images are visible from a 100º angle and any screen size is possible, from a company logo to an XXL screen. Sign makers can give the screen the shape customers like as the film is easy to plotter cut. Rear projection films are as easy to apply as a standard self-adhesive film and are very cost-effective.

Glass movie technology can also be used to provide information or create a unique atmosphere for special events organised by travel agencies, car dealers, amusement parks, shopping malls and railway stations. Wherever image projection adds value, these films will deliver additional profit opportunities to printers. ■

New wall wrapping films can be applied directly onto brickwork for promotional or directional signs

Rear projection films are ideal media to create a unique atmosphere on shop windows and for special events

A progressively decreasing density visual creates an impression of movement

Max Linder is Director of MACtac

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A MIL CAN MEAN SO MUCH

Bryan Collings reports the many different meanings of a unit of measurement

WE HOLD OUR HANDS UP; we changed the article titled 'Membrane switch technology moves on', written by Michelle Adams of Norcote and published in the last issue of *Specialist Printing* (see page 40, issue 3 2009), from 'mil' to mm. We unreservedly apologise for this – it should have been mil with the meaning given in the definition shown below [1].

We thought our readers might be interested to read quite how many different uses the word mil in a measurement sense has around the world. The following is from a definition list by Russ Rowlett and the University of North Carolina at Chapel Hill (USA) which is at www.unc.edu/~rowlett/units/dictM.html:

miil or mijl alternate spellings for the Scandinavian mil [4] (see below).

mil [1] a unit of distance equal to 0.001 inch: a 'milli-inch', in other words. Mils are used, primarily in the USA, to express small distances and tolerances in engineering work. One mil is exactly 25.4 microns, just as one inch is exactly 25.4 millimetres. This unit is also called the thou. With the increasing use of metric units in the USA, many machinists now avoid the use of 'mil' because that term is also a handy slang for the millimetre.

mil [2] a unit of angle measure, used in the military for artillery settings. At one time the US Army used a mil equal to 1/1000 of a right angle, 0.1 grad, 0.09° or 5.4 arcminutes (often written 5.4 moa; see 'moa' below). Later this was changed to 1/1600 right angle, or 0.05625° (3.375 moa). In target shooting, the mil is often understood to mean 0.001 radian or 1 milliradian, which is about 0.0573° or 3.43775 moa. In the UK, the term angular mil generally refers to the milliradian. 1 milliradian corresponds to a target size of 10 millimetres at a range of 10 metres, or 3.6 inches at 100 yards.

mil [3] a common slang name for the millilitre (mL) or the millimetre (mm).

mil [4] in Scandinavia, the mil, pronounced like 'meal' in English, is a traditional distance unit considerably longer than Roman or English miles. In Denmark, the traditional mil was 24,000 Danish feet, which is 4.6805 miles or 7.5325 kilometres (this is the same as the north German meile; see above). The Danish mil has sometimes been interpreted as exactly 7.5 kilometres (4.6603 miles). In Sweden, the traditional mil was 36,000 Swedish feet, which is 6.641 miles or 10.687 kilometres. In Sweden and Norway the mil is now interpreted as a metric unit equal to exactly 10 kilometres (6.2137 miles).

mil [5] an alternate spelling of the mill [1] (see below).

mil-foot a mil-foot is a section of wire one foot long and one mil in diameter; this would be a unit of volume equal to about 0.0377 cubic inches or 0.6178 cubic centimetres. However the unit is used primarily in statements of resistivity in ohms per mil-foot or of density in pounds per mil-foot. The unit is also called the circular mil-foot. ■

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Figure 1: WP Digital's booth at a recent industry event

GLASS DECORATION USING UV INKS

In the first part of her article, Diana Dogaru describes how industrial printing and cleaning products can help with printing onto glass

GLASS IS A TERM THAT DEFINES a structural material that not long ago was used to fill a hole in our house to let the light in, with no specific aesthetic or energy-saving functionality. Today the new processes in glass manufacturing make its transparency an appealing quality for personalised decoration, offering possibilities for unique designs and finishes.

WP Digital started its associations with glass with the Virtu RS25 and RS35 industrial UV printing platform and with the development of a glass surface cleaning and pre-treatment solution to improve the mechanical adhesion of UV ink to glass. The solution was developed by the company, in partnership, as a portable, fully manual solution to help graphic customers expand their portfolio of UV decorated materials, passing through an intermediate phase as they grow of having the manual pre-treatment replaced by automatic devices and finally having an inline solution adapted for glass converters and glass manufacturers.

The advantage of the solution is that it gives the same extraordinary results for adhesion, surface tension, colour saturation and dot definition, from small batches in production to industrial quantities.

EXPANDING CAPACITY

The current economic climate is driving printing companies to look for new ways to sell their UV print capacity. There is an increasingly complex demand for specialised, value-added products that offer desirable and unique value, and for printing companies to differentiate themselves from the other hundreds of UV printing houses that exist today. Specialised architectural materials, as well as the more standard materials, are commonly printed with UV inks in the graphics market. MDF, glass, metal and ceramic are materials that offer solutions for indoor and outdoor decoration, walls of buildings, products in the bath / kitchen industry and white goods. All these interior and exterior elements are now viewed as being able to bear a potentially unique design message.

WP Digital has developed special glass surface pre-treatments in partnership; this was immediately followed by the added value the company gained with the graphics market: colour management for photography reproduction, accurate dot definition and resolution. WP Digital's testing laboratories are equipped with devices to study and quantify printing quality, optimise the ink jettability parameters to obtain predictable drops of a defined shape and volume, and simulators of different surface tension materials to foresee any possible effects when the ink interacts with the glass surface.

WP Digital has reached an advanced level of industrial application development, largely as a result of detailed market surveys, team dedication and perseverance. The company's aesthetic mission is to portray the intended emotions of a designer's concept beyond accurate print reproduction to offer a larger perspective on a UV-decorated product.

SCALABLE PROCESSES

With the robustness, accuracy and productivity of the Virtu RS25 and RS35 UV printing platforms, WP Digital sees great potential for improving the value proposition for glass decoration. The Virtu machine is sold as a stand-alone unit or can be integrated into an offline or inline solution, partnering with already existing cleaning and pre-treatment devices at the customer's site or in general industry.

Any new application usually starts in niche markets with small sampling production batches. WP Digital developed its cleaning and pre-treatment solution as a portable solution that can be used for small batches of glass decoration. The cleaning and pre-treatment solution has been developed to reliably decorate glass using UV inks, and addresses the following factors:

- The incompatibility between the glass, which is an inorganic material, and the organic UV inks; for this a bonding layer needs to be created to unify these two materials as the non-porous surface of the glass offers less mechanical anchor points for the UV ink to properly adhere to.
- The uneven surface tension of glass makes the ink adhesion variable when exposing the print under normal environmental conditions.

Various demands from different market segments requiring the scalable and modular solution made the WP Digital team realise that the development work they had done was a successful starting point for further development for industrial level machines, in partnership with glass processors or glass manufacturers.

Figure 2: Various interior decoration materials printed with UV inks

Figure 3: The portable glass cleaning and pre-treatment solution is designed for start-up business and small production batches

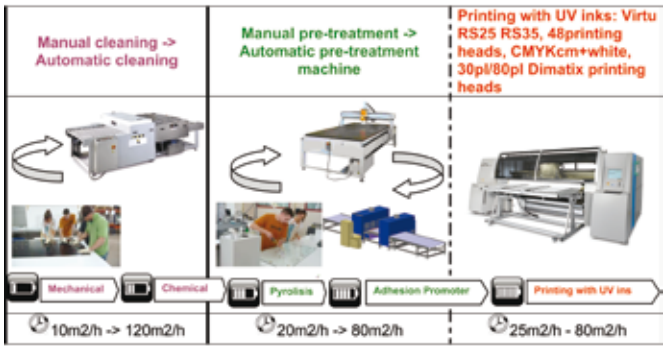

Figure 4: WP Digital's scalable solution for the cleaning and pre-treatment of glass for UV printing

GLASS CLEANING SOLUTIONS

One of the best solutions to glass cleaning problems is shown in figure 4. Cleaning is undertaken in two stages: mechanical and chemical. Mechanical cleaning eliminates the visual contamination of the glass surface and produces regular transparent surfaces. The heavy duty chemical cleaning agent is used to remove grease, oil and other residue that the glass becomes contaminated with during handling. The highly volatile chemical substance purifies the glass surface, preparing it for the pre-treatment phase.

The pre-treatment phase alters the microscopic layer of the glass, creating a roughness to provide mechanical anchor points for the adhesion promoter. The gas used is in a liquid phase in order to obtain very good wettability, together with a physical and chemical bond of the adhesion promoter to the glass surface. The adhesion promoter is applied in a fine layer immediately after flame coating; its purpose is to create an organic bridge between the inorganic glass layer and the organic ink. It also increases the stability of the ink layer. The process has no waiting time between the cleaning, pre-treatment and printing phases, and the glass is left with no stains following pre-treatment. ■

The concluding part of this article will appear in the next issue of Specialist Printing Worldwide; to subscribe go to www.specialistprinting.com or see page 15

Diana Dogaru is Business Development / Business Intelligence for WP Digital

Figure 5: Manual cleaning and pre-treatment at a customer's site

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All Nazdar inks are manufactured to the highest quality standards

AN EVOLUTION IN INK

Michael Fox describes the company history and product innovation that have led to the development of a key US ink supply business

NAZDAR MANUFACTURES A COMPREHENSIVE selection of UV, water- and solvent-based screen printing, flexographic and wide-format digital inks which are primarily used by printers in the point of purchase (POP), banner, container, industrial, metal, nameplate / membrane switch, roll label, sign and textile decorating markets. The company's range of digital printing inks can be used in a variety of digital inkjet printing presses.

COMPANY HISTORY

John Pottage Sr and Ed Owens founded Nazdar in 1922 in Chicago, USA, as Naz-Dar, focusing on developing new inks to meet the increasingly sophisticated demands of screen printers. The story goes that the two men were having a beer when they started talking about a process called screen printing and decided to form a company devoted to making screen printing inks. They noticed a coaster sitting on the bar with the word "nazdrovia", which is Bohemian for success – hence the decision to call their new company Naz-Dar.

The growth of the plastics industry in the 1950s and 60s led to the company's first extensive R&D programmes being established to keep pace with the rapidly increasing demand for higher performance screen printing products. In the 1960s and 70s Nazdar established its distribution network that now serves the Americas, Europe, Asia and Australia. Thrall Enterprises acquired Naz-Dar in 1977.

In 1982 Naz-Dar acquired KC Coatings and in 1993 it acquired the ink and supplies division of Advance Process Supply Company; the company subsequently became Nazdar and its headquarters was moved to Shawnee in Kansas, a US centre of UV screen ink development. Two years later Nazdar Digital was established to serve the needs of the large format digital printing industry. In 1997 Nazdar acquired Ink Dezyne, culminating in the launch of NDI Series digital inks in 2001.

In February 2006 Nazdar acquired the business and assets of Lyson and since the acquisition, the NDI and Lyson ink ranges have been integrated into a single product range under the Lyson brand. Nazdar now manufactures inkjet inks based upon all major inkjet chemistries: aqueous, solvent, low-odour solvent, oil-based, UV-curable, sublimation and speciality inks for textile printing and for coding and marking. Also in 2006 Nazdar entered the narrow web ink market, offering a range of UV and water-based technology including UV rotary screen, UV and water-based flexo inks (for paper and film) and multiple UV and water-based overprint varnishes.

THE CURRENT PROPOSITION

Until 1995 Nazdar was the screen printed billboard industry's major ink supplier, selling 1.6 million litres a year, but since then the company has had to evolve as grand-format digital printing has virtually replaced screen printing in this industry. Nazdar now has three divisions: Nazdar Inks and Coatings

Continued over

Award-winning screen printing and digital inks are produced at Nazdar's manufacturing plants in Shawnee, Kansas (USA) and Stockport (UK)

Nazdar manufactures a comprehensive selection of UV, water-based and solvent-based screen printing inks, flexographic inks and wide-format digital inks

manufactures ink, Nazdar SourceOne distributes inks, equipment and supplies to speciality graphics printers in North and Central America, and Nazdar Consulting Services provides training, software and consulting.

Nazdar has long been involved with the speciality graphics printing market, starting with sophisticated solvent-based screen inks then pioneering UV screen ink, and it is now a major digital inkjet inks manufacturer. Nazdar also makes products for other industries such as narrow-web / flexo, optical disc and digital coding / marking.

Nazdar develops products for the many other applications and technologies, apart from screen printing, that clients use to produce graphics for their end customer. For instance, the CATZper software programme eliminates the 'absolute zero' colour matching approach and replaces it with a defined tolerance based on visual acceptance. The CATZper Visual Test Grid replaces the need for look-up tables to match PMS colour, allowing the print device operator to quickly output a grid of hundreds of measured variations and match it visually and numerically after the first output.

Unsurprisingly with the present global economic downturn, Nazdar is currently experiencing its most challenging economic time ever; past economic down-turns were localised to various parts of the world whereas the recent down-turn was instantly felt around the world. However with the outlook that "No is just an expression of long-term interest", Nazdar is consequently continuing its expansion into new product markets and geographic segments.

SERVICE AND STAFF

The Thrall family are the owners of Nazdar; their maxim is 'family first', setting the example that staff must have a healthy balance of personal and professional time in order to be truly successful. There are several long-serving members of staff, including a mill operator, Jim Miller, who has been with the company for 40 years. Thrill Howard, a maintenance worker, has been with Nazdar for 36 years, having started at the company in 1973 and having this year celebrated his 75th birthday. Jim Davidson, the VP Global Operations, is another long-server at 28 years, having started at the company in 1981.

Over the years, Nazdar's marketing personnel have continued to identify and target products and markets that offer new opportunities for growth whilst the company has also strove to implement lean-business practices which eliminate waste and improve productivity and profits, while observing the old adage 'if it's not broken, don't fix it'.

Nazdar's mission is superior service for its customers and its objective is to go beyond just filling an order to provide solutions that help customers improve their products and processes. Fulfilling that mission requires a commitment to innovation that involves every area of its operations and corporate behaviour, so the company invests in its strengths: its employees, quality, distribution, R&D and business partnerships. Nazdar's quality management system received ISO certification in 2006, further demonstrating a commitment to superior products and services.

PRODUCTS AND BUSINESS STRATEGIES

The most significant product developments over the course of the company's history include the Nazdar / KC Coatings UV screen ink product which the company states was the first such commercially viable product. Nazdar also played a large part in the use of halftone printing in the screen printing market by quickly adapting the litho process printing concept to screen ink, offering an extensive process colour ink range.

While remaining focused on its core screen printing ink business, Nazdar sees good opportunities in the industrial screen and textile markets; the company is continuing to grow in the digital inkjet and narrow-web / flexo markets. The company is pursuing a strategy change from originally producing only screen printing inks to now offering inks and coating products and technology to meet various needs such as grand-format digital inkjet inks, marking and coding digital ink, and a full line of narrow-web / flexo inks.

Nazdar Consulting Services offers consulting and training from industry experts

Nazdar accepts its responsibility as a corporate citizen and acknowledges its obligation to help improve the quality of the environment, society and community that it is a part of, and with this in mind it is committed to formulating all of its products with environmental advantages in mind, including more energy-efficient UV curing inks that are V-Pyrol free, and heavy metal-free solvent-based inks designed to have lower VOCs and easy reclamation. Nazdar also provides regulatory compliance training to industry associations and printers.

Nazdar is very excited about the opportunities for growth in products for the screen, digital inkjet and narrow-web printing markets, as well as its potential vast worldwide geographic expansion. The industrial and functional printing markets are particular areas of growth and opportunity for the company. Nazdar primarily does business in the USA and is working hard to expand into other markets, pursuing a 33% customer base split between the Americas, Asia-Europe and Africa.

THE SPECIALIST PRINTING INDUSTRY

The specialist printing industry has changed significantly since the company began – the rate of graphic print technology change has been enormous. Management at Nazdar believe that digital inkjet printing will continue its rapid growth rate, especially in the flatbed area, which will also impact the industrial printing industry.

Nazdar concludes that manufacturers and suppliers should be concentrating their strategies on bringing the best value to speciality printers, helping them demonstrate the features and benefits of the print applications they use for products to the advertising agencies and end customers, in order to provide printers with the best print options to make them profitable.

As a final note on the global outlook for the speciality printing industry, Nazdar believes that the graphic Point-Of-Purchase market has seen a rapid decline in these times of recession, but that we are in the bottom of the 'U' and the rebound will occur in the second half of this year. ■

Michael Fox is President of Nazdar

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GLASSPRINT 2009

25–26 November 2009; Frankfurt, Germany

GLASSPRINT 2009, EUROPE'S LEADING EVENT for the decoration of glass, will take place in Darmstadt, near Frankfurt (Germany) in November. Decoration is a key process in the manufacture of architectural, automotive and hollow glass, and adds considerably more value to the end product. GlassPrint 2009 is a two-day conference that will recognise the importance of this expanding and developing sector and will present attendees with the latest trends and developments for the decoration of all types of glass.

GlassPrint 2009 will expand upon the highly successful 2005 and 2007 events and moves to the spacious and easily accessible Maritim Konferenz hotel in Darmstadt. GlassPrint 2007 attracted an international audience of 170 professionals from over 20 different countries; feedback from attendees indicated that:

- *96% of delegates and 100% of exhibitors thought the standard of the conference programme was good*
- *96% of delegates said the content of the presentations would be useful to their business.*

In the current economic climate, expert speakers will recognise the importance of adding more value to the end product. English-language presentations will cover:

- keynote addresses
- new innovations in heavy metal-free inks
- innovation in digital printing
- advanced machinery technology
- efficient pre-press technology
- group discussions.

REGISTRATION

Space is limited at GlassPrint 2009 and delegates from Australia, Austria, China, Croatia, France, Germany, India, Israel, Macedonia, Russia, Sri Lanka, Sweden, Switzerland, Turkey, UK and USA have already confirmed their attendance. Delegates can still register for €495 (approximately $700 / £420) by visiting the website (www.glassprint.org) or emailing sales@glassworldwide.co.uk; registration includes lunch, dinner, refreshments and access to the conference and exhibition areas.

LOCATION

The Maritim Konferenzhotel is conveniently located under 30 minutes from Frankfurt Airport, and is only a few minutes from the major European motorways and important public transport connections. A shuttle bus, which costs €7, operates every 50 minutes from the airport to the hotel, or a short taxi ride is approximately €40. Substantially reduced room rates are available for GlassPrint delegates and a booking form will be supplied upon registration.

Frankfurt International Airport is the largest airport in Germany and the third largest in Europe, providing easy access from around the world. Situated on the Main River, Frankfurt is a multi-cultural city and is one of the two largest financial centres in continental Europe.

Darmstadt is home to many high-class research and development institutions that attract people from all over the world. The city also offers diverse cultural activities and is located in the charming environment and beautiful landscapes of the Odenwald mountain region, the wine-growing area along the Bergstraße mountain road, and close to the Rhine, Main and Neckar rivers.

CONFERENCE SCHEDULE

At the time of going to press, the conference schedule is as follows (subject to change):

DAY ONE (7 PRESENTATIONS)
10.00-12.40 Registration and tabletop exhibition
12.40-12.45 Greeting & introduction
12.45-13.30 Flat glass keynote presentation: Mike Young – Top 5 secrets of screen printing architectural glass
13.30-14.00 The whole package of decoration options available and their compatible nature (Ferro)
14.00-14.30 Print testing, performance and quality control (RUCO + Customer)
14.30-15.00 Coffee break & tabletop exhibition
15.00-15.30 The very latest in large format Computer-to-Screen (CtS) technology for automotive and architectural flat glass printing applications (SignTronic)
15.30-16.00 UV curing in glass decoration (Fusion UV)
16.00-16.30 Coffee break & tabletop exhibition
16.30-17.00 Benefits of using servo-technology for screenprinting hollowware (ISIMAT)
17.00-17.30 Organic inks for flat glass applications – today and tomorrow (Marabu)
17.30-19.00 Tabletop exhibition
20.00 Evening meal (included in delegate fee)

DAY TWO (7 PRESENTATIONS)
08.30-09.30 Tabletop exhibition
09.30-10.00 Container glass keynote presentation: TBA
10.00-10.30 Step-by-step guide to adding value to glass by digital printing (WP Digital)
10.30-11.00 Flexibility in screen and cost saving in stencil preparation (Grünig)
11.00-11.30 Coffee break & tabletop exhibition
11.30-12.00 New techniques for large format glass decoration (Sefar)
12.00-12.30 The benefits of Computer-to-Screen (CtS) technology for hollowware printing (KIWO)
12.30-13.30 Lunch (included in delegate fee) and tabletop exhibition
13.30-14.00 Digital printing on glass with sol-gel inks (Munich University / Ormoprint)
14.00-14.30 Addressing environmental concerns through the use of organic inks (PPG)
14.30-14.40 Farewell and thanks
14.40-16.00 Tabletop exhibition
16.00 Event closes.

In addition to the technical papers, Mike Young's flat glass keynote presentation will navigate key issues that have the most dramatic impact on performance of any flat glass screen printing operation. A similarly impressive keynote speech for the container glass industry will be announced very soon – visit the website for the latest updates. ■

ORGANISERS AND SPONSORS

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

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

Chamleleon Business Media Ltd
Chamleleon Business Media is publisher of *Glass Worldwide* and *Specialist Printing Worldwide*, a technology-driven international publication covering wide format digital and screen printing throughout the graphic, industrial and textile sectors.
www.cbm-ltd.com

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GLASSPrint2009 CONFERENCE

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FESPA INDIA 2009

7–9 December 2009; Delhi, India

AFTER THE SUCCESS OF FESPA WORLD Expo 2005, FESPA World Expo 2007 and FESPA Digital India 2009, the organisers are staging FESPA India 2009 to display the latest techniques and innovations in the global print industry and provide a platform for around 10,000 professionals and 200 leading brands.

This year's FESPA India will be held in halls 9, 10 and 11 of Pragati Maidan in New Delhi; the show organisers, FESPA and Services International, say that Delhi was chosen by the exhibitors as the most popular venue for the print industry.

VISITORS AND EXHIBITS

Attendees are expected to comprise printing professionals who are interested in digital wide-format printing, including those who own or run a large print facility and need new ideas, products and techniques to improve profitability, or those who are looking to invest in digital for the first time. Visitors are expected to include graphics providers, art / creative directors, brand managers, graphic designers, marketing professionals, photographers, print management professionals and sign makers.

FESPA India will offer the opportunity for visitors to see the latest technology in the wide-format digital imaging sector, and will include displays of the following products:

- screen printing equipment
- UV flatbed printers
- wide and super wide format printers
- inks and substrates
- colour management products and systems
- CNC routers
- laser engraving machines
- vinyl products
- laminating equipment and consumables
- prepress systems, presentation and display equipment
- proofing equipment
- mounting machines
- electric and LCD signage
- sign making
- textile printing machines and equipment
- knitting machines. ■

Further information:
web: www.fespaindia.com

INK SUPPLIER CELEBRATES 150 YEARS

MARABU, LOCATED IN TAMM NEAR LUDWIGSBURG, Germany, develops, produces and sells inks for screen, pad and digital printing for graphic and industrial applications as well as a broad range of paints for creative use. In July this year the company held an event at its headquarters to celebrate its 150 year jubilee.

HISTORICAL DEVELOPMENT

Marabu was founded in 1859 in Stuttgart, starting out as the 'Colours and Materials' art retail business before changing its name to Marabu in 1909 and concentrating on inks, and subsequently relocating to Tamm, north of Stuttgart, in 1919. In 1921 Marabu started exporting to Italy, Finland, Romania and Hungary, and two years later the Marabuwerke (factory) was founded.

The Pantachrom oil paint was initially developed in 1928 for painting onto glass, but was subsequently used for Marabu's first screen printing experiments. The company's first screen printing ink, Marapid A, was released in 1952. Ten years later the Siebdruckring, a network which connected Marabu with 30 German distribution partners, was founded to pool a broad range of expertise and led to the development of screen printing inks, accessories and machinery. The Siebdruckring was the forerunner of today's Siebdruckpartner, which celebrates its own 20 years of existence this year.

As the first German manufacturer of screen printing inks, Marabu developed its own colour reference system in the 1970s; a base of 14 standard shades enabled a total of 76 further mixed colour shades. The following decade Marabu System 21 was enlarged to 168 colour shades, becoming an ideal colour reference tool for screen printers.

During the 1970s Marabu introduced printing inks for the new technique of pad printing, for decorating curved and three-dimensional substrates. In 1987 the company simultaneously started the production of UV-curable and water-based screen printing inks, and in 1995 it started developing solvent-based digital printing inks for Piezo print heads. Using the knowledge from solvent-based and UV-curable screen printing inks, a range of digital printing inks were developed and launched in 2002. In 2004 its Creative Colours Division moved to a new purpose-built factory in nearby Bietigheim-Bissingen. A year later Marabu introduced its first UV-curable pad printing ink.

CELEBRATING 150 YEARS

The current Marabu product range of solvent-based and UV-curable printing inks is designed for industrial and graphical applications. Today the company has approximately 400 employees worldwide with 12 subsidiaries, and distribution partners in more than 80 countries. Average company turnover has grown to €74 million a year, with 70% of output being exported. Shareholder and Managing Director Rolf Simon heads the Central Division, whilst Dr Roland Stählin is responsible for the Printing Inks Division and Uwe Braun heads the Creative Colours Division.

At the 150th anniversary celebration the current owners reflected on the continuing success of their brand. "During 150 years of successful company history, Marabu has constantly managed to answer the variable challenges of the market with effective concepts," said Rolf Simon. "Creating satisfied customers, while recognising new trends, is the key to success."

"Within the Printing Inks Division we continuously focus on internationalisation. By implementing the right strategy, we were able to launch and position suitable products for important applications," Roland Stählin commented when asked about recent product developments. "Innovative ideas like 'Marabu Living' for interior design inspire our customers," added Uwe Braun.

When asked about hopes for the future of Marabu, Rolf Simon responded: "To always have an accurate sense for what our customers' future demand will be. Close co-operation with our distribution partners and proximity to potential customers and users, therefore, remains our most important issue." ■

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to come by

16th october

EXPANDING THE NETWORK AND DEVELOPING EXTERNAL KNOWLEDGE


Peter Buttiens

ESMA KEEPS ON BUILDING ITS NETWORK in the process printing industry. With the growing potential of printed electronics (PE), it was logical to build a close relationship with the Plastic Electronics Foundation and Intertech Pira. ESMA can announce a number of benefits for its members at the next conference, Plastic Electronics Europe 2009, which takes place from 27-29 October in Dresden, Germany.

ESMA has also developed co-operation with IdTechEx in Europe to provide benefits for its members. IdTechEx is known from its conferences all over the world but is mostly known for its Printed Electronics and Photovoltaics conference in Dresden.

We also can announce that ESMA has started a close co-operation in supporting the viscom Germany exhibition, again with certain benefits for the Association and its members. Our goals are to have a closer involvement with the exhibition and create more potential value. The contract covers mutual assistance in advertising and marketing and includes regular professional exchanges to develop the European market.

For ESMA members, viscom 2009 offers a premium-plus package which includes use of an ESMA lounge for the first time. With the growing numbers of digital members in the Association, a close co-operation can only be a benefit to members and to the viscom exhibition.

Developing new products and investing in R&D costs our members increasing amounts of money in order to be competitive. ESMA has developed a number of opportunities to give a helping hand globally in this area. Involvement in several projects in Europe has given additional information and insight that can help members to understand more about certain developments without spending large amounts of money.

The largest current project is CLIP (Conductive Low-cost Ink Project), which is funded by the European Committee through an FP7 project. The development of new nano-based inks with less silver will open larger opportunities for RFID, antennas, smart packaging, PV and many other developments in the future to become more competitive in the production environment. This project is with a consortium of 15 European companies and research institutes.

Another project is Sensortex, which has funding from IWT and looks at the further development of sensor-based inks with better graphical results. These are biochrome, thermochrome or photochromic-based inks and the developments are for digital or screen-based inks.

The last project concerns colour management and standardisation for screen inks. The project analyses how to create a stable screen print environment to improve quality and maintain this quality over longer runs; this gives new potential to screen printing by creating optimisation of the printing process in general. The feedback has been used for other projects and committees within ESMA.

The expansion of the network of co-operation and finding opportunities with external projects will always have support from committees, conferences and provide other opportunities for ESMA members. ■

Peter Buttiens, CEO of ESMA

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NASMA FALL MEETING


Parnell Thill, Chairman of NASMA

THE FALL MEETING OF NASMA IS scheduled for 27th and 28th October in Cincinnati, Ohio. Our host will be ST Media, publisher of *Screen Printing Magazine*. The agenda for the Fall Meeting will include a review of the organisational changes voted into effect on a trial basis last May. Also on the agenda are several initiatives slated for review and initiation, including the market metrics survey and the business barometer.

As always, members will share their individual concerns and experiences relative to their respective businesses with a collective eye toward profiling a composite 'state of affairs' for manufacturers serving specialist printing markets. Particular items of anticipated concern are: the economic outlook and potentially mitigating factors, the ongoing Green Initiative and ways in which NASMA members can co-operate with its ESMA brethren, SGIA and other industry organisations. ■

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