ISSUE 1
2013
GLOBAL TECHNOLOGY IN FOCUS
DIGITAL SCREEN AND PAD PRINTING

SPECIALIST printing worldwide

Sponsored by

CSGIA

CSPIA
CHINA SCREEN PRINTING INDUSTRY ASSOCIATION
中国丝网印刷行业协会
China Screen Printing Industry Association

ESMA
Driving Print Excellence

NASMA

SGIA

See page 23

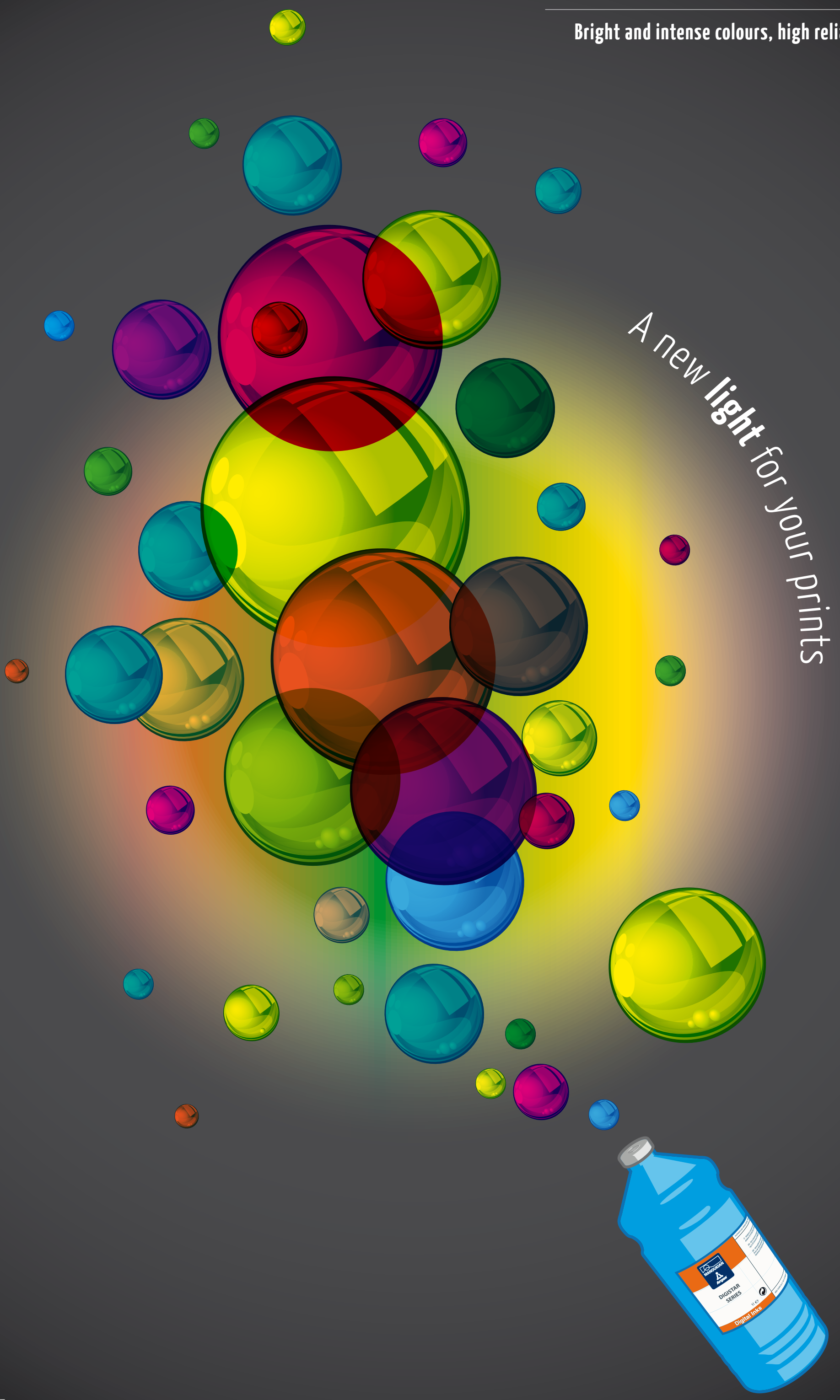
MANOUKIAN
Argon

NEW

DIGISTAR BILLBOARD

Digital ink with water-based pigments
For graphic applications from retail market to fine art

Bright and intense colours, high reliability, satin finishing



KIIAN Group

Kiian S.p.A.
Via Alcide De Gasperi 1 / 22070 Luisago / Como / Italy
ph +39 031 9090111 fax +39 031 920505
info@kiian.it / **www.kiian.com**

Discover Kiian world through this **QR code**

Welcome

Benvenuti
Bienvenue
Willkommen
Bienvenido
欢迎您
Добро пожаловать

34

44

MESSAGE FROM BRYAN COLLINGS

With the festive season behind us and the 'Fiscal Cliff' swerved for a few months, we're all looking into our crystal balls to see what we can expect for the rest of 2013.

The general consensus seems to be that markets will start to make a slow recovery, with China looking better than it did six months ago and the EU Central bank taking the heat off the sovereign debt of the weaker members.

There are still plenty of snakes in the long grass waiting to slip out and cause mayhem in the markets but at least some of the fundamentals needed for recovery are evident. The biggest fear for most of us is that governments start to allow inflation to rise to erase some of their debt burden, which in turn will mean that we have to get more from our customers as our cost base goes up; and we all know how difficult that will be. However, managed well it can be an opportunity to increase margins.

The broad range of technology-focused content in this issue is aimed at assisting all users of screen and wide format digital systems during these challenging times. We continue to be delighted to hear from our ever-growing global readership that our content provides them with practical solutions to the everyday issues they face.

But I've recently heard from a few disappointed readers who didn't receive the last issue. Just to remind you, the **ONLY** way to receive all issues is to subscribe for a total of only €55 / $80 / £45 per year. To coincide with FESPA 2013, our next issue will be a bumper one that you certainly won't want to miss! Please subscribe now at www.specialistprinting.com to avoid disappointment.

Finally, see page 53 for the latest details on ESMA's Advanced Functional & Industrial Printing 2013 conference on 6-7 March in Düsseldorf. Limited delegate spaces are still available!

We wish you good trading in 2013.

Bryan Collings, Publishing Director,
Specialist Printing Worldwide

THE CHANGING SHAPE OF INDUSTRY EXHIBITIONS

Sophie Matthews-Paul considers the future for trade events

It's not so long ago that, when a trade exhibition announced its dates, then participants and visitors alike were quick to queue to be there, for these were the shows where new technologies and innovations were trumpeted. Today, however, we are seeing an intrinsic shift in emphasis on the style of industry events, and an increase in specialist opportunities shaping our agendas. For many, these are more pertinent to immediate business activities and future plans than a mega extravaganza which tries to cater for all.

The exhibition calendar has always been party to variable audiences, and these trends surely are driven by the shape of the industry and the direction in which it is going. Perhaps the move to digital processes has played a part in streamlining what people really want from a trade occasion; it is no longer easy to provide a catch-all that will attract everyone. Likewise, we probably can blame the continuing tough economy, in part, for the potential fall-off in attendance at major industry events. These days, it simply isn't so easy to shut up shop for a few days and head off to a venue to see what's new and to do a bit of networking.

From an exhibitor's point-of-view, taking part in a show of any size is going to cost money and time; nowadays everything needs to be quantified and justified and accounted for. So, taking Ipex as a topical example, we have seen several key companies make the decision not to attend 2014 at London's ExCel. There must be myriad reasons for not confirming a booking, particularly when you consider it's not so long ago that the likes of HP, Heidelberg and Xerox all used to occupy entire halls at the NEC, but surely a key reason must be the way in which the industry has diversified. This is complemented by the manner in which relationships are driven between manufacturer, supply channel and customer and, if the decision is made that better results can be achieved by attending niche shows and holding specialist events, then that must be an indication of what people need, particularly in the leaner, and perhaps meaner, 21st century.

INDEPENDENT PLATFORMS

In the world of specialist printing, the desire for information continues to grow and, with it, the necessity for the types of occasion which cater for specific areas that often fall away from mainstream processes. Giving manufacturers and suppliers a more independent platform is becoming essential, and it is testimony to the increase in interest in these events that we are seeing an upsurge in popularity for staging shows that concentrate on niche segments. We now expect independent platforms that cover glass, the environment, industrial printing, textiles, packaging and other sectors, backed up by conferences and round tables. Yet we also see exhibitions like Fespa continuing to ride the digital wave as a complement to its screen-printing origins, and not falling into the trap of trying to be all things to all men.

At the time of writing this, I'm at EFI's Connect 2013 in Las Vegas, and this is a classic example of why customer-focused occasions work so well. This is the 14th of these showcases and this year's was more heavily subscribed than ever before. Of course, that the reason for this is the move away by print service providers from mainstream exhibitions to more focused events is a matter for conjecture; but surely this growth in popularity must partly be down to users wanting to focus more on specifics rather than ploughing the aisles of vast exhibition halls just in case they find something that's relevant to their business models.

Guy Gecht (left) talks to Benny Landa at EFI Connect

CHANGING PRODUCTION CAPABILITIES

Back in the eighties our industry was awash with exhibitions, peppered with established events that we thought would be here forever. Yet several have now vanished without trace and, three decades later, only the strongest have survived. But, just as our production capabilities have changed to embrace lower volumes and specialist applications, the diversification in processes now needs greater clarification and a clearer focus within the markets being served.

At Connect there was a fascinating 'fireside chat' with EFI CEO Guy Gecht and Benny Landa, and one of the topics was exhibitions. Landa, who's confirmed he's not planning to exhibit his Nanography anywhere in the foreseeable future, summed it up by saying: "You know all your customers; today's communications are different, and the way clients and vendors interact is different." So the future of trade shows, too, will be different and it will be interesting to see how they will change to retain their position in the industry's calendars.

Sophie Matthews-Paul is an independent analyst and editorial consultant to Specialist Printing Worldwide

Specialist Printing Worldwide (ISSN 2044-2319)
is published by: Chameleon Business Media Ltd,
1 Cantelupe Mews, Cantelupe Road
East Grinstead, West Sussex RH19 3BG, UK
Fax: +44 (0)1342 322664 www.specialistprinting.com

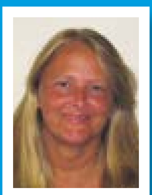
PUBLISHING DIRECTOR:
Bryan Collings
bryancollings@specialistprinting.com

EDITORIAL CONSULTANT:
Sophie Matthews-Paul
Tel +44 (0)1544 340057
sophie@specialistprinting.com

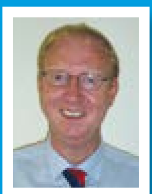
DESIGNER:
Alison Smith for
Blue Daze Design Ltd
copy@specialistprinting.com

SALES MANAGER:
Carol Gibbons
Tel: +44 (0)1425 617429
carolgibbons@specialistprinting.com

PUBLISHER:
Frazer Campbell
Tel: +44 (0)1342 322278
frazercampbell@specialistprinting.com



PUBLISHER:
Debbie Drewery
Tel: +44 (0)1342 322392
debbiedrewery@specialistprinting.com



PUBLISHER:
Dave Fordham
Tel: +44 (0)1342 315032
davefordham@specialistprinting.com

ADMINISTRATION/ SUBSCRIPTIONS MANAGER:
Sam Dunmore
Tel: +44 (0)1342 322133
samdunmore@specialistprinting.com

GERMAN AGENT:
August-Wilhelm Rust
Internationale Medienvertretungen
Tel: +49 6127 660325
Fax: +49 6127 965 9734
info@specialistprinting.com

Prime Seal ink adhesion promoter launched by Drytac

Drytac has introduced Prime Seal, a new low viscous liquid that enables printing and coating of hard-to-stick surfaces. Applied by hand or with a roll coater, Prime Seal promotes the adhesion of inks and enhances the colour density and clarity of the colors printed.

"With the addition of Prime Seal, we have greatly enhanced our line of UV-curable liquid coatings," said Marc Oosterhuis, Drytac President. "Glass, tile, and steel can often cause problems during the printing process, but Prime Seal allows inks to bond easily with these substrates – improving the overall quality and appearance of the final printed piece."

Prime Seal is ideal for traditional screen-printing ink systems as well as digital UV-curable ink systems. Although it is not a top coat, it can be used to stabilise inks after they are printed, and it also allows for a UV coating to be applied without transferring inks back to the image.

As always, Drytac recommends that customers test Prime Seal prior to use to ensure it will work with their environment and substrates. ■

Smart-X now available in 19mm thickness

Smart-X from 3A Composites is available in 19mm thickness for the standard formats of 1,220 x 2,440mm and 1,220 x 3,050mm. This means the all-plastic sheet material, which has a core of expanded polystyrene and surfaces of impact-resistant solid polystyrene (HIPS), is now available in three different thicknesses.

The light weight, high rigidity and flatness of Smart-X for all thicknesses means it is ideal for all types of signage, especially wide-format or long applications. It is also an optimal medium for self-supporting, free-standing structures such as point-of-sale applications. Due to its excellent resistance to weathering, with high UV stability and humidity resistance, it is an excellent substrate for external applications for up to two years, important in the field of event marketing.

Additionally, Smart-X is a mono-material composite panel made from 100% polystyrene, meeting the demand for ecological materials in the area of visual communication. ■

The addition of 19mm means Smart-X now comes in three thicknesses

SPONSORED BY:

ESMA Driving Print Excellence
www.esma.com

NASMA

CSGIA
www.csgia.org

CSPIA
www.cspia.org

SGIA
www.sgia.org

CONTENT PARTNERSHIP:
OUTPUT
www.outputmagazine.com

SUBSCRIPTIONS: The only way to receive the next 4 issues (covering 12 months) is to have an annual subscription for €55, $80 or £45. Please contact subs@specialistprinting.com or subscribe online at www.specialistprinting.com

Chameleon Business Media Ltd
Changing to meet your industry's needs

Royal Mail Periodicals Code for Presstream Y4778

Hydrocolor Ink Technology

Outdoor Durable, Water Based Inks

NAZDAR® Ink Technologies

Environmentally Friendly Digital Inks With Multiple Applications!

- Extensive digital media & industrial substrate range
- Suitable for most piezo print head technologies
- VOC free
- Extra wide color gamut
- 2 year outdoor durability
- Reduced ink usage compared to Solvent & UV
- Non-Hazardous & Non–Flammable
- Ideal for system integrators & printer manufacturers
- Available in:
  C, M, Y, K, LC, LM & W

Hydrocolor Ink Technology

Nazdar – An Ink That's Right For Every Job.

Nazdar works with inkjet partners around the world to develop integrated systems for new application opportunities. With minor hardware and software adaptations to standard solvent and water based printers, system integrators can create unique printing systems with the full backing and support of a world renowned ink manufacturer.

For more information:
Email: Hydrocolor@nazdar.com
or call Nazdar Ltd.
Tel: + (44) 0.161.442.2111

Nazdar Ltd.
Barton Road
Heaton Mersey
Stockport, England SK4 3EG
Tel: + (44) 0.161.442.2111

Nazdar Worldwide Headquarters
8501 Hedge Lane Terrace
Shawnee, KS 66227-3290 USA
Tel: (913) 422-1888
Email: custserv@nazdar.com

Nazdar Asia
10, Changi South Street 3
#04-04
Singapore 486147
Email: aspac@nazdar.com

Nazdar International Sales
& Distribution
Ph: (913) 422-2255
Fax: (913) 422-2296
intlexp@nazdar.com

Ilford announces European availability of ink-jet back-lit display media

Ilford has announced the availability in Europe of its Omnijet Display Trans Media Kit which doesn't require wet chemical processing. It offers a photo-quality, cost-effective alternative to traditional back-lit silver halide displays and has been developed in association with Epson and optimised for the Epson Ultrachrome K3 and HDR ink sets, and all relevant printers using them.

Omnijet includes display film, laminates and dedicated RIP profiles and is competitively priced against traditional silver halide products. It produces photo-quality backlit displays without the need for wet chemical processing and has been optimised for the popular Epson Stylus Pro 11880.

Sign and display producers who formerly created traditional silver halide back-lit displays can benefit from the reduced physical footprint of ink-jet printing as well as increased workflow efficiency achieved through printing back-lits with their regular wide-format aqueous-based printers. The Omnijet Display Trans Media Kit produces impeccable image quality even in dense black areas and skin tones and is adapted for use in the latest generation of back-lit display devices.

The media kit consists of photo-quality translucent display film and two rolls of laminates for front and back hot lamination. The rolls are available in 127cm and 152cm widths to match traditional silver halide dimensions and come in 40m lengths for optimum productivity. In addition, two levels of profiles have been developed for Caldera and Onyx RIPs to offer either maximum quality or maximum productivity depending on the final nature of the output. ■

Sarah Fenna brings wide-format expertise to new role at Signmaster Systems

Sarah Fenna has joined Signmaster Systems

As part of its strategy to increase its coverage of the digital market, Signmaster Systems has announced that Sarah Fenna has joined the company in the newly created role of sales and operations director. She makes the move from Robert Horne Group and will be responsible for developing new markets and strengthening the Shropshire-based specialist's position as a leading supplier of sign-making and display solutions throughout the UK and further afield.

Fenna's long history in the materials and consumables markets is complemented by her extensive technical knowledge of wide-format digital printing machines and all ink technologies. Her appointment at Signmaster coincides with the company's growth in all areas of the ink-jet arena, expanding on its families of solutions from Mimaki and Roland to service a steadily growing customer base of sign-makers, display producers and specialist print service providers.

More than 20 years experience in sales within the print and paper industries has resulted in Fenna achieving an extremely broad knowledge of the wide-format arena, including software and consumables as well as machines and technologies. Her consultative approach gives her the ability to generate new business and overall growth for Signmaster Systems, and her appetite for inspiring new initiatives will benefit the company as it moves to the next level of meeting the future digital requirements for its customers.

"We wish Sarah every success in her new position at Signmaster," comments John de la Roche, national sales manager at Hybrid Services, exclusive UK and Ireland distributor for Mimaki. "Her comprehensive knowledge of the Mimaki portfolio complements her overall experience and we're sure she will be an asset to Signmaster and its customers."

Signmaster Systems was founded 16 years ago and has grown from being a supplier of sign-making equipment to one of the UK's leading providers of digital solutions to display producers and commercial printers investing in the ink-jet arena. Priding itself on service, the company's customer base includes high numbers of repeat clients as well as first-time users who need good value for money and reliability.

"The wide-format display arena is becoming increasingly diverse and the time is perfect for Sarah to be joining us in a new sales and operations role. This is a challenging position and one which will be welcomed by all of our suppliers and customers," states Phil George, joint managing director and technical engineer at Signmaster Systems. "Her extensive knowledge of all the technologies associated with the digital market and her long-term experience in a large organisation mean that she will bring invaluable expertise to our company and play a major role in its continued growth."

"Joining Signmaster Systems gives me the valuable opportunity of adapting and streamlining the expertise I have developed during the past two decades to a family run business," adds Fenna. "I'm looking forward to the challenge of helping to shape the company's ongoing success and continuing to develop its growth in the ink-jet sector." ■

EFI new Fiery production workflow products accelerate print provider growth

EFI has introduced its Fiery Workflow Suite, a comprehensive set of integrated products to accelerate business growth and profitability. As part of its broad portfolio of integrated products, the suite delivers a unique, fully integrated workflow from job submission and business management to scheduling, preparation, and production for a new level of productivity.

Fiery Workflow Suite products are designed to integrate seamlessly with EFI's Fiery digital front end. The suite includes applications for job submission, pre-press, make-ready, colour profiling and management, personalisation, and output management.

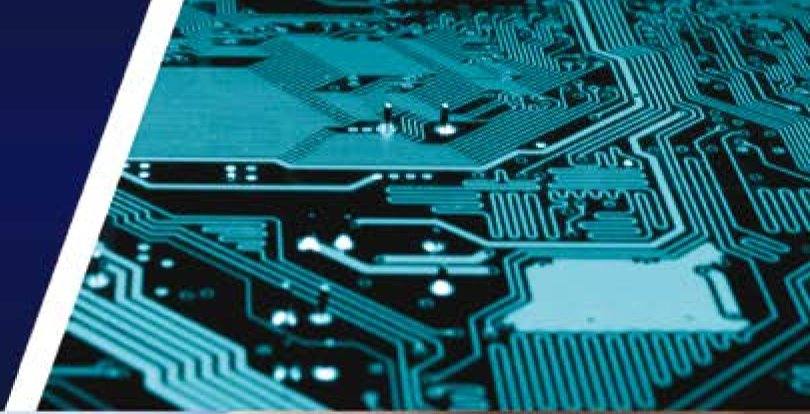
"Print service providers are increasingly replacing standalone workflow solutions with integrated, customisable solutions," says Kaspar Roos, associate director for the InfoTrends production workflow and customised communication service. "In our 2012 Digital Front-End Study, we found strong evidence that print providers want to move their workflow solutions to the DFE so that they can run their workflow from a central location that easily integrates with other systems. With EFI Fiery Workflow Suite, based on its popular Fiery platform, EFI offers its customers exactly this."

"Fiery Workflow Suite products also integrate with EFI's web-to-print and print MIS systems, giving our customers an advanced set of end-to-end products to reach greater levels of automation and profit," comments Toby Weiss, senior vice president and general manager of EFI's Fiery business unit. "Print service providers can quickly adapt to changing market demands by adding the modular Fiery Workflow Suite products and dramatically grow their bottom line by offering personalisation, quick turn-round on complex documents, and the ability to keep jobs that demand precise colour quality in house."

Fiery Workflow Suite includes three key new applications. These are Fiery JobFlow, Fiery JobMaster, and Fiery Central, which work together to increase print production efficiency with integrated and automated workflows, maximise print engine capacity and capability, process more jobs in less time, and help print service providers offer new higher-profit, value-added services. ■

ALPHA™

MICRO-LINE SCREEN PRINT PRODUCTS



FIRST IS BEST.

The IKONICS® Corporation, through its Chromaline® Screen Print Products division, is proud to announce the introduction of **ALPHA**™ micro-line screen print products.

ALPHA E-20, dual cure emulsion, is engineered specifically to meet the demands of extremely fine-line resolution and durability needed in industrial applications such as the printed circuit board, flat panel display and other electronics printing industries. ALPHA simply has no competitive peers.

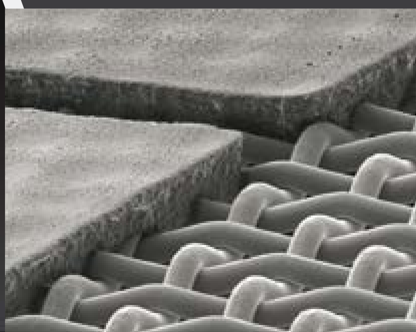
With the capacity to achieve 20 micron line resolution and the world's finest edge definition, super-durable, ALPHA E-20 allows highly technical, industrial printers to accomplish what has, until now, been impractical. Compare ALPHA E-20, side-by-side, with any seemingly competitive product.

ALPHA. First is Best.

CHROMALINE.COM/ALPHA

Alpha™ E-20 emulsion at 200 x Magnification on 500 calendared stainless steel mesh of 20 micron lines and spaces. Microphotography supplied by Chromaline Labs™.

Alpha™ E-20 emulsion at 400 x Magnification on 400 stainless steel mesh. Microphotography supplied by Chromaline Labs™.



chromaline® SCREEN PRINT PRODUCTS

Chromaline Screen Print Products
4832 Grand Ave. Duluth, Minnesota 55807 **Tel:** 218-628-2217 / 800-328-4261
Web Site: www.chromaline.com **E-mail:** sales@chromaline.com

AN **IKONICS** COMPANY **ISO 9001** CERTIFIED **ITAR** Compliant NASDAQ LISTED: **IKNX**

Caldera aims to set the standard with version 9.10 release

Wide-format software specialist Caldera has announced a raft of upgrades to its award-winning RIP platform with the release of Caldera version 9.10. The latest updates include integration of the Adobe PDF Print Engine (APPE) 2.6, Raster2PDF, multi-page collation and Japanese language support, along with new options and extensions such as the HPGL engine, Textile Step & Repeat and enhancements to the VisualCUT+ and EasyMedia modules. In addition, monitoring production at a glance from the print shop floor is made possible with the new Print Board plug-in for Caldera's digital signage solution Variable Display.

Caldera v9.10 improves reliability, stability and compliancy, with performance-enhancing tweaks to help drive productivity and efficiency, as well as helping users meet the ever-increasing demand for their output to conform to recognised standards. CopyRIP, VisualRIP, VisualRIP+ and GrandRIP+ will all benefit from the upgrades along with a number of Caldera's popular add-on modules, including cutting and colour management solutions.

"This update includes some very significant improvements to our RIP solutions," says Frederic Soulier, Chief Technical Officer, Caldera. "We have put standards compliance at the heart of this release to help print businesses of all sizes take advantage of increased process control easily, improving their output quality and profitability as a result. The productivity gains possible with APPE 2.6, and the new tools and features we have added, make this our most comprehensive and efficient solution to date."

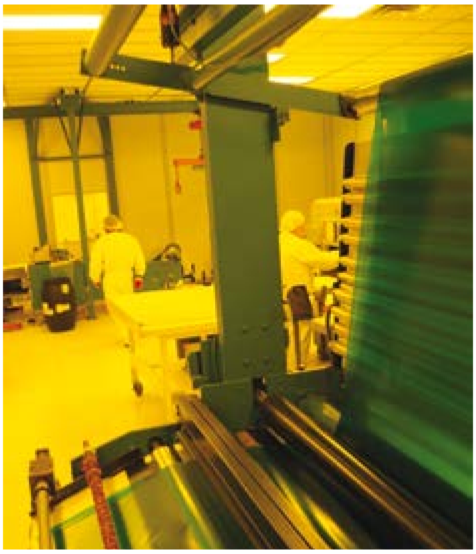
An important development for standards-driven print businesses is the new Process Control Compliancy feature for FOGRA Process Standard Digital (PSD) and Process Standard Offset (PSO). For use with Caldera's colour profiling solution EasyMedia, the Process Control option allows the printing and measuring of standardised colour reproduction charts from within the Print or EasyMedia interfaces. The module also delivers compliancy reports for ISO 12647-2, ISO 12647-7, ISO 12647-8, PSD Absolute and PSD Relative to ensure conformity to FOGRA standards in their printing processes. ■

Caldera v9-10 helps users conform to recognised standards

Ulano completes its film conversion clean room

Ulano has completed its state-of-the-art film conversion clean-room which is located in the company's main factory and laboratory complex in Brooklyn, New York. The clean room supersedes a filtered air, positive vacuum conversion facility that had been located in a separate building about 1.5 miles distant. For years, master film rolls coated in Ulano's factory had been transported to the conversion facility, packaged as finished rolls or sheets of film, and returned to the factory complex where Ulano's warehouse is also located.

By placing the new film conversion clean room literally a few meters from the coating machines, Ulano has minimised the handling of work-in-progress master film rolls and reduced intra-city transportation. Ulano President Alfred L Guercio states: "Our objective has been to meet and even exceed the cleanliness requirements of our most exacting, high-end customers in a variety of exacting screen printing applications." ■



New conversion clean-room facilities for Ulano

New pressure-sensitive adhesive gives short cycle times

Leading manufacturer of screenable adhesives Kissel + Wolf has announced a new pressure-sensitive option for decorative foils, front panels and visual instrument panels. Kiwoprint UV 92's good tack properties also make it suitable for labels and decals.

The adhesive's fast curing is of particular advantage, giving short cycle times. As Kiwoprint UV 92 is solvent-free, there are no problems with VOCs (Volatile Organic Compounds) and other environmental aspects.

Typical applications include visual instrument panels for the automotive and electronic industry, decals for bicycle and vehicle decoration, and labels and stickers for indoor and outdoor use. The UV adhesive is also suitable for printing wide-format advertising posters, either solid or half-tone; even with fine mesh counts, there is no danger of the adhesive drying in the screen.

Further special features are its water and ageing resistance as well as its compatibility with many screen-printing inks. ■

Fast curing is just one benefit of Kiwoprint UV 92

SGIA's benchmarking report provides valuable industry view

SGIA's Third Quarter Industry Pulse Benchmarking Report shows great improvement for the garment decoration community. According to the statistics, the garment community is showing strong growth, particularly in sales. These numbers are remarkable after a bleak second quarter – the stats nearly exceed those from the first quarter. Despite the strong figures and industry confidence, concern about the US economy continues to keep members cautious moving into the fourth quarter.

"SGIA Benchmarking Reports provide an industry view of how companies are growing their businesses, how they purchase equipment and how they view the health of their business now and in the future," says Dan Marx, SGIA's vice president of markets and technologies.

The full report, free to SGIA members, breaks down responses on the key topics of sales, production, employment, purchases and industry confidence. Based on Industry Pulse Survey responses, this report offers a unique look at where the community is now and new trends for the year ahead.

SGIA members and survey participants can view all of the results from the Third Quarter Industry Pulse Benchmarking Report by accessing the full report at SGIA.org, keyword: Survey. ■

Longer length Unitex squeegees now available

Trelleborg Applied Technology, part of the Trelleborg Group and one of the leading international manufacturers of high grade polyurethanes and synthetic rubbers, is now supplying its Unitex screen-printing squeegees in a new longer length of 3,750mm.

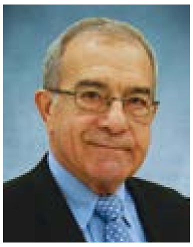
The company says that Unitex squeegees have earned a deserved reputation of providing industry leading performance and exceptional quality. As part of an on-going development programme, the products remain at the forefront in squeegee technology.

Unitex's squeegee range covers the full breadth of screen-printing applications including printed electronics, graphics, textiles, glass, bottles and containers. They are available in a wide range of hardness levels, compounds, shapes and profiles. Trelleborg Applied Technology believes that the new longer length gives even better value for money as well as additional flexibility when cutting the squeegees down to size.

Dr Linden Forsyth-Moser, Managing Director, comments: "As one of the original polyurethane squeegee manufacturers, we have more than 55 years manufacturing experience and are certified to ISO 9001 and ISO 14001. Now that we have the capability to make longer length squeegees, it provides manufacturing efficiencies, allowing us to increase output which, in turn, helps us to reduce our costs. We are committed to maintaining a market leading position of providing quality squeegees that provide technical benefits, cost savings and value for money." ■


Unitex squeegees are now available in a longer length

Gerber Innovations appoints Don Skenderian as Sales Director


Gerber's Don Skenderian

Gerber Innovations, specialist manufacturer of computer-controlled cutting systems for the packaging and graphics industries, has appointed Don Skenderian as director of sales. He has more than four decades of experience in business development, sales, marketing and product architecture.

Skenderian joined Gerber Innovations earlier this year as senior product manager. Prior to this, he was Vice President of sales for Belgium-based Esko and, before that, was employed by Data Technology, a company acquired by Gerber in 2007. He was involved in the conception and planning of the very first automatic cutting systems designed for the packaging industry. More recently he has been instrumental in continuously gathering customer feedback to determine which features users need and ensuring that modern systems deliver that functionality in the most efficient and cost effective way.

"I am honoured to be a part of the Gerber family – a company that pioneered automated cutting technology more than 40 years ago and which has been a world-leading manufacturer since then," says Skenderian. "Gerber has a presence in more than 130 countries and manufactures on a global basis. Gerber Innovations serves the global packaging industry with cutting systems it manufactures in the United States." ■

Esko and Epson announce OEM agreement

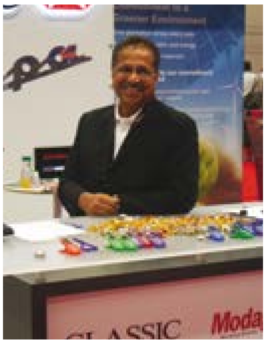
Esko has entered into an OEM relationship with Epson to provide a customised Digital Front-End (DFE) for use with the Epson SurePress L-4033A and L-4033AW ink-jet digital label presses.

"As the label and packaging market increasingly transitions from analogue to digital solutions, manufacturers of digital printing equipment are looking for digital front-end alternatives that can effectively address workflow and job processing issues specific to their industry," states Jef Bogaerts, Commercial Partnerships at Esko. "Our DFE does just that by streamlining pre-press and workflow for greater efficiency. And with Esko's Color Engine 12 integrated into the DFE, it offers Epson the ability to process files of up to seven colours to take full advantage of the capabilities of the L-4033 series presses. We are pleased to be partnering with Epson, one of the printing industry's best-known brands."

The six-colour Epson SurePress L-4033A and seven-color L-4033AW (with white ink) ink-jet digital label presses are designed for efficient high-quality, short-run label printing. The series enables label converters and commercial printers to expand their service offering and improve profitability. Now, with the addition of the Esko DFE, Epson customers will be able to take advantage of Esko's expertise in the label and packaging market to deliver differentiated digital label manufacturing that incorporates Esko capabilities that have become the standard in the label and packaging industry.

"As we continue to grow our presence in the label industry, we turned to the industry leader for additional capability," comments Mr Kitahara Tsuyoshi, General Manager at Epson. "Combined with Epson's reputation for high-quality, affordable printing solutions, this DFE powered by Esko will bring even more value and automation to customers serving the digital label printing market. As the market continues to evolve, so do Epson products and the Esko partnership is another example of our dedication to bringing our customers best-in-class solutions that help their businesses grow and grow with their businesses." ■

Modagrafics partners with leading imaging solutions' provider


Musale: "Our goal is create value for current and potential customers."

Modagrafics has entered into a strategic partnership with Classic Stripes USA, part of the Astarc Group and Navis Capital, stated to be the world's largest automotive decal and imaging solutions' provider. This commitment will allow Modagrafics to expand its North American footprint and provide customers with the most cutting-edge technologies and solutions in the industry today.

"We are extremely pleased to partner with such a dynamic organisation like Classic Stripes," says Steven Steele, CFO of Modagrafics. "Through their financial and technical sponsorship, we are looking forward to setting new industry standards for large-format screen and digitally printed products."

Kishore Musale, Chairman and Managing Director of Classic Stripes, adds: "Our goal is to create value for current and potential customers of Modagrafics through our innovative offerings, superior technology, and world class infrastructure."

Since its inception in 1973, Modagrafics has evolved from a small fleet graphics operation into an innovative leader in wide-format printing, point-of-purchase and sign manufacturing. Today, thanks to the new partnership with Classic Stripes, Modagrafics is now collectively one of the largest screen and digital printers in the world serving the fleet, OEM and retail markets. ■

Natgraph cuts costs for Fespa 2013 visitors

Keen to attract as many visitors as possible to its Fespa 2013 stand, Natgraph – Europe's largest manufacturer of conveyorised dryers and stencil processing equipment – has negotiated a special accommodation deal on behalf of its prospective guests.

The company has been hard at work researching the ExCeL venue, transportation links and the best accommodation. As a result, it has secured a large number of rooms at the best located hotels and is now offering its customers, distributors and prospects discounted rates for the Fespa period.

Alan Shaw, Natgraph's Commercial Director, comments: "We were a little concerned that some of our potential overseas visitors may consider London to be an expensive destination and that transportation would be problematic. ExCeL was one of the venues used for the Olympics and is well located, so booking reasonably priced accommodation was the only obstacle.

"Transport is convenient and well-priced, both from Stansted Airport and from the accommodation in Stratford to the ExCeL via the Docklands Light Railway (DLR). We are so excited about Fespa 2013 that we have reserved a large number of rooms, in an excellent location, with great facilities and at very special prices, to be passed directly on to visitors contacting us through our website."

Full details of the Natgraph Fespa accommodation discounts can be found at www.natgraph.co.uk ■

Nargraph has researched transport links and accommodation for Fespa 2013

GOA study projects industry growth for Latin America

A study produced by the Graphics of the Americas Expo & Conference (GOA) forecasts a positive state for the print industry in Latin America, a core GOA audience, in 2013. Produced annually by the Printing Association of Florida, and now in its 38th year, GOA is held from 21 to 23, February 2013, at the Orange County Convention Center in Orlando, Florida.

Based on statistics reported by the International Monetary Fund (IMF), the study reveals that the Latin America printing industry remained positive for most of the last decade, with a projected growth of 4% in 2013. The projected GDP in 2013 for Latin America and the Caribbean is 3.9%. National economies that are driving the growth include (projected) Mexico (3.5%), Brazil (4%), Chile (4.4%), Colombia (4.4%), Peru (5.8%), and Panama (7.5%).

"The findings in this latest report are not at all surprising to us," says George Ryan, GOA President. "The very reason for the specialisation of our show is the resounding success the printing industry is experiencing in Latin American countries. Our exhibitors and attendees are reporting growth year over year, even when the economy is not at its peak. This study is very promising and invigorating for our audience and those who serve it."

According to the study, the packaging segment has the best outlook within the industry. Another survey shows sustained growth in all three major categories of flexible packaging converters, label converters and folding carton. The growth in the packaging segment is producing changes to the structure of the industry within the entire region, and there has been an increase in mergers and acquisitions of packaging converters with high volumes. ■

BRILLIANCE OF METAL

Maria Bader presents the product series Decorex and explains technical and product features

DECOREX®

To the wide range of self-adhesive films for sign making and digital printing, which is manufactured in Germany by company "X-film Selbstklebefolien GmbH", belongs one special series for decorative and effect films.

These films with metallic and mirror-like effects for exclusive decoration have been combined into a product line called *Decorex*.

Depending on the requested features like durability, flexibility, printability etc, X-film uses different combination of row materials for face film, adhesive and release liner and offers a suitable solution for each application's request (see Table 1).

In this issue X-film gives answers to most important aspects of products from their *Decorex* series.

PVC FILMS WITH METALLIC OPTIC

Polymeric PVC films with metallic effect can be used very well for outdoor application and achieve a shelf life of up to 4 years. The perfect alternative for a short-term application up to 2 years is a monomeric PVC films. Both of these PVC films can be excellent applied on smooth and slightly curved surfaces. These parameters are valid for a middle European climate, because the outdoor durability depends on direct solar radiation and weather influence. The indoor durability is actually unlimited.

METALLISED FILMS FROM HARD PVC AND PET

In comparison to PVC films, the metallic films from hard PVC or PET "harder" and more likely to stick on planar surfaces. The gloss of these materials is, however, in comparison with the polymeric and monomeric PVC films, much higher.

Films, produced on the basis of metal+PVC sandwich, can be printed in screen printing, with UV-curable inks, eco-solvent and solvent inks.

Films with face material from polyester are printable only in screen printing. As alternative for digital printing, X-film produces special version of polyester films with additional top coating (Jetrex J-LSPG 50). Using the special top coat gives excellent printability's result on printers with UV, eco-solvent and solvent inks.

METALIZATION OF FILMS

Films from the *Decorex* range obtain their metallic colours through different production process. Polymeric and monomeric PVC films are getting the desired colour through special mixture of pigments.

The hard PVC or PET films are metalized by vapour deposition, where the metallic layer is deposited on a plastic substrate. The metallisation is made in a physical way by using of the vacuum technology. The metal vapour is generated within vacuum by high temperature and condensed on the cool substrate.

INTENSITY OF GLOSS

Decorative metallic films have different level of gloss. Different surfaces of PVC films achieve by the use of calendar's rolls with different embossing. The metalized films get their gloss level through the composition of coated mixture.

The hard PVC and PET films have a higher gloss, because they have a real metal coating on the surface.

EXTERNAL INFLUENCE ON METALLIC FILMS

Especially high-gloss mirror-like films (product names D-MXD and D-MX) must be process carefully, to avoid the scratch the shiny surfaces by external influences. By outdoor application it is recommended to seal the edges, if you apply metal+PVC sandwich films like D-MXD, as otherwise the penetration of moisture can lead to corrosion. For the easy application X-film has a special release liner technology for bubble-free dry application, which has been used for the polyester film D-MX. ■

Maria Bader is Head of Export at X-film Selbstklebefolien GmbH

Product	Face material	Thickness, micron	Opacity	Colour	Gloss	Durability, years	Printability
XF7	polymeric PVC	70	opaque	Gold, Silver, Copper	gloss	4	**
XF7T	polymeric PVC	80	translucent	Gold	gloss	4	**
D-MXP	polymeric PVC	110	opaque	Champagne brushed	matt	4	**
XF3	monomeric PVC	72	opaque	Gold, Silver	gloss	2	**
D-MXD	sandwich metal + hard PVC	75	opaque	Gold, Silver, Gold brushed, Silver brushed	high-gloss	5	**
D-MXC	compound PVC + PET	140	opaque	Gold, Silver	gloss	1	*
D-MX	PET (polyester)	50	opaque	Gold, Silver, Copper	high-gloss	1	*
J-LSPG50	PET (polyester) with Top Coat	50	opaque	Gold, Silver	high-gloss	1	**

Printability: * Screen printing; UV-curable inks
** Screen printing; UV-curable inks; solvent and eco-solvent ink jet printing

Table 1. Decorex series with metallic optic

Further information:
X-film Selbstklebefolien GmbH
Lindlar, Germany
tel: +49 2266 47785 0
fax: +49 2266 47785 440
email: sales@x-film.com
web: www.x-film.com

X-film®
Made in Germany · www.x-film.com

COMPREHENDING COLOUR IN A DIGITAL WORLD

Mike Ruff provides an insight into understanding bit depth

Mike Ruff

Like many common terms used in digital file preparation today, bit depth is something we don't have to understand to do our jobs in file preparation for printing. However, I believe that it is important to know what bit depth is if we are truly to understand file quality, even if it might not be directly related to the printed image quality due to the limitations of printing. This article will explain what bit depth is and how it may or may not affect your file or print decisions.

The easiest way to understand bit depth is to first just focus on one pixel. Raster images contain millions of pixels. Each pixel contains colour information. The depth or layers of that colour information in that pixel is called depth. One-bit colour is black or white. For example, a one-bit tiff is similar to a piece of film used to image a plate or a screen. Film would be black or clear. A one-bit would be black and white. So bit depth is the number of layers of colour or bits used to define the colour value of one pixel. One-bit colour has a possibility of two colours. Two bits can produce four colour values, four bits can produce 16 colour values and eight bits can produce 256 colour values.

The reason the number grows exponentially is because it is calculated as two to the power of the bit depth; for example, a bit depth of eight supports up to 256 colours, and 24 bit depth supports about 16 million colours. Postscript level 1 is based on 256 colour values per colour channel.

Figure one shows a one-colour image as one-bit, two-bits, four-bits and eight-bits to help you visualise the affect of greater bit depth.

Bit depth determines the maximum number of colours available to work within a file. A term of 'true colour' or 16 million colours are required for photorealistic images and video. All colour displays today support 16 million colours. (Figure 2: bit depth illustration).

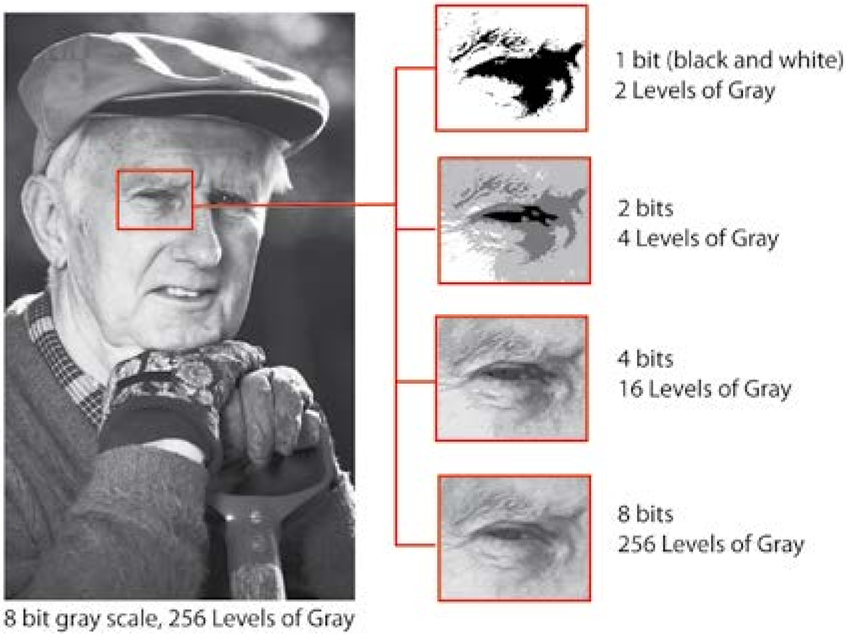
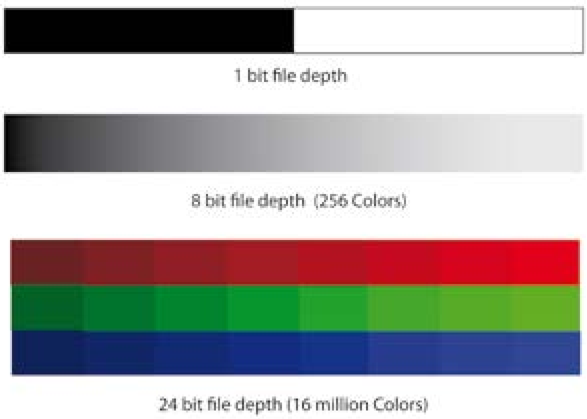


Figure 1: One Color Gray Scale

24-BIT: EIGHT-BIT COLOUR IN RGB,

If a digital file has eight bits for Red, Green and Blue it is now referred to as 24-bit colour even though it is only eight bits per colour. Eight bits of red plus eight bits of green plus eight bits of blue is 24. 24-bits gives us the possibility of about 16 million possible colours in RGB. (Actually approaching the number of shoe colours in my wife's shoe collection.) Eight-bit colour supports conventional printing

Continued over



Bit depth is the number of layers of color or bits used to define the color value of one pixel. One bit color has a possibility of 2 colors. 2 bits can produce 4 color values, 4 bits can produce 16 color values and 8 bits can produce 256 color values. The reason the number grows exponentially is because it is calculated as 2 to the power of the bit depth; for example, a bit depth of 8 supports up to 256 colors, and 24 bit depth supports up to 16 million colors.

(Figure 2: Bit Depth Illustration)

Bits Per Pixel	Number of Colors Available	Common Name(s)
1	2	Monochrome
2	4	CGA
4	16	EGA
8	256	VGA
16	65536	XGA, High Color
24	16777216	SVGA, True Color
32	16777216 + Transparency	
48	281 Trillion	

(Figure 3: Bit Depth Color Support)

just fine but now, with digital photography and image editing pre-press software that will handle more information than 24-bit, there are some advantages to go to 16-bit colour that is effectively 48-bit files in RGB – 281 trillion colours. (Figure 3: bit depth colour support)

48-BIT COLOUR: THE POWER OF 281 TRILLION COLOURS IN DIGITAL PHOTOGRAPHY

No, you are not imagining that the colour of digital files normally looks better than the prints we are able to produce. (The files look even better than the photographs made from the files.) They look better because of bit depth. High-end cameras can now capture 16-bits x three colour RGB images 48-bit. Visually, these high definition images look great but our ability to print them lags behind. Most digital printers are printing eight-bit colour, Postscript Level 1. It is really 24-bit when the image is converted from RGB – 8+8+8 = 24-bit. One thing that may help you to understand why more information has the possibility of looking better is that if you print a grey gradient with one colour (black) you will have 256 levels of grey to work with. But, if you print the grey gradient image from RGB information, you will have 24-bits of colour to work with. The software knows this and will make a smoother gradient with all the colours.

IMAGE-SETTERS AND PLATE-MAKERS

Image-setters and colour engines converting file information to film or plates are also based on 256 shades of each colour because eight-bit files have a total of 256 possible integer values per colour channel. This is why the possible number of greys in a Level 1 Postscript image-setter is dependent on having 256 pixels in each dot we are imaging. Most of the common film image-setters used for film and plates were geared to a resolution of 2,400 x 2,400 laser pixels called dpi. The reason is that offset printing was set to be most commonly printed at 150 lpi. Lpi is not dpi. Lpi is referring to lines of dots, not pixels. Each dot requires the availability of 256 laser spots to be able to represent one of the grey levels of Postscript Level 1. To determine what lpi an image-setter can produce and resolve all 256 grey levels, just divide the image-setter resolution by 16 (the square root of 256). If I do that I find that I need a 2,400 dpi image-setter to produce 150 lpi. If I have 2,400 dpi available, I have 256 pixels that can be turned off or on to be Level 1 Postscript compliant. I will have shades of all colours – like colour# 256 is solid white, #255 has one pixel on, #254 has two pixels on etc. I can have my 256 shades of grey. (I should have written a book by that name, right? It would have been much better than *50 Shades of Gray*.)

SHOULD WE WORK IN 16-BIT COLOUR (48-BIT RGB) OR EIGHT-BIT COLOUR (24-BIT RGB)?

Since Adobe Photoshop allows editing of images with 16 bits/colour channel or, as we explained, it is sometimes referred to as a total of 48-bits in RGB, it seems we would benefit from this additional colour depth in printing. We do benefit in the original file work because as we stretch, adjust, curve and use levels' tools, the files do not degrade as fast. More data is better if we have a computer that can handle it. But, in printing, I actually don't see a big benefit. In fact, there might be a negative in production speed. Do you really want to slow down your process for something you can't see? Two times as many bits/pixel means that it will take more horse-power to move this information around in your workflow. You will require more processing power as you edit and re-save. And you will need more storage space to save and archive files. A 100Mb image that is saved at two times the resolution is not twice the size; it is four times the size because it is two times horizontally and two times vertically. It is now a 400Mb file.

CONCLUSION

Test both eight-bit and 16-bit files on your digital print device and see if you can actually see the difference. If you can, then calculate the cost and determine if the market will pay the higher price you may have to charge. If you cannot see the difference with your workflow and printer, then why do it? My friend Bron Wolf used to have a sign on his wall: "Life is hard, it's harder if you're stupid." Print like electricity flows. Take the path of least resistance.

My analysis is if files are not going to be printed, but are used and displayed on high resolution monitors, then there is a visual difference in bit depth perception. There is also an advantage of working on, adjusting and manipulating 16-bit files because it adds flexibility to what you can do with a file. But, for preparing images for digital and conventional printing, I refer to a common-sense phase used by Richard Bowles of Nazdar Inks and Coatings. Richard says: "The juice is not worth the squeeze". Even though we can make better and more accurate prints than we have ever made in the past with the better colour management software available today, eight-bits per channel is all we can resolve or see in printing. Maybe printing in the future will allow us to resolve all the subtle colour shades of 281 trillion colour values. I hope so; but, for now, let's pay attention to what we can do and do it the best it can be done at a price we can sell. ■

Mike Ruff is Chief Technology Officer at Nazdar Consulting Services

Further information:
Nazdar Consulting Services,
Shawnee, Kansas, USA
tel: +1 816 304 9595
email: mruff@nazdar.com
web: www.nazdarconsulting.com

CHANGING TO DIGITAL FILM PRODUCTION

Simon Warren explains the repro benefits of employing ink-jet technology

With the switch to computer-to-plate film, traditional exposure units are becoming less popular and the choice of models continues to decline. The solution to produce repro films using ink-jet technology is an interesting alternative. To generate film originals digitally by ink-jet opens up many interesting new possibilities in the pre-press workflow. In-house film production, daylight handling, chemical free processing, layout control and the flexibility to make corrections right up to the last minute are just a few highlights of this capable film system.

In combination with a suitable printer, RIP software and optimised film it is possible to generate high quality line and colour separation films quickly and efficiently. In practice 48 lines/cm screen-print rasters and offset printing with 60 lines/cm raster is today already a reality.

Folex's head-quarters in Switzerland

PRINTER EQUIPMENT

To achieve a high ink coverage (UV-density) specific printers are required which enable users to print in high resolution and high drop volumes (dot size). A high copy density is achieved only if black is printed with black ink (K) only.

Unfortunately the necessary driver settings cannot be used in a standard printer driver. Therefore special RIP software is also recommended and required. Depending on the RIP it is also possible to modify the print layout, produce half-tones and create colour separations.

Recommended printers are Epson with the Stylus Pro Series being the current market choice. Other printers in combination with a suitable RIP may produce acceptable print results.

INK-JET INKS

Pigment, dye or eco-solvent inks (a different film is required for pigment/dye and eco-solvent) can be used. The ink type used is normally dictated by the printer. Prints with pigmented and eco-solvent inks offer longer term light resistance with better water and smudge resistance. Prints with dye inks are more prone to image shifting and fading.

RIP SOFTWARE

For critical raster and colour separations we recommend the use of a specific RIP software such as Colorgate's Filmgate, Wasatch SoftRip, Perfectproof, Ergosoft Posterprint or similar. These special tools ensure that accurate printing criteria can be met along with offering a choice of options to achieve the optimal print targets, regarding:

- Ink load
- Ink drying
- Density
- Half-tone raster
- Colour separations

To select the print settings (parameters) two guidelines need to be considered:

Simon Warren

PRINT PARAMETER GUIDELINES – SCREEN-PRINT

The special RIPs for screen separations offer for each application an optimal choice of parameters. Depending on the software supplier a variety of pre-adjusted printer settings is included in the software. The individual configuration of the respective print settings can be chosen quickly and easily for the selected print job. The following details have to be considered:

Raster widths	Lines per inch/centimetre (lpi, lcm)
Type of raster	PS-, AM- , FM- raster etc
Dot shape	Dot (round), ellipse etc.
Raster angle	Possible standard C:82.5°, M: 52.5°, Y:7.5°, K 22.5°
Special colours	Pantone etc/standards

PRINT PARAMETER GUIDELINES – INK-JET PRINTER

A number of other settings is necessary to manage the printer. If the parameters are correctly selected a film print-out with excellent line, dot quality and high UV-density is guaranteed. The range of settings available is usually dependent on the printer and driver. The following parameters are normally available:

Print resolution	Dots/inch (dpi)
Droplet size	Picoliter (pl = one billionth of a litre) or droplet size (ie small, medium, large)
Dot variation	Fixed dot, variable dot
Passes	1 pass, 2 pass, 4 pass etc. (Print-head cycles/print pass)
Print Cycles	Uni-directional, bi-directional
Colour Output:	Monochrome (black)/colour print
Ink Load %	Correct ink-limit, ink-load (dependant on RIP specific settings)
Colour Management	Calibration, profiles, rendering intents

Digital Printing division is one of four group business units at Folex

EXPOSURE AND DENSITY

To expose light curing printing forms (screen-print stencils, offset plates, flexo plates etc) film originals with high density image areas are required. For many years silver halide films have been the primary choice. The performance of the required blackness (density) is measured by the spectral absorption properties of the film. The spectral sensitivity range of the printing form has to be considered. (For instance, screen-print emulsions are sensitive in the UV-Range).

The density can be measured with a densitometer. This means a quantitative measurement of the colour density. For transparent films special transmissive densitometers are used. Unfortunately today there are only a few UV-densitometers

Continued over

The Folex brand has a strong heritage of quality and consistency

available on the market. One of the most popular is the Diazo/Silver Film Densitometer X-Rite 369.

LINEARISATION

With basic settings (not calibrated) ink-jet printers produce a rather high ink deposit and dot, line width. To acquire an accurate half-tone reproduction it is necessary to carry out a so-called linearisation.

Considering the previously mentioned setting parameters for the ink-jet print such a linearisation should be made for each screen-print related raster width. The RIP software available offers a step-by-step guide which could be as follows:

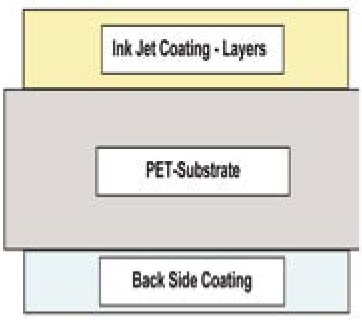
1. Choice of the screen-print process parameters

- Dot shape
- Dot count
- Raster angles

2. Choice of the ink-jet print parameters

Depending on the printer we suggest users should pre-test first with a few prints to find an optimal printer setting which reaches the

Reprojet P HD clear transparent polyester film for positive or negative film separations



Film construction, showing print and reverse sides

Clear film on a coating machine

required minimum blackness (density DUV >3). We recommend the use of a densitometer.

Note: an unnecessarily high density results in slower ink drying, higher ink costs, bleeding of ink in dot and line elements (filling in), over-saturated and scratch sensitive image areas.

FILM CONSTRUCTION

Film print side

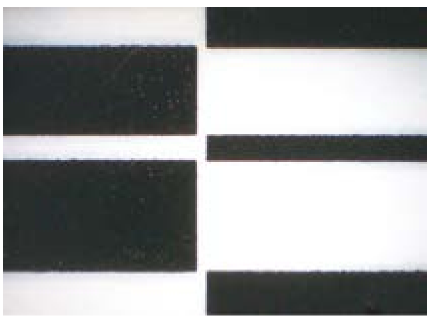
- fast ink absorption
- fast drying
- high ink coverage
- optical transparency
- resistance to humidity
- mechanical stability
- good contact and gliding properties
- dimensionally stable

FILM REVERSE SIDE

Anti-curl coating

- good gliding properties
- mechanical stability
- optical transparency

Reprojet ES CL specially coated, highly clear transparent polyester film for the production of full tone separations



Line reproduction with Reprojet P HD

Sophisticated coating lines ensure quality

LINE REPRODUCTION WITH REPROJET P HD

Requirements for the ink-jet film

- Printable with standard wide-format printers
- Use of water-based pigment, dye or eco-solvent ink
- High ink absorption
- Fast ink drying
- Roll-to-roll printing (for large format use)
- Good line and dot reproduction
- High density DmaxUV: > 3
- Possible to produce rasters up to about 50 L/cm
- Good processing in the copying frame
- Mechanical resistance
- Very good dimensional stability
- Durability/re-usability

ARGUMENTS FOR REPROJET P HD AND REPROJET ES CL

- Production of repro films without traditional film-setter
- Chemical-free process
- No darkroom
- Good durability of the film material
- No limited shelf life
- Cost effective in-house manufacturing of repro films
- Independence in pre-press
- Flexible workflow
- Corrections possible shortly before printing
- Archiving of print jobs in digital form
- No archive space required (saves space)
- Use of ink-jet printer for proofing, posters, etc

SUMMARY

Today there are many opportunities to create high quality work for use in screen, pad and flexo printing when combined with an ink-jet printer, dedicated RIP and ink-jet coated film. Help and advice are always available when selecting the right, optimised Reprojet film for a printer and application. ■

Simon Warren is Product Manager at Folex

Further information:
Folex AG, Seewen, Switzerland
tel: +41 41 819 72 47
email: Simon.warren@folex.ch
web: www.folex.com

PERFECTING COLOUR ACCURACY IN AN EVER-CHANGING WORLD

Shoshana Burgett and Stephen Miller discuss how today's specialist tools lead to consistency

During the past five years the printing industry has evolved faster than at any time since Johannes Gutenberg invented movable type. For companies that start to think in terms of touch points rather than point size and marketing campaigns rather than M weight, the possibilities can be endless for new ways to improve the bottom line.

Traditional printers used to produce materials by the pound for a public accustomed to one-way static messaging; but the new breed of printing companies is expanding its product and service offerings to take advantage of multi channel communication – everything from quick turnarounds of printed pieces with personalised messages to reformatting content for e-readers, tablets and smart phones.

Consolidated Graphics Inc, a Houston, Texas-based general commercial printing company with 70 printing operations spread throughout 27 USA states, touts its ability to provide an array of multi-touch marketing solutions to customers – reaching out to target audiences with variable-data direct mail, personalised URLs, viral videos and text messages on mobile computing devices. Using these tools, a campaign becomes an interactive experience between the company and potential customers, with analytics that show which media proved to be the most effective.

One member of Consolidated Graphics family of companies, Anderson/LA in Los Angeles, has found effective web-based tools to take the place of an in-house colour expert or outside consultant who often was necessary to have at the plant to maintain good colour quality.

"Over 60% of the printing companies that care about colour quality have to rely on a full-time colour guru or hire a consultant to create profiles, calibrate equipment, and tweak jobs for good colour results," says George Mendoza, director of Premedia services. "That can be expensive. The alternative is a centralised, automated system, preferably managed via the Web. With dollars for colour R&D becoming scarcer, the automated approach makes a lot more sense."

Anderson's growing point-of-purchase business drove the company to find a centralised colour solution. Clients wanted Anderson to maintain high colour quality on point-of-purchase signs, window graphics, and vehicle wraps that were made on four different printers that did not communicate seamlessly with each other.

By profiling the company's grand format printers on common substrates, Anderson was able to reduce some tasks that took up to four hours to only one hour.

Anderson's problem of getting all the equipment to "play nicely" together is common in today's print operation. Technology has moved at such a rapid clip that it's rare to find any printing company that has equipment all made by one manufacturer, and companies often have to co-ordinate the work of both analogue and digitally based equipment.

It's now reached a stage of hybrid production, where a project may have a life cycle that takes it from digital printing to flexo or litho and back, in addition to content for e-readers such as iPad, Kindle and Nook, wide-format printing of point-of-purchase displays and websites. All of the variations of the same content require reformatting and rework to produce the desired deliverables.

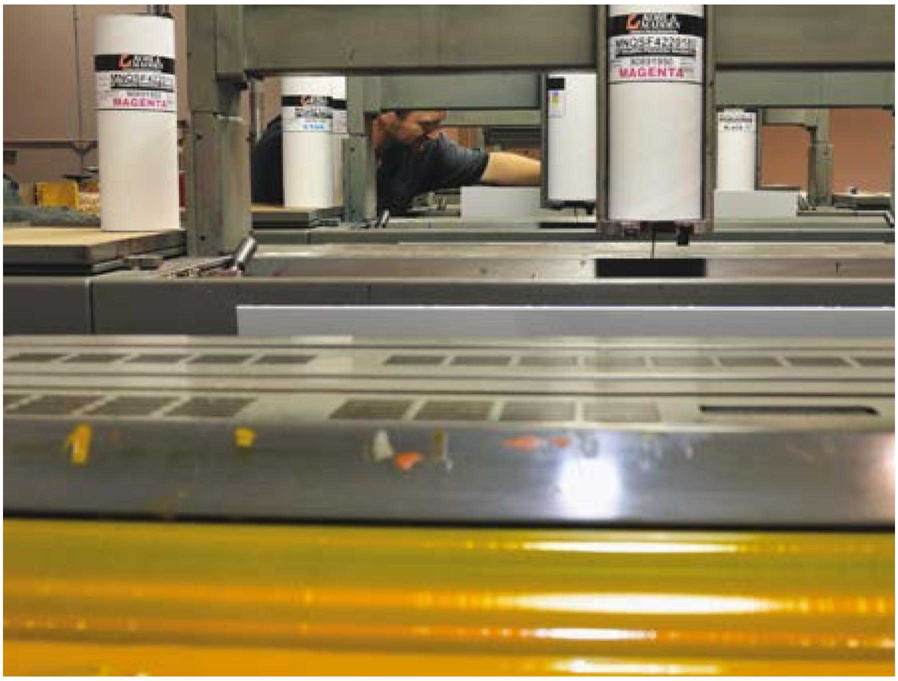
Though it sometimes can be a bewildering experience, some basic rules still guide companies as they navigate the landscape of today's print industry.

THE LANGUAGE OF COLOUR

Thankfully, the language of colour remains the same in today's environment of hybrid production. If anything, new tools are making it easier than ever for designers and creatives to identify exactly what colours they envision, what colours the brand owners approve, and what colours are expected during the production process.

Twenty years ago, the printing industry had built a virtual Tower of Babel out of competing colour management systems, formats and notations that didn't translate accurately or easily. X-Rite Pantone has unified the language of colour with embedded software and spectral data that helps the whole value chain manage colour effectively.

A designer now can precisely identify the colour of any inspiration item at a work-station or on the go with the Capsure pocket-sized instrument that compares the sample with thousands of colours from the Pantone Matching System that are stored in its memory. Pantone, the industry leader in colour standards and nomenclature, has an extensive colour library for Capsure, as well as other tools such as traditional fan decks, formula guide, a phone app for measuring colours, and the Pantone Color Manager software that imports



Pressman Joey Clark checks the colour quality of work at the Consolidated Graphics-Mercury Printing operation in Memphis colour values into design programs such as Adobe's Creative Suite and Quark.

The industry has stepped up its game through the increased use of spectrophotometers that yield spectral data, instead of densitometers that provide little guidance in predicting instances of metamerism. Metamerism occurs where a pair of samples matches in colour under one light source, but do not match under another light source.

X-Rite's Color Exchange Format (CxF®) is a digital format that allows companies to communicate complete spectral data that are not part of the standard ICC workflows. The format is an XML container that can include rich data to make colour and appearance better defined so that colour can be communicated accurately through CxF aware applications and solutions. CxF is freely available to developers so they can enhance their solutions and provide high levels of colour information for their users.

A format called X-Rite Graphic Arts Standard (XRGA) make it quicker and easier for companies and professionals involved in digital production printing to adhere to ISO standards and have confidence that data sent or received from all links in the supply chain is reliable and repeatable. XRGA is a language for multiple devices to communicate to a known and defined standard, enabling customers to work more effectively in today's complex business process.

QUALITY STILL COUNTS

Any marketing piece – a printed brochure, an e-mail invitation, a cling wrap for a store window, a corrugated point-of-purchase display – has to look good to be effective. And here tried-and-true principles still hold: colours need to be printed or rendered as they were intended, and type needs to be crisp.

Successful printing companies are well aware of this rule in their established business, and generally all they need to do is apply the same care to what may be a new medium.

For instance, a commercial printing company probably manages its colour using equipment such as an X-Rite-eXact spectrophotometer to check colour of a specific area on a piece, an IntelliTrax or EasyTrax color bar reader, an iC2 Plate reader, iQC Print software for ink formulations and NetProfiler 3.0 to made sure all instruments are measuring to a set standard.

Both the eXact and the new i1Pro 2-second generation spectrophotometer have forward-thinking colour management tools that allow pre-media and production to measure in the various M Standards which are based on varying viewing conditions. As well, many of the industry leading digital presses have X-Rite spectrophotometers embedded within the press, taking colour measurement data in real time.

But that same company may not be familiar with the instrumentation and tools used at the design level or prepress. Fortunately many of the same principles of colour science remain the same among the various media.

Displays for computers and tablets, printers and projectors can all be profiled and colour calibrated through the use of new tools such as X-Rite's ColorMunki, an all-in-one spectrophotometer designed specifically to work within the creative community. To make sure that the colours appearing on displays match those rendered at proofing and printing operations, X-Rite also has developed a range of i1 colour management tools to meet the needs of photo, pre-media, digital pressroom and publishing professionals.

For instance, X-Rite's i1Profiler system provides customers with an easy way to manage colour by creating high quality, precise, custom colour profiles for monitors, projectors, proofers and conventional/digital presses. With the i1Publish Pro that includes i1Profiler software and an i1Pro spectrophotometer, customers can create digital files with up to eight colours (RGB,

Continued over

Today's print companies benefit from centralised colour solutions

CMYK and CMYK plus any four) and share the data files with any stakeholders in a project.

The i1Profiler software allows users to combine images, spot colours or captured colours when creating profiles and to access Pantone colour libraries. When used with an i1iSis automated chart reader, the software package can compensate for the effect that optical brightening agents (OBAs) will have on colour renderings.

Other i1 colour management tools such as i1Display Pro and i1Publish are targeted to specific needs of customers. The i1Display Pro uses an advanced colorimeter and software to create profiles of displays and projectors that take into account ambient light conditions, while the i1Publish is geared for graphic arts professionals who need to organise pre-press workflows using digital standards, including new assurance validation and verification functions.

But regardless of how many instruments are used in the process, a person has to evaluate how the colours of an item will look when they are placed under the same illumination as where they are to be sold or used – illumination that is often specified by the customer. And there isn't any substitute for the human eye when it comes to making those judgments.

Pantone recently introduced Pantone D50 Lighting Indicator stickers that help prevent against costly mistakes due to metamerism. Under proper D50-range lighting at 5000K – the recommended illumination for accurate colour evaluation – the two patches will appear to match. If the light is not in D50 range, the two patches will appear different, with the contrast increasing as the light source deviates from D50.

GET ON THE CLOUD

One of the biggest challenges for companies involved in hybrid production is to get colour consistency – to the degree demanded by brand owners – among the various printing processes that may be spread around the globe.

Using the newly launched PantoneLIVE colour service, companies can cut time for approvals at prepress and produce improved colour matches of labels and packaging regardless of the printing process or substrate used.

PantoneLIVE is an internet cloud-based colour service that consists of libraries of licensed colour data and related metadata, software that integrates the colour information with solutions in the workflow stages and advanced colour measurement technology. A customer that uses PantoneLIVE decides on a digital colour standard can be accessed anywhere, any time and by any stakeholder – designer, specifier, printer, ink manufacturer – that has obtained an access licence from Pantone.

Since all printing processes and equipment are not equal when it comes to range of colours they can produce, a company can use PantoneLIVE to designate a universal standard for a colour that satisfies the needs of the specifier, yet can be produced by all printing technologies within practical tolerances.

The UK based subsidiary of food giant H J Heinz Co this year used PantoneLIVE to manage colour across different printing processes on paper, plastic film and other substrates for its Heinz Beanz brand. Nigel Dickie, director of corporate and government affairs for H J Heinz Company Ltd said PantoneLIVE gave the company "unprecedented control and consistency from different print processes and materials." Using PantoneLIVE, Heinz saw the colour variance of labels and packaging produced on four-colour litho, flexo, corrugated and gravure printing cut in half.

THERE'S ALWAYS HELP WHEN INTEGRATING A NEW PROCESS

Due to the breakneck pace of advances in hybrid production, no one printer or graphic arts company can keep current with changes in on-demand printing, variable-data printing, e-readers, video and other technologies.

X-Rite experts can show graphic arts companies how to improve computer-to-plate workflows that deal with variable data formats such as VIPP, IPDS, PPML, AFP, and PDF/VT, or provide ways to optimise the colours of digitally produced images. X-Rite continues to lead the industry in research and development of new products that answer the needs of fast-changing technology, such as ways to calibrate the displays of mobile devices so colours are rendered accurately.

X-Rite can help speed the evolution of companies with hybrid printing operations into the next generation of graphic arts corporations with hybrid production capabilities – truly taking printing into the 21st century. ■

Shoshana Burgett is Strategic Marketing Director and Stephen Miller is Product Manager of Digital Printing Solutions at X-Rite Pantone

Further information:
X-Rite Incorporated,
Grand Rapids, Michigan, USA
tel: +1 616 803 2100
email: mhamm@xrite.com
web: www.xrite.com

NOVACENTRIX®

Announcing the PulseForge 1200

LOW-COST PHOTONIC CURING TOOL FOR R&D

Photonic curing is the high-temperature thermal processing of a thin film using pulsed light from a flashlamp. **NovaCentrix is the leader** in photonic curing technology with the PulseForge® family of tools.

STATE-OF-THE-ART FEATURES

- Total cure area: 150mm x 300mm
- Moving, synchronized sample stage
- Max processing speed of 30 meters/min
- Adjustable height stage for 3-D samples
- Built-in instrumentation connections and data ports
- Pulse duration from 25 microseconds to 10 milliseconds
- Pulse increments as short as 1 microsecond
- Pulse spacing as short as 20 microseconds
- Maximum pulse rate: >kHz
- Advanced multi-touch display and interface

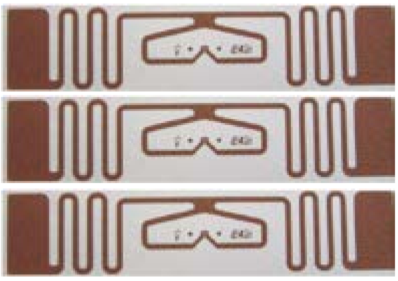
SAFETY FEATURES

- Fully CE Mark compliant
- Safety interlocks on sample drawer and access panels
- Status indicators on interface screen
- Sealed sample drawer with integrated exhaust ventilation

Accessories include: SimPulse™ Thermal Simulation, Process Chambers (static and pass-through), Bolometer, Sample Holders, Optimized Lamps.

Metalon® inks

Formulated for maximum conductivity *and* printability.



HIGH PERFORMANCE

- sheet resistance of 5-10 milliohms/sq
- silver and copper ink
- excellent adhesion

GET STARTED NOW

- low-cost R&D print kits available
- as low as $75/kg in bulk for copper inks
- fast development of tailored formulations

Our expertise runs deep, and our PulseForge tools and Metalon inks put that experience into practice.

PHOTONIC CURING EXPERTS.
CONDUCTIVE INK EXPERTS.
LET US HELP YOU MOVE FORWARD.

BEGINNING IN Q2 2013, NOVACENTRIX WILL ADD R2R PRODUCTION PRINT AND PROCESSING AS A SERVICE TO OUR CUSTOMERS.

To learn how NovaCentrix can help you, or to have samples printed and processed, visit us at **www.novacentrix.com**

EXPOSE THE QUALITY

Alan Buffington details the importance of print engineering in T-shirt production

Screen-printing is unique among printing methods. It can vary from a printed medical circuit to a 14-colour simulated process masterpiece on a T-shirt to a 100-screen fine art serigraph. While the print process is very similar, squeegee, mesh, ink, and substrate, it's the art that we use to make the screen that is unique to the product being printed.

Circuitry requires exceptional art and masks. The art cannot contain errors and requires very exact tolerances to avoid mistakes where the inks or process can be extremely expensive. Most electronics' screen-printers use high-contrast films that produce only single-colour, solid-tone images in black and clear. The edge quality of the art, as well as the spacing of the traces, is best handled by a real film image-setter over an ink-jet imager with a far higher resolution to produce crisp straight edges for trace printing.

Industrial printing can deal with unusual surface features, odd shapes, bottles, fine print copy, and cosmetic requirements that are better with an image-setter as well. However the details in the art, use of tonals, and fine copy are all better on an image-setter where resolutions can be in the 4,000dpi range or higher versus the typical 1,440dpi range of ink-jets.

Textile printing of all the print techniques encompasses many different types of art, from solid spot colour to four-colour process to simulated process printing. The choices of mesh, emulsions, squeegee, press print sequence and press adjustments can be overwhelming. Even if a shop manages to find its own recipe of mesh counts, emulsions and press controls, the way the print is engineered in the art department determines how well production will run and how well the design sells. Too often the hand-off of art to production is not managed well. If the art department doesn't know what works in production then profits will suffer. If print production doesn't know how to communicate in art and RIP terminology to the artist and separator, the prints may not achieve the quality of the original art.

No matter how good the art department or production manager skills are, print engineering begins the moment artwork is received. Almost any T-shirt printer or ad speciality printer has been handed a business card or is sent the logo from an e-mail signature when the customer is asked for artwork.

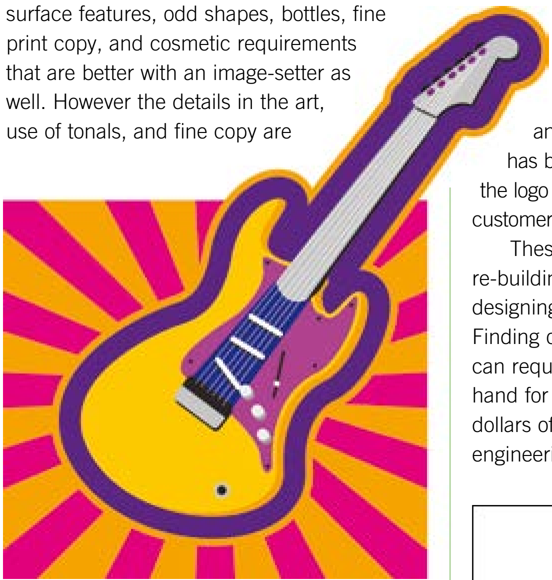
These type of jobs often require re-building art that is often more difficult than designing the customer a brand new logo. Finding out you can't locate an odd type-face can require painstaking editing of the art by hand for an order that may create only a few dollars of profit to begin with. So print engineering begins with the sales department.

THE FIRST RULE

Starting with rule one, "Just say no" is a phrase I would impress upon your sales staff. I had a young aggressive sales guy once who, on his first day, went out and returned with ten orders, and ten business cards for the art. He spent the next week trying to pull high resolution art out of the clients after showing them how difficult business cards can be to reproduce and it cost us credibility with the customer by not knowing what art to ask for. Recreating art is very expensive and time consuming, yet too many times an art file is provided that won't work. I have had sourcing buyers from major companies who have advertising agencies hand me a business card and expect miracles. So learning to say "no" can help you and your customer achieve a better product.

For today's apparel printing we need digital vector art, or a bitmap version that is twice the size of what is needed for the final print at a resolution of 150dpi minimally, or 300dpi if it is to final size, especially if half-tones are to be used in the print process where tonal transitions need to be smooth and dramatic in the final print. The more data in the art, the easier it is to use filters and separation techniques that yield good positives for your screens.

So let's say the customer has provided art, at a decent resolution. To the customer this can be a photograph of the subject with a very busy background and they want to add their boat name. Is this really artwork you can use? Well – yes, but you will spend a ton of time in Photoshop trimming out the subject matter from the background as well as formatting it with type and playing with the layout. This is another area



Original vector art used for business cards

Close up of low resolution which will not reproduce well in print

Business Cards and Web Logos are not acceptable forms of artwork for T-shirt separation

Boat owners love shirts but often fail to realise the amount of work needed to extract the art of just the boat

where the customer may think they have provided art when he really has just provided a component to make the final art. Customers like this can be shocked when they are told how much it will cost to create their concept before separations begin. Ignoring the amount of art labour to produce the job can eat up all the profits you might have been able to make.

Let's assume the customer has brought in art that is ready to separate. It's 300dpi and to size. All we have to do is run this through a separation program, or spend some time pulling out the colours with index or curve methods. Right? Hardly. Print engineering also needs to look at the design itself. Too many times novice artists design the art to be a solid print. Like this photo of the owner's sailboat on a bright sunny day, it may require the base plate to be almost solid to provide a white plate for the bright colours to pop off of. The key is to address art issues early in the process to avoid adding extra labour and costs after the job is accepted.

THE CHECKERBOARD RULE

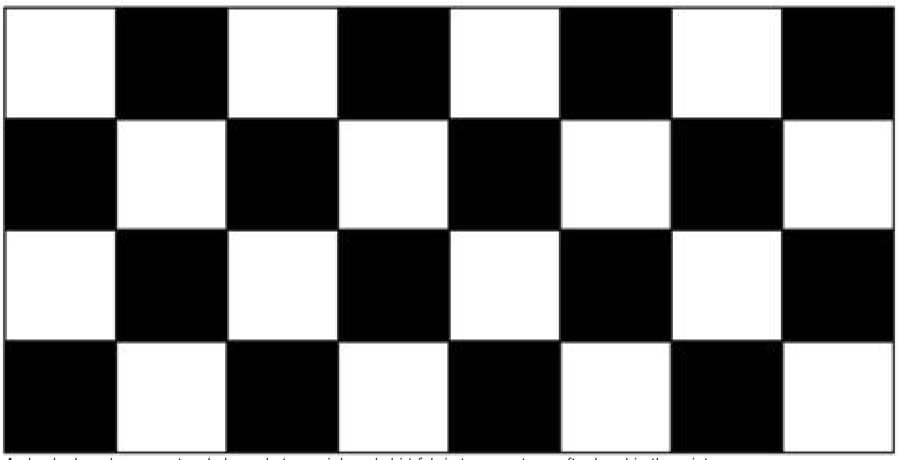
So, onto rule two. Does the design have air in it? I have found that a checkerboard is an easy way to visualise this. You have black and white in a 50/50 balance. 50% of the design can be viewed as air, the other 50% as solid. The concept is you need areas of either dark inks printed without a base plate, or use the shirt colour within the design for the 50% air portion. The base plate is the other 50% that is solid ink. We need air in the design so that the print can

Example base plate for simulated process print. There are very few solid areas of base plate showing as most is half-tone

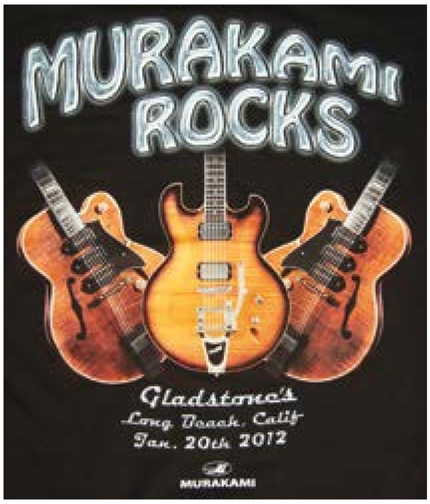
breathe and not be a solid piece of plastic on the front of the shirt. This is more important for plastisol prints than water base or discharge. Water-base and discharge have one great design advantage; you can have solid saturated art that will breathe when printed. Print the whole shirt with discharge, 100% solid colours everywhere and the entire print will breathe, and the hand of the print will be as soft as the shirt.

Plastisol, on the other hand, needs air. A solid base plate with solid colour overprints within the base plate are extremely hard to print without a lot of flashes. Wet onto wet colours will migrate into their neighbour and blur, edge quality will suffer, and ink colours in the solid area may orange peel or have different shades. By using dark inks without a base plate, and incorporating shirt colour as part of the design, it will allow the print to be softer and breathe well for a better customer experience.

Minimise the use of a base plate as much as possible, or break up a solid base plate with 60 to 80% tonal values to incorporate air in the solid print areas instead of 100% solid base plate. Some very solid pieces of art without tonals unfortunately will still need 100% ink, just try to design it so shirt colour or a dark colour breaks up the solid areas.



A checkerboard represents a balance between ink and shirt fabric to promote a softer hand in the print



An actual print with overprint colors showing how excellent colour dynamics can be achieved without solid baseplates.

Once we have analysed what is going to be air and what is going to be solid we can make the judgment on borderline colours that may or may not need a base plate. The more colours you can get to print on the shirt fabric rather than a base plate, the easier and faster production will be. Also, if the design has good light to dark dynamics and tonal transitions, the more you can use half-tones in the base plate, which overprint far more easily than solid inks over a solid base plate. Smaller areas and half-tone areas will flash much more quickly than solid plates. If the base plate can stand alone as a good graphic with excellent dynamics of light to dark tonal transitions it will print colour overprints very well. If the base plate is solid and lacks good light to dark dynamics, the design needs air built into it to avoid a heavy hand; again, this can be shirt colour or dark colours printing directly onto the shirt. The base plate has to be a grey-scale masterpiece of art to make a good simulated process print. If the base plate doesn't have incredible art, the rest of the colours printed won't help.

The more you can print ink colour right onto the shirt without a base plate, the easier production can be. An example would be a medium blue. It may be too dark when printed straight onto the shirt as called out in a PMS number mix and, when printed on a solid base plate, the colour may be too light with wet-onto-wet printing. Modifying the ink with some opacity by adding white or a tiny bit of puff ink and going to a slightly lighter shade can help when printing on a black T where the shirt colour will pull it back to the desired blue. Large solid areas should be avoided, art should be broken up graphically or type-faces reduced in weight to avoid opacity issues. The eye will often miss slight colour variations in thin art, but the eye will also pick up slight colour variations in large solid areas. Other typical ink colours that don't need a base are medium to dark greys, earth-like greens to olive greens, deep maroons and purples.

You can also use clear base to stain the

Continued over

shirt fabric to create tone-on-tone effects. Quite often these types of colours can be placed in the print sequence before a white base ink. A print sequence of a clear, then a dark purple and blue can be printed wet-onto-wet before the white base plate. This allows two to three ink colours to be flashed by the base plate flash, opens up more print-heads on the press and will eliminate any overprint print blur where it contacts the base plate. With the base plate printing right after inks that can be printed directly on shirt fabric, the edge quality of the white is sharper than printing dark colours after the base where the print can smear along the white edge.

COLLABORATIVE EFFORTS

Print engineering, combined with the right type of screens, allows the screen-printer to produce prints that are soft to the hand, exhibit excellent colour reproduction, and can really make the difference between landing that big account or being passed over. Print engineering is a collaborative effort. Too often the production department and the art department do not meet often enough. Artists assume that a 110T will cover all base plates, while the production manager takes a look at the half-tone in a base plate and switches it to 225-S. Both need to sit down and figure out the mesh call-outs and sequence of every job before art is sent to the screen room where time is precious. I often required all incoming art to be colour photocopied so I could write up the mesh counts I wanted. Art is rarely the same type of art or subject matter and each needs to be analysed for the following:

1. Is there enough air in the print?
2. What colours can be printed directly on the shirt?
3. What colours need a base plate? What other colours do I need to use as a base plate in addition to white? (It may be more than just white). Red, for example, looks better printed over a red base plate than white where it can lose strength.
4. What mesh count does my base plate need? (Murakami S-Mesh is leading the way in printing half-tone base plates with brilliant white prints and a soft hand.) 150 threads/inch can hold a 45 and 55 line half-tone very well, as can a 135S with a 50 line half-tone.
5. What will be the sequence of the print? (Beware: The sample department determines the ease of production. They need to mimic an automatic press. The sample department can create samples with many more flashes than the press has. The sequence they develop must be duplicated on the automatic press exactly.)
6. What inks will I use?
7. What are the reference colours in the print? (Like Coca Cola red for example.)
8. Are the detailed areas of the job better in a half-tone or in stochastic dots? (The smaller the print area the better stochastic looks compared to half-tones.)
9. Are there enough print-heads to have a cool-down station after every flash?
10. If the press doesn't have enough heads for a cool-down station, what colour would print in the station after the flash? Typically a small print area, combined with a slow flood speed and a fan, can cool down the pallet enough to prevent hot tack issues.
11. Will the print sequence be able to run non-stop?
12. What is the best mesh recipe for the print? (This is the domain of both the production and art departments. Too often printers receive screens with mesh called out by the art department that need to be changed to mesh counts that will print better.)

Not surprisingly, neither the art department nor the production crew can answer all of these questions without talking to each other.

CROSS-TRAINING

Rule three is to cross train each other. Print engineering involves the knowledge of the press operators and production manager merged with the art department's separation ability and RIP knowledge to separate the art into discreet colours that have been engineered to print well.

The art department and sampling department are capable of creating prints and sequences that are unachievable by production. Production needs to express what it needs to print production well; after all, that is where most of the billable dollars are created. The art department needs to think like a production manager so that the press operators can set up a design and print non-stop as soon as possible. Predictable print results yield faster set up times. There is nothing worse than playing with different sequences at 3pm on a Friday afternoon for a job due at 5pm that started set-up in the morning.

After production is started in the morning a production manager should sit down with the art department head and go over new artwork jobs.

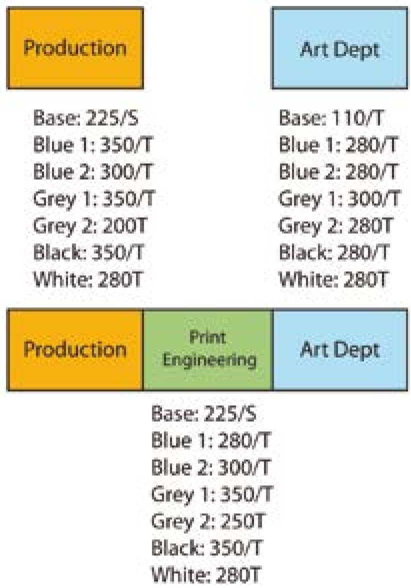
A printer may see that the black detail print would hold better detail on a higher mesh count that needs to print over a base and other colours, while an artist may assume it's just a detail black that would be okay on a 280T. While not incorrect for most purposes, the production manager may want to minimise dot gain and hold fine tonal values that would easily smear if printing the black detail plate on top of other colours.

Print engineering requires being an artist and a production manager at the same time. Mesh selection should have production's input; how many flashes to be used on the job determines how many colours the art department can separate. If you include the sales department in a weekly round table of best practices, they can begin to analyse what the customer provides for art and what their company is capable of. There are many steps and choices between receiving a file and shipping the goods that require cross department communication and training.

In one of my previous jobs I was amazed at how the art department would create simple designs that were terrible prints, and this was for a world famous sportswear company! Just because large solid letters on a school colour background on a black shirt looks dynamic on a computer screen doesn't mean it will look great when printed. Designers need to realise they are creating a garment as well; the print has to drape correctly along with the shirt fabric and be wearable. Large solid areas of print, no matter how dynamic on the computer screen or CAD file print-out, can create difficult plastisol prints.

THE IMPORTANCE OF SHAPE

The shape of the art also plays a role in quality. Rectangles and squares simply don't reproduce well on a shirt. A shirt is flexible and, once pulled off a sticky pallet, these shapes never look correct. Print engineering would solve this. Avoid straight horizontal solid shapes. Introduce some curve or type warp to the design to hide the distortion of familiar



Both art department and production need to work together for better results

Geometric shapes often become distorted after the shirt is pulled from the pallet

shapes. Circles fall into this category as well. Instead of nice circles you can wind up with football shapes or distorted blobs. The outer edge of the art should be broken up, never straight, as found in geometric shaped art.

Each piece of art that you create or that is provided to you needs to be analysed for how it will print; what are the problem areas that could pop up? Only the print manager and the artist working together as well as learning each other's craft can print engineer a design.

The other suggestion is what we called 'tear down' at my shop. Every Friday we pulled sales, the production manager, and the art department manager into a room and put up samples of that week's best and, more importantly, worst prints. Both are a learning opportunity. The production manager may have switched from a 150/48 to a 225/40 to get more tonal capture and the art department needs to know why it was done. Some of the most simple spot colour jobs with large print areas on a black shirt can be some of the most problematic – double base, double colour to achieve the design that may have only averaged 200 pieces/hour, while a stunning simulated process shirt for a gaming company that looks far more difficult to print can run smoothly at 700 pieces/hour non-stop. The difference comes down to print engineering.

One company I have visited has a Wall of Fame and a Wall of Shame on the production floor to let the printers know what is working well; the same applies to art and production. Print engineering is a collaborative effort of the entire company.

1. Know what art can be reproduced well and what can't. (Salesmen need to learn to just say "no" sometimes, as in rule one, or charge accordingly and not give away profits.)
2. Know what mesh counts and thread diameters produce better prints. (Art departments should be given sample prints with mesh call-outs so they can analyse and compare incoming art to apply best practice solutions in the past.)
3. The art department and sampling need to know print sequencing. The print sequence of a good print type can be documented. Again some excellent print samples in the art room can tell a story, provide mesh call-outs and print sequence so the artist thinks like a printer. Also provide a recommended print sequence for the sample department to speed up their efforts.
4. Know how half-tones work, what angle? What frequency? For what mesh count? What can half-tones do well? What areas would stochastic work better? One of these areas would be small faces in a print; stochastic dots can hold more detail in a smaller area, while half-tones have finite rulings that can lose details in small reference print areas.
5. Know what ink colours can print without a base plate. The less base plate the better.
6. Know what ink system to use for a given design.
7. Know with a degree of predictability how the design will look when it is printed in production. I saved this for last because this is the money-maker. Combining print knowledge and the art department skills can create jobs that set up faster and get approved quicker. If you don't hit what I call the downhill point in a print run by the 50th print, then your print engineering needs improvement. If you find that at print 200 to 300, after fussing with the design for an hour you need to change the sequence, art, or reshoot a screen on another mesh count, then this is part of the learning curve. Refining the print engineering in 'tear down' meetings, collaboration of art and production, and using screen products that can help you achieve better results are keys to more profitability, less frustration and finger pointing in the shop, results in a more profitable company. ■

Alan Buffington works in Technical Sales at Murakami Screen

Further information:
Murakami Screen USA, Monterey Park, California, USA
tel: +1 323 980 0662
email: abuffington@murakamiscreen.com
web: www.murakamiscreen.com

DON'T BLAME THE STENCIL

Joe Clarke outlines the relevance of shear-rate

If you were to take the photo-micrograph of a circuit trace on the right and show it to the foremost stencil-experts world-wide, each one of them would tell you the raggedy, saw-toothed edges of the image are the result of a poor quality stencil. Some would specify it was due to an inadequate EOM (stencil thickness proud of the mesh) some would blame the R_zS1 (exterior stencil flatness), some would blame the RzS2 [interior stencil flatness] and some would blame all three parameters – but they'd all be absolutely wrong! This ragged edge is not due to any stencil problem, in fact the stencil was the flawlessly consistent MacDermid-Autotype CX capillary film and, in addition, we applied a couple interior coats of compatible emulsion to increase hydraulic pressure and to regulate more precisely the volume of paste transferred. But if it still looks like a stencil problem to you, please read on.

Figure 1: Viscosity (in poise) on the y-axis and shear-rate (in inverse seconds) on the x-axis

SHEAR-RATE – THE BEST VISCOSITY REDUCER

Our illusion begins with a shear thinning ink or paste which is higher viscosity (thicker) at rest on the screen and becomes lower viscosity (thinner) when put under a shearing force. Shearing forces are imposed on pastes when they are shaken, stirred, squeegeed or screened. To cause the paste to flow through the screen mesh it is necessary to reduce its viscosity and then, once the shearing force is removed, the shear-thinning paste begins to return to its original viscosity.

There are two types of shearing forces in effect during the print stroke – shear-stress and shear-rate. Toothpaste tubes and caulking guns produce shear-stress – wherein the fluid is thinned ever so slightly and it is then squeezed out of a relatively narrow orifice. Ink mixers and blenders produce shear-rate – the viscosity is dramatically reduced immediately prior to application.

Of course, the manufacturer can reduce the viscosity of the paste with the addition of core solvents, diluents or a solvent-diluent blend. The downside to 'thinners' is that they ruin the transitional phases critical for a high quality, consistent trace. Thin with solvents and, when the paste is put under shearing forces, thick goes to too thin and non-uniform

Continued over

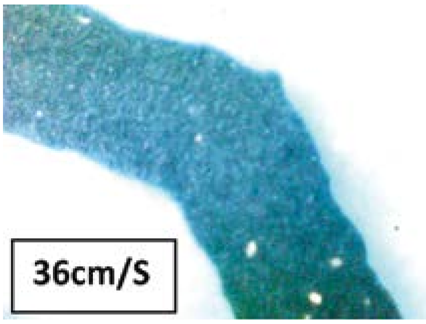


Figure 2: This image was printed at 36cm/S

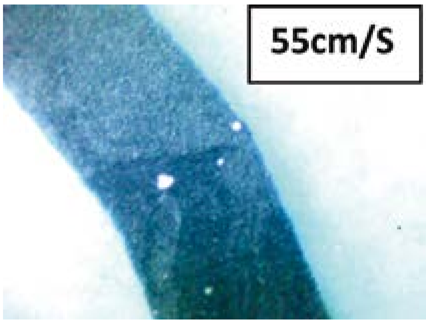


Figure 3: This image was printed at 55cm/S

	Wet Film Deposit DuPont 7102	Ink / Paste Volume	Shearing Force	Edge Acuity
Sefar 105cm/35µ	Defines	Restricts	Secondary	Degrades
CX Capillary Stencil	Increases	Contains	No effect	Defines
CSJ-M75-X10 Blade	Permits flaw-free	Supplies	Primary	Defines

sagging results. Thin with shear-stress and thick goes to just a bit thinner, fails to fill the micro-cavities, and reverts to thick. Thin with shear-rate and the paste becomes sufficiently thin to fill the micro-cavities between mesh and stencil and then it reverts to thick to maintain the precision edge formed by the CX film.

The illustration [Figure 1] lists viscosity (in poise) on the y-axis and shear-rate (in inverse seconds) on the x-axis. (Note that the data in the table is for illustration purposes only and does not depict any particular circuit paste.) The blue diamonds depict the change in viscosity, from thicker to thinner when shear is applied. Zone 1 indicates a high viscosity paste at rest in the screen; it is too thick to transfer through the mesh and onto the substrate. Zone 2 indicates a high viscosity paste which has been 'squeezed' between blade and mesh; it is still too thick to completely fill the micro-cavities between the mesh and the stencil. Zone 3 indicates shear-rate viscosity which, due to high blade speed, has thinned the ink sufficiently to cause it to flow and fill the micro-cavities between the mesh and the stencil wall. Finally Zone 4 indicates infinite shear at which point the flow is no longer shear thinning. The red dashes contain the shear-thinning portion of the paste.

FILLING THE MICRO-CAVITIES

Proper transfer of a shear-thinning paste uses stroke-speed to increase the fluid pressure of the paste which causes the paste to thin and fill the cells of the mesh and the EOM of the stencil to an optimal level. For every mesh and stencil which create the requisite wet film thickness (in microns), there is one and only one volume of paste (in picolitres) to produce the ideal trace. Transfer less volume and resistance increases; transfer more volume and resistance decreases but the spaces between traces diminish, leading to circuit failure.

The table above details the functions of mesh, stencil and blade and their effect on the circuit trace. The mesh defines the wet-film deposit of the paste, but it restricts the volume of paste. It exerts secondary or minor shearing force on the paste and is the facet which degrades edge acuity. We selected CX film to eliminate operator variability. CX film consistently increases the wet film thickness of a fine trace and in addition it contains and limits the paste volume. Stencils do not affect shearing-forces but, along with the high-shear printing blade, they define edge-acuity. By supplying the precise volume of sufficiently low-viscosity paste, the CJS blade along with the CX film creates a flaw-free edge.

The image [Figure 2 and 3] was printed immediately prior to the image at the top using the same screen – mesh and stencil, the same blade and the same ink. The only difference was the shear-rate (annotated in cm/S). The image in Figure 2 was printed at 36cm/S while the image in Figure 3 was printed approximately 50% faster at 55cm/S. The incremental shearing force was sufficient to allow the paste to reach a lower viscosity and then flow into the micro-cavities between the mesh and the uniform wall of the CX capillary film. The blade used was CSJ-M75-X10 – a high-shear/bi-axial blade which was set to 6 degrees, minimum pressure (sufficient to evacuate completely) and speed as indicated.

The dynamic edge of the blade must be fitted to the mesh count and its dynamic tension level while the dynamic profile of the blade must adapt to the transitional phases of the ink. The next time you see ragged edges, before you blame a quality stencil, check to see if you are using a high-shear blade. ■

Joe Clarke is President of Clarke Product Renovation (CPR)

Further information:
Clarke Product Renovation,
Naperville, Illinois, USA
tel: +1 630 352 3229
email: joeclarke@cprknowsjack.com
web: www.cprknowsjack.com

MOVES AND OPPORTUNITIES FOR THE YEAR AHEAD

Tony Cox gives his view on digital market trends

Tony Cox

Yellow ink from Sun Chemical

We have witnessed a continued growth in the number of printer installations sold in 2012 and predict this will continue in 2013. During the last 20 years the wide-format graphics market has seen the biggest shift from conventional analogue technology towards digital technology. Solvent printers will continue to dominate the installed base. However, in the superwide-format segment we have seen most of the major Western (Western Europe and North America) equipment manufacturers eliminating solvent-based printers from their product range and replacing them with either UV-curable or water-based technology. As a result the Chinese equipment manufacturers now dominate the solvent-based superwide-format equipment market and solvent remains the technology of choice for many printers in China, South America and Eastern Europe.

There is also a move towards water-based and UV-curable printers in the wide format sector but most of the established equipment manufacturers continue to offer eco-solvent printers in addition to UV-curable and water-based printers. We see a large number of new eco-solvent based printer installations in the wide-format market and I believe this trend will continue in 2013.

Sun Chemical is planning to launch new products for the wide-format sector

SOFT SIGNAGE TRENDS

The graphics market has also seen a trend towards the use of textile soft signage as an alternative to vinyl or banner materials. The need to replace PVC with other display materials, which are seen as having less of a detrimental effect on the environment, has driven the surge in popularity of textile soft signage. Many major brands are choosing to replace the traditional rigid display materials with more tactile textile materials to stand out from the crowd. I imagine that this theme for exhibition and other promotional displays will carry on well into 2013. Dispersed dye ink technology is most commonly used for printing polyester soft signage materials and printing directly onto the fabric is very popular for this application as a result.

In addition to the continued growth in wide- and superwide-formats, the display graphics market has also seen significant growth of digital in many new market areas. Narrow web and label opportunities have increased as digital press capabilities are being realised. Imprinting and personalised print applications have grown in all geographies and we have seen the introduction of digital printing equipment designed for commercial print publication markets and even for printing newspapers using aqueous ink technology. The versatility of digital printing is also being used in many industrial markets like ceramics, electronics, furniture manufacture and many more.

Variable data markets in China, for instance, are seeing tremendous growth in digital due to the need for supply chain traceability. In terms of future opportunities, packaging applications and commercial print markets present significant opportunities in ink technology. Both of these areas require UV-curable and aqueous inks depending on the end applications and maybe even hybrids of the two in some cases.

Sun Chemical is planning to launch new products within the wide-format sector to complement our growing Streamline range of solvent-based inks for wide-format and superwide-format applications. The new products have been specifically formulated to have the same colour gamut and have the same physical properties as the original products. This enables our customers to convert their equipment to Sun Chemical products with the minimum of risk and without the need to undergo a lengthy conversion process or the need to create new colour profiles. The official launch will take place on Sun Chemical's stand at Fespa 2013. ■

Tony Cox is Business Manager for Digital Aftermarket at Sun Chemical

Further information:
Sun Chemical, Orpington, Kent, UK
tel: + 44 1689 894000
email: packaging@sunchemical.com
web: www.sunchemical.com

HOT TECHNOLOGY. COOL CURE.

DISCOVER L.E.D. SUPERWIDE UV PRINTING.

Introducing the EFI VUTEk GS3250LX.

Reduce cost of ownership and increase productivity with EFI's LED UV-curing superwide printer.

The new EFI™ VUTEk® GS3250LX helps you drive down operating costs with decreased power consumption and no bulb replacements, thanks to EFI LED "cool cure" technology. Its continuous board feature increases board-to-board speeds for faster and more efficient job production. With no VOCs, less consumables and waste, and the ability to print on recycled and thinner, less expensive materials, the VUTEk GS3250LX helps you go green while increasing your application range for more high-volume, high-margin jobs.

And with EFI integrated digital inkjet workflow solutions from job acquisition to production – and industry-leading inks and service – you're always ready to print to win.

Scan or visit www.efi.com/LED10 to see the hot benefits of cool LED. Or call +44 1246 98012 for more information.

efi® print to win.

COMING UP WITH THE NEXT GREAT THING

Riley Hopkins explores the bottom line of daring to be weird

We all would like to be that person who comes up with that brand new thing that creates great success, and makes lots of money. But how do we do it?

Fortunately, if you print manually, you can try out a new idea for less than $200. Since T-shirts are plentiful, and screens are easily burned for new images, it's relatively easy to use that blank canvas to try something new. As a cartoonist and artist, I cannot leave 'anything' alone. I 'have' to doodle on it. The same goes with screen-printing apparel; it is crying out to have something put on it.

So, with that in mind, why not spend a little time trying out new sayings, jokes, political statements, anything, something catchy – for example 'eat the rich' or some rot like that. It doesn't cost much to try out a one colour print (white on black, black on white) run it up a flag-pole, and see who salutes.

Okay, how can you and where can you get some mileage out of your idea? Facebook? YouTube? eBay? a full page colour in The Times newspaper? Obviously getting the most coverage and exposure for the market you are aiming at, with the least amount of money to outlay, is the key. Therefore everything is fair game from the local bar, on up. Getting a local news story about you doesn't hurt. Crazy video has a chance of going viral; (look at the Korean dance video guy) so don't kick anything out of bed. Don't be shy, always try, Give someone a chance to say "yes" to you.

A banner used during the Nike Boom campaign for a promotional event

SAY IT, PRINT IT, WEAR IT

The only reason the latest fashion trend is in the market area it is trendy in, is because somebody had the guts to say it, print it, and wear it. And be ready to make a sled-load of them if they take off. (Knowing someone who has an automatic or two around, to print for you, makes the ability to meet demand a lot easier than trying to print 20,000 shirts by hand, in two days, on a one colour bench press).

So where do special effects, weird ink, odd clothing and bizarre wall hangings come into play? The answer is anywhere you are brave enough to try it out – e-mail Ed Branigan over at International Coatings if you want 'weird'. He is just one out of a number of ink guys that can give you some very effective special effects, with a variety of inks, substrates, and under-the-garment surface preparations. These techniques are often off the Richter scale when it comes to how they turn out.

Being willing to be a little nuts at the right time, and horse around with techniques to see outcomes (and keeping a record of each thing you do, so you can duplicate it in mass if it is successful), will give you a chance to offer people a chance to vote with their pocket book on your design ideas.

The advice of keeping a record of each experiment is imperative.

ACCURATE DUPLICATION

You cannot just walk into a big store, with a big order, and say: "Make it sort of like this". You have to be able to duplicate your work accurately, and consistently, regardless of scale. Most of all keep trying! I have invented quite a few things (more than 20 major design items in machinery and process) and have been wildly optimistic at their potential success; and in reality, only a couple items made the grade.

That doesn't sound much on the surface, but it is a ten percent success rate that, in

Commercial photographer, Tyler Ashlock of Swanson Studio, shooting a ball-bearing through screen-printed glass

This Nike Boom T-shirt was the result of the combined efforts of the screen-printed glass and the photo-shoot

Another example of the Nike Boom campaign on a stadium graphic

actual fact, generated several millions of dollars worth of business.

Without in any way contradicting my above advice, ideas, and suggestions, here is an example of how a good customer and friend of mine, Mr Ryan Moor of the Ryonet Corporation, came up with a new perspective.

Having started exactly like I described above in his back bedroom printing T-dhirts for his band, Mr Moor then progressed and went down the following business path.

Ryonet does not screen-print for profit, meaning that we don't print jobs for customers. Instead, we educate, we supply and support customers who are screen-printers. So how did Ryonet end up 'printing' a job for a large scale advertising campaign involving an international ad agency, a commercial design house, a high-end photography studio and one of the most recognisable brands featuring various high profile athletes, all with a profit of twenty five dollars to thirty dollars/print?

It was simple – by being open minded and flexible. By stepping outside the world of T-shirts, Ryonet had the opportunity to screen-print the core piece of a national advertising campaign that encompassed graphic screen-printing, digital photography, digital printing and, eventually, textile screen-printing.

Be ready and willing to learn, experiment and invest and you, too, can open the door to new markets while increasing print piece margins by more than ten-fold – and maybe even print for Nike.

The bottom line is dare to be weird. Open your mind up to listen for interesting comments from people at work, at the bar, from the news, television, radio, internet and so on. Look at graffiti (interesting all over print perhaps). The seeds of an idea are often mentioned by someone somewhere, and all it takes is for you to process it in a different way and turn it into something potentially saleable. Often it pays quite well, and it is often where the next great thing comes from.

Most of all have some fun, do some new things and make some money. ■

Riley Hopkins is President of Riley Hopkins Screen Printing Machinery

Further information:

Riley Hopkins Screen Printing Machinery,
Gig Harbor, Washington, USA
tel: +1 253 851 9078
email: info@rileyhopkins.com
web: www.rileyhopkins.com

Ryonet Corporation, Vancouver, Washington, USA
tel: +1 360 576 7188
email: rmoor@ryonet.com/hashlock@ryonet.com
web: www.silkscreeningsupplies.com

THE BENEFITS OF UV LED

Mike Horsten presents the advantages of LED curing in ink-jet devices

The usage of UV-cured ink for coating started in the 1960s as a wood coating material. Since the 1990s, it has begun being fully utilised as coating primarily for building materials. In most cases, it has been used as a clear coating material for surface protection.

Because UV-cured ink has several environmentally feasible qualities such as quick drying, film performance, and no emission of volatile organic compounds (VOCs), it has also started being utilised as a printing ink, again since the 1990s.

The UV-cured ink-jet printer, which is the topic of this article, is a relatively new technology that started being utilised since 2001. Because the ink dries quickly and the printer is capable of printing on a variety of media, it is expanding its applications primarily for industrial use.

In the past, metal-halide (MH) lamps have been generally utilised as the curing method for the ink with the UV ink-jet printer. However, the metal halide lamp has several problems such as large calorific value, a short lifespan of 500 to 1,000 hours, the difficulty of turning the UV light on or off, and control of its luminous energy.

Therefore, in 2006, we started the product development of a LED UV-cured ink-jet printer, in which LED (that emits UV light. In 2008 at Drupa, we announced the launch of the LED UV-cured ink-jet printer. This was the UJV-160, the first of its kind in the world. Furthermore, in 2009, we also commercialised a large flat-bed type LED UV-cured ink-jet printer, the JFX-1631.

Additionally, in 2010, we started the production of the UJF-6042, which is compact, inexpensive, and energy conserving. The beneficial characteristics of the LED UV-curing technology proved to be significantly superior to the metal halide lamp technology used in the past. Currently, this printer is the most materialised ink-jet printer showing all the benefits of using UV LED as the curing method.

In this article, the primary technological advancements that were developed for the commercialisation of the LED UV ink-jet printers and that led to the development of UJF-3042 will be introduced. In addition, the rapidly expanding application of this technology in this field and the future outlook of this technology will be explained.

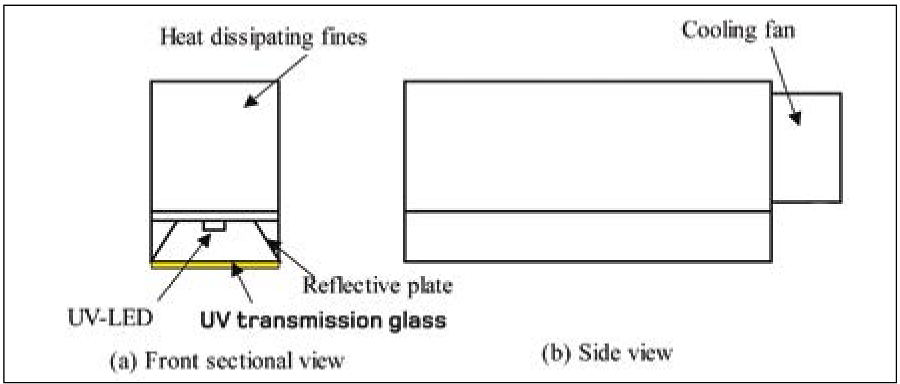


Figure 1: composition of the UV LED Unit

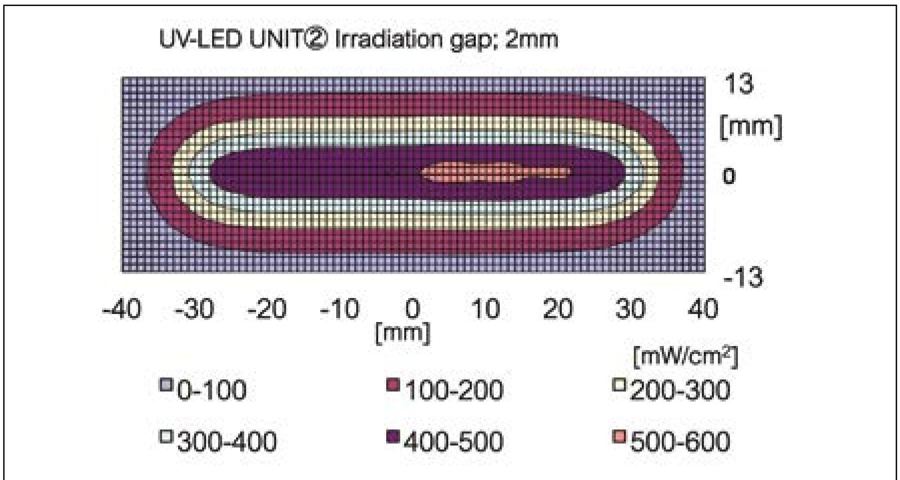


Figure 2: the distribution of the irradiation light intensity at a position of 2mm from the UV LED unit.

ADVANTAGES OF UV INK-JET PRINTERS

The following advantages of the UV ink-jet printer have contributed to its popularity:

1. EXCELLENT MEDIA COMPATIBILITY

The UV ink jet printer is capable of printing directly on various media such as plastic, metal or glass without forming any image-receiving layers.

2. FUNCTIONAL DISSOCIATION-TYPE INK

The ink remains as a UV monomer so the viscosity stays low and the discharging performance is stable inside the printer head. On the other hand, on the printed media, the ink's viscosity immediately goes up and the ink gets solidified by UV photo irradiation. Thus, the printer can directly and clearly print on the media without any image receiving layers. From this, it can be said that this ink is highly capable of functional dissociation that can satisfy the demands of the low viscosity required for the discharge inside the printer head as well as the high viscosity required to avoid blurring once the ink gets on the media, by controlling UV photo irradiation.

3. FORMATION OF STRONG HIGH POLYMER FILM

For aqueous- or solvent-based ink, in order to secure the solubility of resins with a solvent and to avoid discharge barrier due to non-Newtonian fluidisation and large high polymers' entanglement, the resin with a relatively small molecular weight of less than 10,000 is normally utilised as the binder resin. Also, the fixation of those types of ink is usually conducted by just drying and it does not involve any polymerisation reactions. For this reason, the ink directly pertains to the characteristic of the added resin with low molecular weight, and the printed matter owes the flaws, such as water solubility, of low molecule resin and solvent solubility.

On the contrary, inside this printer head, the ink remains as a low-viscosity monomer with low molecular weight that is capable of stable discharge. However, once the ink gets on the media, it starts a polymerisation reaction through UV irradiation and stops blurring by increasing the viscosity. After the ink is completely cured, this printer is characteristically capable of forming strong high polymer films with high molecular weight.

Also, depending on the selection of the polymerised monomer, it would be possible to form films with various characteristics in softness, quality, and adhesion and release properties.

4. LAYERED PRINTING

Once the ink is UV cured, there would be no possibility of blurring and re-dissolution. Therefore, the UV ink can be reprinted on multiple layers for stacked printing or Braille printing. Additionally, by printing a layer of white ink or clear ink, this printer is capable of producing glossy prints such as the backing layer or varnished layers for reflection image observation on transparent media.

5. USER- AND ENVIRONMENTALLY-FRIENDLY

Because the ink does not contain any volatile solvents, it eliminates the issues involving environmental adaptability against VOC restrictions or health damage to the operators due to vapour inhalation.

However, it still requires some caution with the low odour that might occur during the curing process with a photo-curing initiator or the possible onset of allergies by directly contacting unreacted monomer prior to UV curing.

Especially, the characteristic mentioned above is important for ink-jet printers for industrial use that require the feasibility of printing on various types of media.

By taking advantage of the above characteristics of the UV printers using UV cured ink, we launched a LED UV-cured ink jet printer into the market, in which UV LED is used for the curing illuminant instead of the traditional metal halide lamp.

In the following section, the primary development steps that led to the commercialisation of the LED UV-cured ink-jet printer will be explained. Also, findings on the case study of the UJF-3042 being utilised for various printing applications in the digital industry will be examined, and the future perspective of this machine, where the goal of down-sizing and price reduction was achieved, will be reported.

DEVELOPMENT OF THE UV LED INK-JET PRINTER

1. BACKGROUND OF THE INVENTION

It was around the end of year 2003 when we came up with the idea of the UV LED usage. At that time, the development of high power UV LED had just started, so its UV output was still small. The price was about 500,000 yen/1W of UV output. Furthermore, since the radical polymerisation-type ink would often incur curing errors due to oxygen obstruction while being slowly cured under weak UV light, at that time it was considered that weak lights, such as UV LEDs, would not be suitable for curing ink.

The commercialisation of the UV LED printer is supported by the following two primary technologies developed afterwards. One is the development of a high-output UV LED unit. The other is the development of high-sensitivity ink for UV LED.

As for the development of a high-output UV LED, the maximum output/chip at the beginning of the development was only a few mW to a few dozen mW. The output is presently increased to dozens of W or more even under air-cooled conditions with the UV LED module, where several chips are installed. Thus, it became possible to instantly cure UV ink.

Regarding the development of high-sensitivity ink, if a traditional UV-cured ink that was cured by a metal halide lamp is used for UV LED curing, the required light energy for a complete cure would be several thousand mJ/cm^2 or more, which is not practical for commercialisation. This is because the absorption wavelength of the UV ink made for metal halide lamp is not matched up with the luminous wavelength of UV LED.

With the newly developed UV cured ink for UV LED, it became possible to cure the ink completely by using only about 100 to 300mJ/cm^2 of UV LED light energy

Since the two major technological solutions given above were obtained, the product development of the LED UV-cured ink jet printer UJV-160 commenced in 2006.

Furthermore, the cost issue that was of concern at the beginning of the development was resolved by the innovation of mass-production technology in later years. As seen in the UJF-3042, the technology developed is superior to the metal halide lamp technology now being able to reduce its cost.

2. UV LED UNIT

Figure 1 shows the structural drawing of the UV LED unit adopted for the UJV-160; (a) is

Continued over

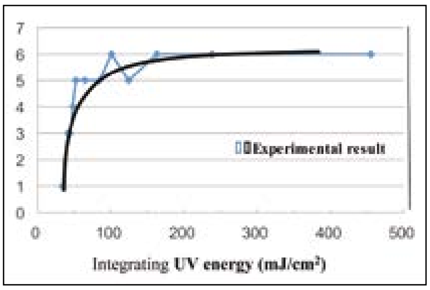


Figure 3: the hardening sensitivity characteristic of the high sensitivity ink for UV LED

the printer's front cross sectional view, (b) is the side view, and there is a cooling fan attached to one side of the unit.

Figure 2 indicates the distribution of the UV light intensity at a position two mm directly below the UV LED unit. As seen in the distribution, irradiation intensity of over 300-400mW/cm^2 was obtained in a slit of about 60x10mm. The width covers the ink jet head, which is about two inches.

3. HIGH-SENSITIVITY INK FOR UV LED USE

The traditional UV-cured ink was designed to be cured efficiently under UV light with short wavelengths of less than 350nm suited for metal halide lamps. When the generic UV ink was cured under UV LED with longer wavelengths of 365 to 400nm, more than several thousand mJ/cm^2 of energy was required because the UV ink could not effectively absorb the UV LED light.

Figure 3 shows the hardening sensitivity characteristics of high-sensitivity ink for UV LED, which is a newly developed radical polymerization-type ink.

The hardening sensitivity was evaluated by a pencil hardness test. From the result, it was found that the ink could be completely cured by the UV LED light energy of about 150m J/cm^2. The emission wavelength was 380nm. A sensitiser with about 350-390nm absorption capability was added to the ink.

It is known that the following relationship exists between radical polymerisation's reaction velocity V and irradiation light intensity I 3)

$$V \propto I^{1/2} \quad (1)$$

Figure 4 shows the amount of UV energy necessary for a complete cure, depending on various UV-LED light intensity I.

The result shows the characteristic of a typical radical polymerisation-type ink. Namely, as the UV light intensity I increases according to I to the power of -1/2, the UV energy Eh required for the cure goes down and the sensitivity goes up. Since UV LED, which has strong directivity, can easily concentrate lights, radical polymerisation-type ink that has characteristics similar to what is shown in Fig.4 is suitable for the high-speed cure by UV LED, which has excellent light-harvesting capability. The ink utilised for the measurement is LH-100.

Furthermore, a UV LED with wavelengths that enable less absorption by pigments added to the ink was chosen in order to obtain high-sensitivity and sufficiently cure not only the surface but also the inside.

As seen from Fig. 3, it was found that the LED UV-cured ink developed under the above concepts could be completely cured through UV LED photo irradiation with about 150mJ/cm^2 of integrating light energy.

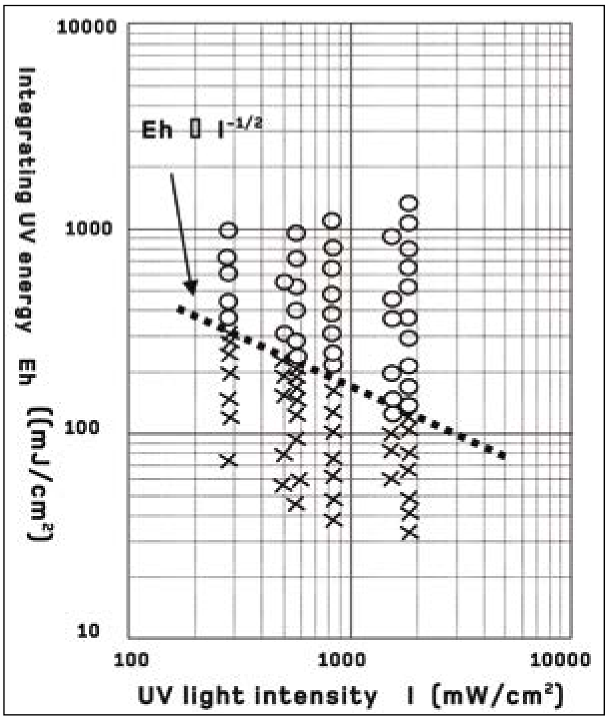


Figure 4: the relationship between UV energy required for curing and UV light intensity.

STRUCTURE AND ADVANTAGES OF LED UV INK-JET PRINTER

1. STRUCTURE OF UV LED PRINTER

Figure 5 shows the basic structure of a UV ink-jet printer. In order to be able to do duplex printing, a UV LED irradiation unit is placed on each side of the ink-jet head, which slides sideways along the Y-axis. The media are transported in the direction of X-axis.

Also, for simplex printing, a UV LED irradiation unit should be placed only at the lower reach in the moving direction of the ink-jet head.

2. ADVANTAGES OF UV LED PRINTERS

Compared to the traditional UV ink-jet printers using

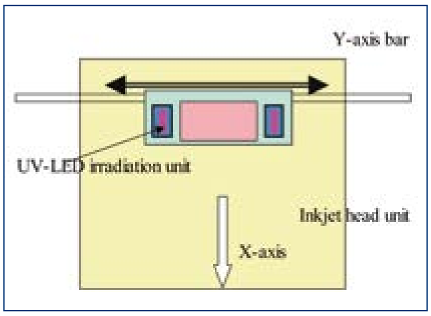


Figure 5: arrangement of ink-jet print head and UV LED irradiation units in the UV LED ink-jet printer.

metal halide lamps, LED-UV printers have the following advantages.

i. Low power consumption

The UV LED unit in Fig. 1 consumes about 60W of electricity solely for the UV LED of the module. It also consumes approximately additional 20W for the cooling fan and the output control circuit, etc. Thus, the total power dissipation by the UV LED unit is about 80W and the total emission of UV light energy from the unit is about 10W.

Meanwhile, the total power consumption of the traditional metal halide lamp is about 1.2kW/lamp. Solely comparing the exposure system, the power consumption of the metal halide lamp is about 15 times as much as the UV LED curing system.

In addition, because UV LED is capable of instant lighting and lights instantly turn off, serial ink-jet printers which have hosts coupled to a ink-jet head can control the switch to limit the irradiation only during the actual printing time and at the printing spot. On the other hand, once it's turned off, a metal halide lamp cannot be turned on again until the lamp cools down. Thus, it is generally used with constant lighting. For the above reason, the difference of the actual power consumption between a UV LED and a metal halide lamp gets even bigger. At 50% operation rate, solely comparing the exposure system, a metal halide lamp on average consumes more than 30 times as much electricity as UV LED. Furthermore, during continuous printing, there is a non-printing over-run area at both sides of the ink-jet printer to slow down and re-accelerate after reversing the printing direction. Because UV LED printers can immediately turn off the UV LED once it passes the printing area, the difference of the power consumption would be further enlarged.

In reality, due to the common elements such as media transportation motor, electric circuit, and the ink supply system, the actual difference of power consumption of the entire printer would be a little bit smaller. Comparing both types of printers that operate at an identical speed, the printer with a metal halide lamp consumes three to ten times as much electricity as the one with UV LED.

ii. Miniaturisation

Since a metal halide lamp consumes a lot of energy, it needs a powerful cooling fan or cooling fin to emit the heat. For that reason, the lamp house has to be big.

Also, the lighting power source has to have high capacity, which automatically makes it larger. In addition, because UV LED does not have UV lights with a short wavelength, no ozone would be generated, so light ventilation would be enough to eliminate the odour during the ink cure. Thus, the ventilation system can be down-sized. From the above, using UV LED as the light source for curing, the overall size of the printer can be smaller compared to the printer using a metal halide lamp.

iii. Long service life

The lamp life of a metal halide lamp is normally considered to be about 1,000 hours if measured up to the time of 30% light reduction. For instance, with a 1,000 hours service life, if the lamp operates for eight hours a day, it will have to be replaced in 125 days (about six months with 20 operational days/month).

Meanwhile, although UV LED depends on the heat dissipation condition, the service life of a single chip with UV LED is about 10,000 to 15,000 hours. If UV LED operates for eight hours a day, with 10,000 hours service life, it lasts for 1,250 days (about five years with 250 operational days/year). Furthermore, since UV LED is turned off in non-printing mode during the uptime, the actual service life would be longer. Therefore, printers using UV LED practically need no lamp replacement.

iv. Freely adjustable light volume

Inside the discharge tube of a metal halide lamp, the current value must be kept over a fixed value in order to maintain the discharge. Thus, the lamp itself does not allow too much dimmer control.

In reality, however, depending on the printing mode, more than two to four times of speed difference would easily happen to the ink-jet printer. Therefore, some sort of dimmer control would be necessary to maintain a constant cure regardless of the printing mode.

With UV LED, the light volume can be constantly controlled between zero and the maximum rated output by the amount of current or luminous pulse width. Thus, it has the advantage of being able to set the optimal light volume for irradiation depending on the printing mode.

v. No overheating of media

With the traditional metal halide lamp, the glass surface of the lamp gets extremely hot. Furthermore, not only UV light but also excessive visible light, infrared light and far-infrared radiation are emitted and overheat the media.

With UV LED, the temperature of the UV LED chip itself barely goes up. In addition, only UV light that has its peak at 365 to 390nm is emitted. Thus, the media would not be overheated. Due to the above, printers using UV LED have the advantage of being able to print on media that is vulnerable to heat.

vi. Ozone-free

UV LED does not contain any UV lights with the wavelength components of less than 280nm that belong to UV-C, which cause ozone generation. Therefore, UV LED does not generate ozone. For that reason, there is no need to arrange special ventilation to eliminate ozone. ■

Mike Horsten, Marketing Manager EMEA at Mimaki Europe, in cooperation with Mimaki Engineering Japan / R&D department

Further information:
Mimaki Europe, Diemen, The Netherlands
tel: +31 643068526
email: M.horsten@mimakieurope.com
web: Mimakieurope.com

MAKING THE TRANSITION FROM GRAPHICS TO ELECTRONICS

Ryan Banfield explains the basics of working with conductive inks

Printed electronics is a large and fast growing industry driven by much new research and development into new applications. With a bit of training, it is possible for any graphic ink printer to print the functional inks required in these new applications. Learning about and printing conductive inks (or functional inks) for printed electronics' applications is very much the same idea and this article aims to provide an introduction to companies looking to get into the printed electronics' market or learn a few things about the basics of the materials they use day in and out for current printed electronics' jobs.

A conductive ink can be summarised as a medium to low viscosity thermoplastic paste designed to conduct electricity from point A to point B. The ink is comprised of usually three, sometimes four parts. The binder holds everything together and provides the backbone to the product. The conductor is the functional part of the ink and allows the electricity a path to flow through, the solvent puts the ink into a solution and determines drying/working conditions of the material, and optionally, the surfactants, or the add-ins for the material makes it more compatible with the printing process and substrates.

Often, in a traditional conductive material, the conductor is silver based. Silver is chosen because of its unique properties, despite the higher cost. In order to explain this, we can compare copper to silver. Picture an exposed copper rod with no protective coating on it. That copper wire is very conductive and will be for its lifetime, as it's a pure metal. Over time, the exterior of the wire will begin to change colour and go through a chemical reaction as it's exposed to oxygen and turn into copper oxide. Copper oxide is extremely nonconductive, but since the core of the wire remains solid copper, the wire still conducts extremely well.

Now, take the same copper wire (before oxidising) and cut it up into a million tiny pieces. Take those millions of tiny pieces and suspend them in a non-conductive polymer and do the same with a silver. Take these new materials and print these ink traces side by side. In measuring conductivity, one will notice that they are extremely similar in numbers, however, over time these materials, even if covered and protected, will eventually start to oxidise. In the case of copper, this now means that the electricity must travel across one particle (highly conductive) through the oxide layer (non-conductive) through the polymer (non-conductive) through another oxide layer (non-conductive) just to get back to the highly conductive layer of the next particle. Silver oxide layers, as well as gold and platinum, are still highly conductive, so inks made from these particles remain highly conductive even after the metal powders oxidise on their surfaces.

The shape of the conductive silver particle contributes to electrical properties; making those particles is a very precise science. To start, silver bullion is shredded and dissolved in nitric acid to form silver nitrate, which then goes through an electro-chemical process to force the silver metal to drop out of solution in precisely shaped and sized spheres. If an ink was made out of these round spheres as is, the silver particles suspended in the ink solution will then only make contact at one point where the spheres touch, which does not positively promote the travel of electricity through the trace (see Figure 1), so the spheres are treated with a further step. Once the spheres are deposited, they are collected and measured for consistency and then placed into a grinding mill (attritor, ball media, etc), covered in a fatty acid such as stearic and oleic acid. The fatty acid behaves as a lubricant and allows the spheres to be carefully flattened into thin flakes. These flakes, when printed as an ink, lay face to face touching across a larger surface area than the spherical silver could; therefore they decrease the resistance of the ink while using the same volume of silver as the spheres (Figure 2).

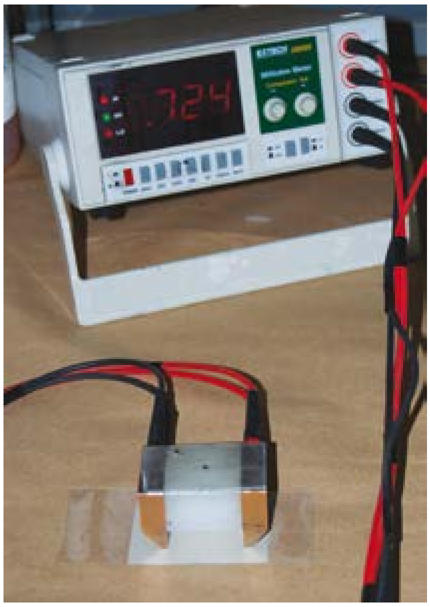


Figure 3: The box electrode is a standard tool that is cheap to make for testing finished inks in order to meet ASTM F 1896-98's test procedure

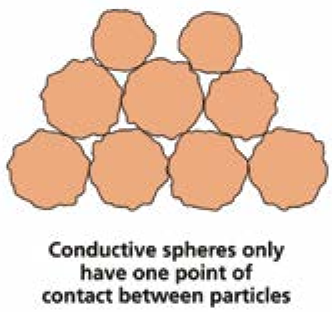


Figure 1: a particle of silver in a sphere shape contacts the adjacent particle in one point only, limiting the flow of electricity and increasing the resistance of the ink

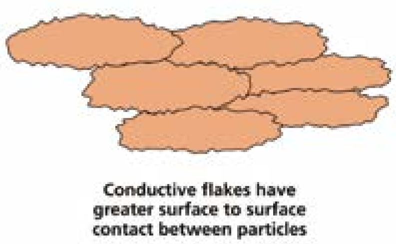


Figure 2: when silver is in a flake form, more of its surface area can come in contact with the adjacent particle allowing electricity to flow more readily

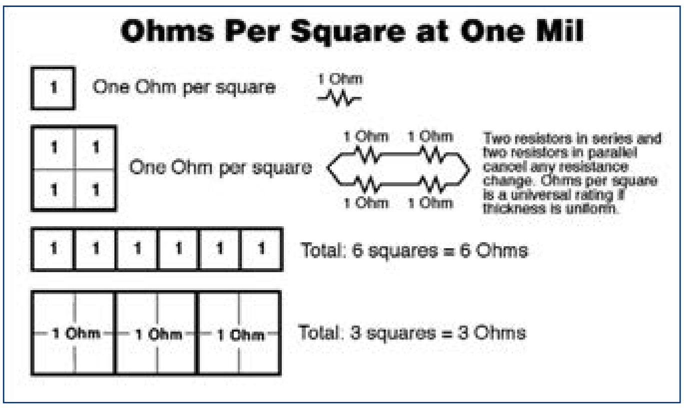


Figure 4: describing the measurement of ohms/sq/mil seen on a conductive inks data sheet and how it translates to manufacturing a circuit

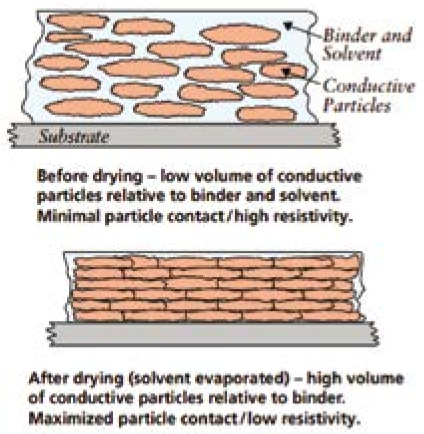


Figure 5: how drying affects the final conductivity of an ink and why completeness of drying is so crucial to a finished part

PARTICLE SIZE DISTRIBUTION

Along with particle shape, there is a ratio known as a particle size distribution that heavily controls the conductivity of the ink. In an ink, you want large particles in order to carry current long distances without having to jump through so many particle to particle junctions, but if you only use the large particles, there will be large spaces where the particles can't pack efficiently. To minimise these gaps, a distribution of large and small particles is used in order to optimise the flow of electricity. One thing to keep in mind when selecting an ink is that if you plan on doing an application where Ph levels might affect your completed circuit (often times seen in the medical diagnostic field), fatty acid coatings on silver may have an adverse effect on your completed part.

While silver is the principal conductor used in functional inks, there are other low cost solutions. Carbon is often used in place of silver when high conductivity is not needed, or the two can be blended together to reach an intermittent electrical resistance value. The trade off is that carbon is notoriously difficult to work with and electrical resistance changes are higher than in a silver ink. Electrical resistance will drift over the course of the production run. If you don't accommodate this drift in your process set-up over the course of a long press run, you'll find yourself scrapping parts after they've been processed in the final QC stage.

One of the main causes of ink failure on press is solvent selection. Solvent choices and availability are translated relatively cleanly from graphics to conductive ink printing. The ink manufacturer will provide solvents that provide the best balance between on screen working time and minimising drying time and temperature in the oven. Keep in mind that if you request a solvent change from your supplier in order to decrease drying time in the oven, but increase working time on the press, you're asking for something that is not feasible.

Drying time in the oven and working time on press work against each other. The best way to decrease your drying time while maintaining working time is to increase oven temperature or decrease belt speed. Keep in mind, the only purpose of the solvent is to turn the binder into a liquid form so it can be passed through the screen and nothing else. It is important to keep a watchful eye on an ink the first time you run it to make sure there are no solvent incompatibilities with your substrate or other surfaces that the ink will come in contact with that will create problems like mud cracking or de-wetting, a problem seen by most printers that have ever worked with polycarbonate substrates.

PRODUCT FUNCTIONALITY

Once an ink has been established that meets all the requirements for properties like viscosity and thixotropic index, you need to start looking at the functionality of the product as a whole as well, and that requires looking at resistance numbers. The industry standard for measuring electrical conductivity in a printed circuit is surface resistance, a test method made popular by the rubber industry many years ago.

The unit of measurement on ink data sheets is ohms/square and measured at one

Continued over

mil (.001 inch, or approximately 25 microns) thick using a device called a box electrode. The box electrode is two conductors that are a distance of a certain measure long and spaced by a non-conductive spacer that's that same unit of measure wide (Figure 3). This distance can be one centimetre long spaced one centimetre wide or it can be ten centimetres long by ten centimetres wide; it does not matter, so long as the electrode forms a perfect square.

The resistance measurement is taken from these two conductors placed on top of a wide trace, big enough to cover the area of the box electrode. One of the probes acts as the anode and the other the cathode. Since they are the same unit in length and width, the actual length units cancel itself out, giving the unit a reading of ohms (resistance)/square (unit of measure)/mil or, on paper, Ω/☐/mil. This becomes key when selecting an ink for your application.

Let's say your customer has specified that they want a resistance of less than 100 ohms on their longest trace (a standard number) that is 50 centimetres long by .5 centimetres wide. If we go back to the ohms/square example before and work it backwards, we can find out what the resistance of the ink needs to be. If I dictate that the square in ohms/square is .5 cm long and .5 cm wide, then I know that I can fit 100 squares into that trace. In order to meet the customer requirement, each of those squares has to be one ohm or less in order to have a reading of 100 ohms point to point assuming a 25 micron thickness.

SIMPLE ALGEBRAIC FORMULA

The following formula can be used to calculate this as well using simple algebra. The legend is as follows: TRCL is the total length of the trace, TRCW is the width of the trace, TRCT is the thickness of the trace, INKΩ/SQ is the resistance of the ink normalized out to 1 mil and finally, ΩT is the total resistance of the trace point to point.

$$\left(\left(\frac{TRC_L}{TRC_W}\right)[(TRC]_T)\right) INK_{\frac{\Omega}{SQ}} = \Omega_T$$

This is the formula to be using with SAE measurements; if you want to use metric and measure in microns, the trace thickness must be divided by 25 (example: (12 microns thick) / 25 = .48). (Figure 4)

The next hurdle that a printer/designer must overcome is application of the product. Applying a conductive material using screen-printing is extremely similar, to printing graphic inks and won't be a focus of this article other than a few general comments. There are really only two main differences between the tool selection for printing of conductive materials versus graphics; the first is mesh/encapsulant selection. When printing conductive inks, keep in mind thicker is always better to a certain limit. Usually when

SPECIFICATION	DESCRIPTION
ASTM F 1896-98	Test Method For Determining The Electrical Resistivity Of A Printed Conductive Material
ASTM D 4496	DC Resistance Or Conductance Of Moderately Conductive Materials
ASTM D 257	DC Resistance Or Conductance Of Insulating Materials
ASTM D 991	Volume Resistivity Of Electrically Conductive And Antistatic Products
ASTM D 2739 90	Volume Resistivity Of Conductive Adhesives

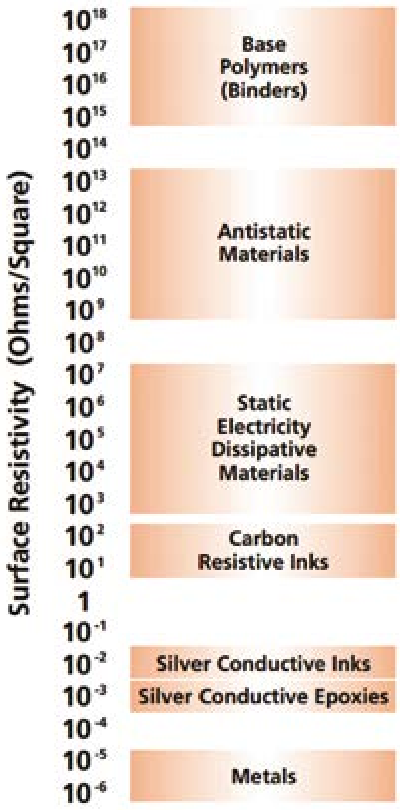
Figure 6: for the ASTM testing specs, listed here are the basics specs used in the printed electronics market

you're printing, you don't want to go much thicker than 40 microns dry film thickness, or about 125 to 150 microns wet, as you will start to observe a phenomena called skinning, especially if using rapid drying methods like IR. This is when the ink is dried on the surface trapping solvents underneath, and can usually lead to decreased conductivity levels, failure in adhesion testing, and in extreme cases, sheets of substrate sticking together. It is generally a good idea to print multiple passes, each with its own drying stage, if a large thickness is needed.

One thing to keep in mind when selecting a mesh is particle size of the silver in the ink. The rule of thumb is that the mesh opening needs to be at least three times larger than the largest particle present in the ink. However, most often printers can easily get away with two times larger than the specified particle size in their ink; they just need to be mindful and watch for clogged holes and pin holes on their prints. Again, this is an option to be discussed with the ink manufacturer.

The other part that is different between printing graphic and conductive ink is the inspection type, and this is the hardest part to teach someone. When printing conductive inks, you don't care about things like colour, hue, or intensity, only point to point resistance. Keep in mind, these printed circuits will probably be covered in a graphic laminate. It's not being implied that you can have contamination and smudges on your circuit, only that silver inks can look extremely different from each other based on particle size, lubricant present on the silver, and type of resin the ink is built around.

When testing inks, expect the shade of the inks to be different. One may be slightly blue, one slightly green, and yet another bright silver in colour. That being said, ink of the same part number should be very consistent in colour from print to print and lot to lot. One



the difference in volume resistivity of different binders and conductive fillers commonly used in functional electronic printing

other characteristic of some silver inks is that they will start to discolour and turn a gold-brown shade over time after printing. This is a cosmetic issue that does not affect ink performance.

DRYING CRITERIA

When looking at drying, keep this in mind. When the ink is exposed to heat, the solvent begins to evaporate and the volume of the ink trace starts to decrease. If you were to measure the resistance of a wet trace of ink, there would be an infinite reading, as the silver particles are spaced too far apart in the given volume of binder and solvent to conduct.

As the solvent evaporates and the ink shrinks and everything starts to pull together, all the silver particles start to pack and lay together making contact with each other and conducting electricity (Figure 5) One of the tests to check for dryness of your material is to take a resistance reading of the trace and then send it down the oven again. Check for resistance readings again and if you get less than a 5 to 10% drop, it can be considered dry after the first oven pass. Anything more and you have to either slow down your conveyor line, increase your oven temperature, or look at a new system with a faster evaporation rate. ASTM has a complete series of test methods for membrane switches and these procedures can be used within other printed electronics products (Figure 6).

Once you have your conductive trace printed out, there are a number of other production processes that you can go through, the most common being a UV curable protective barrier. The purpose of this layer is to protect the silver ink trace from shorting out if it contacts another trace and to provide abrasion resistance. Processing a UV dielectric is similar to your UV graphic inks, but there are some differences.

Typically, it is recommended that when you print a UV protective layer, you print it twice, each layer targeting .75 mils or 18 to 20 microns. When the second layer is printed, a shift in the X and Y direction of a few microns is suggested in case there is a defect in the screen; that way, the defect is covered by the second pass and a pin hole is not placed over a pin hole. In order to dry these protective barriers, the most commonly used system is a mercury vapour lamp with no doping and an output of 750+ mJ/cm at a setting of 300 Watts. Due to the fact that it is almost impossible to create an in-line test to check for completeness of cure in a UV system, more energy is always recommended, in the range of 850 mJ/cm, but again, this is something that has to be discussed with your ink manufacturer.

A standard cross-hatch adhesion test is recommended to check for adhesion to substrate and interlayer adhesion of the products. One thing to keep in mind when printing UV-curable materials on top of a silver is that the low molecular weight monomers of a UV system polymer can act as a solvent that often will eat its way into the silver ink. This means that the silver ink will eventually degrade and increase in resistance the longer that the dielectric sits on the ink uncured.

If you are noticing a slow creep in resistance over time, undercured dielectric can often be indicated as the culprit. One method to improve interlayer adhesion of the two dielectric layers is to slightly under cure the first printed layer by slightly speeding up the conveyor, and then fully curing both layers at normal belt speed after printing the second layer.

LAMINATING THE GRAPHIC LAYER

Another process that is typically done to the completed circuit is lamination of the graphic layer to the completed circuit. This can be a process that causes a large amount of problems if careful consideration is not made. It is highly recommended that the laminate does not come in contact with the actual silver trace, but rather, only the dielectric. This is because if you go through a laminating process, especially one that involves heat, and your laminate is a similar binder system as the silver you're using, the laminate adhesive may start to absorb into the silver ink in the same way that low molecular weight monomer from the UV dielectric will, causing an increase in resistance.

The transition of printing silver functional inks for printed electronics from printing graphics is not that difficult of a step to take, but it must be done recognising that there are some differences involved and a learning curve to understand test methods. This requires looking at the new ink systems, screens for the prints, and a point to point multi meter for the basic applications. Simple markets to approach are things like membrane switch and from there jumping off into the much more technical world of established markets like EL panels and medical electrodes or the R&D world for up and coming products like printed OLEDs and flexible solar cells. The possibilities are limitless with where you can go and it's all using equipment you already have in house.

Printed electronics is a large and fast growing industry worldwide with new applications in touch-screen, OLED and solar cells pushing this growth. ■

Ryan Banfield is Sales Engineer at Conductive Compounds

Further information:
Conductive Compounds Inc,
Hudson, New Hampshire, USA
tel: +1 603 595 6221 x 305
email: ryanb@conductivecompounds.com
web: www.conductivecompounds.com

FINE TUNING VEHICLE DECORATION

Denise Nathan explains how film technology has transformed car personalisation

Wrapping vehicles for fashion is the latest trend in vehicle decoration. Car owners now have the opportunity to personalise the paintwork of their vehicles to suit their own tastes and to create a unique, individual look. Paint finishes that would normally be very expensive in a paint shop or finishes that simply cannot be achieved with paint can now easily be realised with the use of self-adhesive films.

Bright statement colours in matt and gloss, pearl, iridescent, carbon fibre, brushed metal and leather are just some of the finishes available today. The advantage of using a film is also the removability aspect which allows the car to be returned to a standard more saleable colour

The original Mini prior to being wrapped

The profile of customers choosing to wrap their vehicles is varied and not just limited to boy racers. As these films have a high-end finish, owners of expensive car models are also embracing this trend. This opens up new possibilities for sign companies looking for additional business prospects in the market. Car tuning with self-adhesive requires no conversion of the film so the only costs involved are the film itself and application time. This allows for good profit opportunities for experienced applicators.

ATTRACTIVE TO CUSTOMERS

In order for this concept to be attractive to consumers the cost has to be reasonable and the end result visually appealing. Customers will expect any application to have a near paint like finish without any obvious imperfections, be long lasting and the price will need to be at a level more cost effective than painting. To achieve this, the key to success is application skill and working with the right film.

While wrapping vehicles in coloured film is nothing new, films for this type of application need to be different to your run-of-the-mill cast film. While cast films can, of course, be used to wrap an entire car, what is being offered is in fact a paint replacement solution which requires special qualities that are quite different to standard graphic decoration.

MACtac Europe has recognised the market potential of paint replacement films and developed a stunning range of Tuning Films specifically designed for the needs of this particular application.

Larger pieces of MACtac Tuning Film result in fewer joins

LARGER PIECES MEAN FEWER JOINS

The first advantage of Tuning Films is that they come in wider width rolls. Working in larger pieces means fewer joins for a much better end result. Large pieces of film are, however, harder to control and if the film is too thin then you can easily run into problems and your application time will increase trying to manage the film. Tuning Films offer a thicker gauge that provides the right amount of rigidity to make application easier and faster while retaining enough flexibility to conform over convex curves.

Tuning Films are designed to be more robust than standard options. They are there to provide a long term paint replacement solution and need to be durable enough to withstand the rigours of being applied to a moving vehicle that will be exposed to scratches, stone chips, mechanical abrasion, car washes and a variety of environmental conditions. Paint can also be exposed to petrol spillages and salt (in climates with snow) and so a film that can withstand all these conditions is required.

As every inch of the vehicle is wrapped, the film must offer superior durability in horizontal as well as vertical applications. Not all films are warranted for horizontal applications. Tuning Films are manufactured with all this in mind and have extra additives and stabilisers added to ensure the performance of the film in a variety of conditions and regardless of orientation.

EASY APPLICATION PROPERTIES

Tuning Films come with an adhesive system that makes application easier and faster as well as assisting in reducing the appearance of bubbles and wrinkles. This can be in the form of an adhesive with a lower initial tack or special features to allow for repositioning and better control during the initial application stage. Bubble-free adhesives are also offered to allow trapped air to escape and to improve application speed.

The inclusion of extra ingredients, increased film thickness and specialised adhesive systems contributes to an increase in the overall cost of manufacturing. On the face of it, Tuning Films are more expensive than

A special adhesive system makes application easier and faster and reduces the bubbles and wrinkles

standard coloured films; however, what counts is the overall cost of the job rather than simply one component. These features, while more expensive, actually contribute to a lower end cost of the total job and you have a film that will offer the best durability and performance for this kind of application.

Removability is also an important consideration in film selection as the customer could end up paying a significant amount to remove the film if it breaks into thousands of pieces or leaves excessive adhesive residue when it is removed. MACtac Tuning Films has a unique adhesive system that offers fast, easy and clean removability keeping the underlying paintwork intact.


A special adhesive system makes application easier and faster and reduces the bubbles and wrinkles

Tuning Films open up a whole new world of possibilities for customers looking for unique paint finishes and colours. They can also be used on other substrates such as car interiors, laptops, phones or for interior design applications. With the right film choice they are an easy additional offering to any sign company's portfolio and can provide an additional, profitable revenue stream. ■

Denise Nathan is Marketing Manager – Oceania at MACtac

Further information:
MACtac, Soignies, Belgium
tel: +32 67 346 211
email: denise@mactac.co.nz
web: www.mactac.eu

MEETING THE RIGOROUS DEMANDS OF MEDICAL APPLICATIONS

Mark Vasilantone evaluates the importance of specialist equipment

Few quality standards are more stringent than those for a hospital operating suite. Identifying the proper surgical instrument during a procedure promptly and accurately is vital, but equally important is fully accounting for all instruments after a procedure by returning each one to its outlined and labelled spot on a surgical tray. Forming these trays and screen-printing of exacting, durable graphics is the specialty of Medicraft, Inc, a leading developer and manufacturer of custom and standard delivery systems exclusively for the medical industry.

Medicraft manufactures medical delivery systems from aluminium, stainless steel and plastic, and screen prints graphics on the trays. "We mostly print part numbers and descriptions, but also some graphic images, so our clients can account for every instrument on a surgical tray," explains David Seiz, managing art director at Medicraft's Elmwood Park, NJ headquarters.

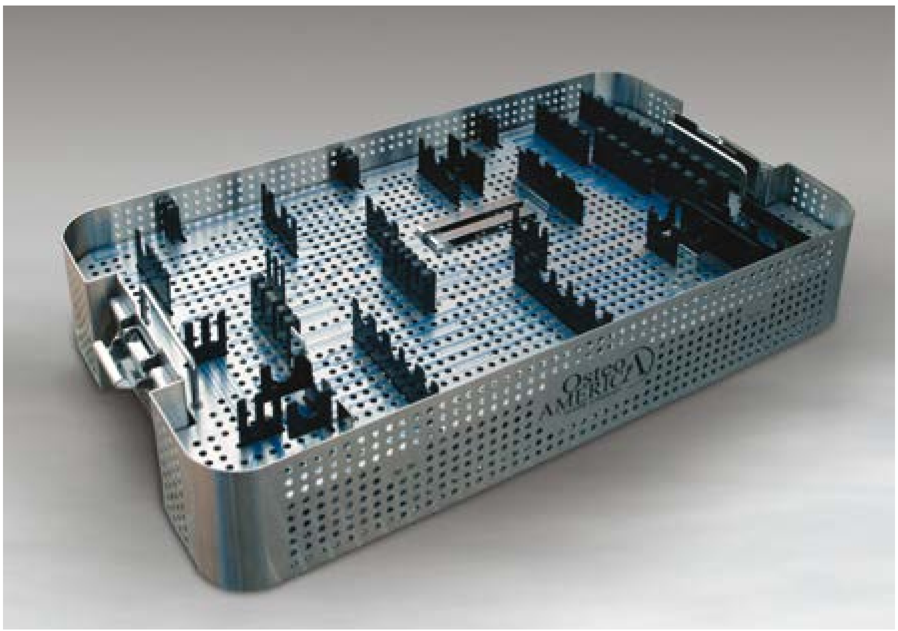
Surgeons require specialised sets of instruments for different procedures, and any given set is often used several times per day. After each use, the trays and the instruments must be sterilised in autoclaves subjected to pressurised steam, placing rigourous demands on the screen-printed graphics.

"Adhesion is extremely important, as is the quality, consistency and legibility of the graphic image," says Seiz, adding: "We have a multi-step quality inspection system in place. Everything must be perfect for the medical industry and meet our ISO requirements." Medicraft is ISO9001 certified and on the path to achieving an ISO13485 certification, a quality standard for those engaged in manufacturing of medical devices.

TAKING SCREEN-PRINTING IN-HOUSE

The company outsourced its screen-printing for many years, but recently established its own screen-printing department to improve its quality assurance process. "We now screen-print about one-third of our trays in-house, and expect that to increase significantly," explains Seiz.

Before making the decision to go in-house, Medicraft conducted extensive research on the types of inks that could be used and investigated several screen-printing equipment manufacturers. Screen-printing has long been the industry standard for printing on instrument delivery systems because of the need to use highly specialised inks that stand up to repeated autoclaving, and due to the varying shapes of the trays. Manual printing is also critical for quality control to catch impression errors at the source.



Medicraft forms surgical trays and screen-prints graphics on them with its Vastex 2000HD heavy duty presses

EVALUATING SCREEN-PRINTING EQUIPMENT

Seiz did a significant amount of research before committing to a system, and first evaluated Vastex equipment at the 2008 SGIA show in Atlanta, Georgia when exploring his options. "When we decided to pull the trigger and go in-house, I visited the Vastex factory in Allentown, Pennsylvania to review details thoroughly with the sales staff and run tests using our trays. We needed to be certain that the screen-printing equipment could accurately print the specialised ink required to meet our quality standard."

Medicraft purchased two Vastex one-colour tabletop 2000HD Heavy Duty Screen Printing Presses and added a Vastex EconoRed 30 Infrared Dryer to cure the ink. The manual presses are constructed with tube steel legs, square steel rotor arms, heavy-gauge steel rotor assemblies and non-warp steel pallets. All critical moving parts, including registration wheel locks, ride on ball bearings. These industrial-grade machines matched Medicraft's requirements for fast set up time, fine registration accuracy and high productivity.

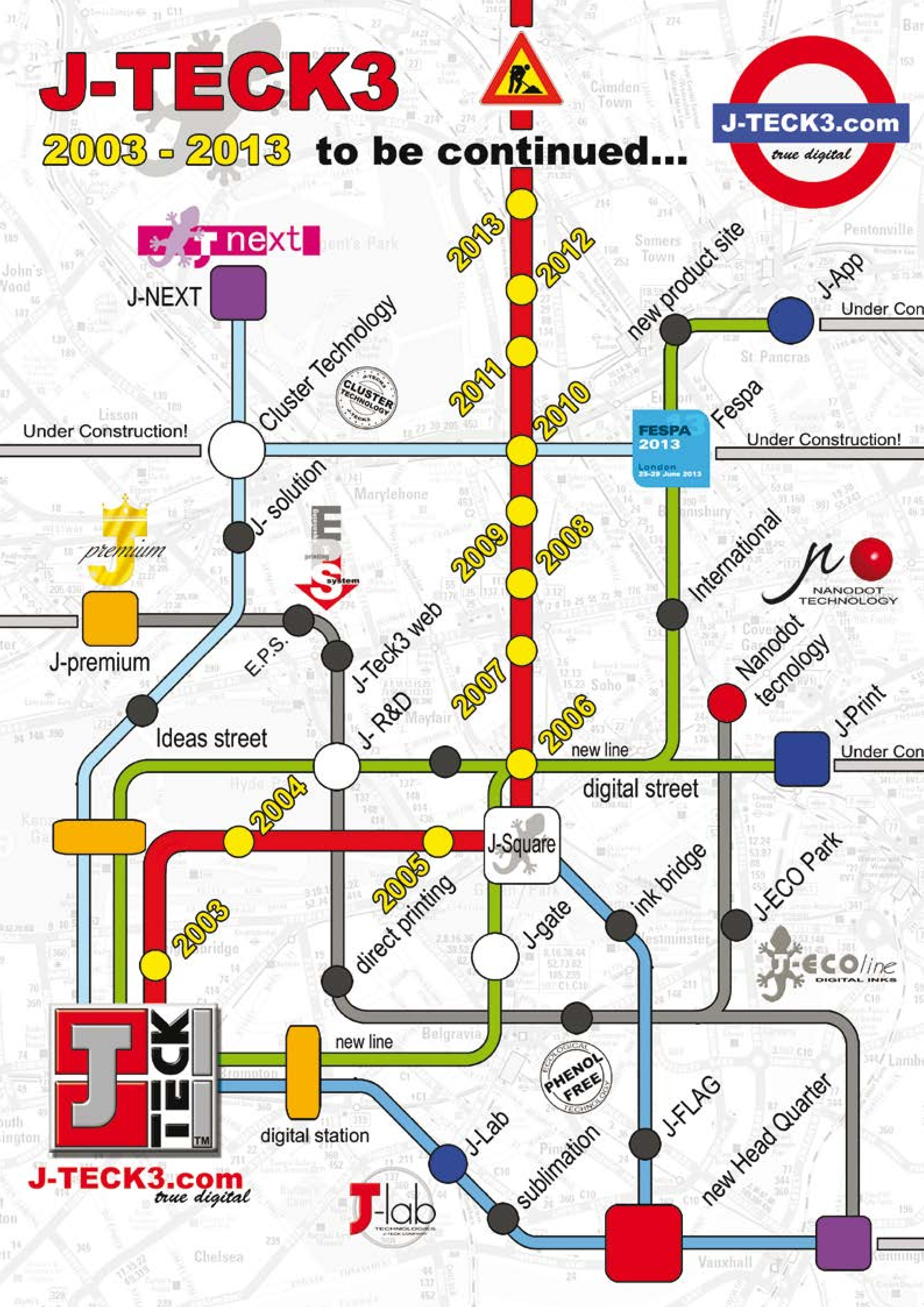
MEETING UNCOMPROMISING QUALITY STANDARDS

Medicraft's lead times are critical, its specialized inks are difficult to work with and its quality standards are uncompromising, all of which place extreme demands on the company's screen-printing equipment.

"Every surgical tray that we screen-print is evaluated by an elaborate quality control system, and would be rejected if not perfect, but the equipment meets our standards," says Seiz. ■

Mark Vasilantone is President of Vastex International

Further information:
Vastex International Inc, Allentown, Pennsylvania, USA
tel: +1 610 434 6004
email: info@vastex.com
www: www.vastex.com



J-TECK3
2003 - 2013
to be continued...
J-TECK3.com
true digital
next
J-NEXT
Cluster Technology
CLUSTER TECHNOLOGY
Under Construction!
J- solution
premium
J-premium
E.P.S.
printing system
J-Teck3 web
J- R&D
Ideas street
2013
2012
2011
2010
2009
2008
2007
2006
2004
2005
2003
new line
digital street
J-Square
direct printing
J-gate
ink bridge
new product site
J-App
Under Con
Fespa
FESPA 2013
London 25-29 June 2013
Under Construction!
International
NANODOT TECHNOLOGY
Nanodot tecnology
J-Print
Under Con
J-ECO Park
ECOline
DIGITAL INKS
PHENOL FREE
ECOLOGICAL TECHNOLOGY
new line
digital station
J-Lab
sublimation
J-FLAG
new Head Quarter
J-lab
TECHNOLOGIES
J-TECK3.com
true digital

MOVING INTO NEW DIMENSIONS

Harald Gavin describes how high technology can help screen-printers gain a competitive edge

Although it was founded in 1955 the story of today's ISIMAT began in 1995 when Peter Detzner became owner and Managing Director. He started to change the company from a specialist screen-printing machine manufacturer in the German market place to a high-technology supplier in the global market.

Since its foundation, ISIMAT has focused on building screen-printing machines for printing onto three-dimensional objects. In the early days these objects ranged from oil drums to syringes, from candles and Christmas baubles to ski sticks and skis. In the seventies and eighties the company successfully grew through sales of its multi-colour automatic screen-printing machines for printing onto beverage crates but, in the early nineties, the market for these machines became saturated and ISIMAT's business shrunk. There were only nine employees left when Detzner bought the company in 1995. He believed that the employees' practical experience in screen-printing, product handling and machine design could be combined with new control technology; the result would be screen printing machines that would enable national and international screen printers to gain a competitive edge.

Photo-realistic images flexo printed directly onto plastic tubes

GLASS DECORATION WITH CERAMIC INKS

In 1998 ISIMAT launched a multi-colour screen-printing machine for glass decoration with ceramic inks. This machine had fixtures on an innovative rotary indexing table; these fixtures held glass items securely on their way through the machine. Gears driving screens and fixtures stayed in drive contact with the main drive gear at all times; highly accurate colour-to-colour registration was maintained without the need to re-register the items in each printing station.

Rotary indexing tables – and, later, indexing rings – proved to be superior to chain based transport systems, and this design concept was used in the design of a new screen-printing machine, the TS 6090, for printing with UV inks onto extruded tubes for the cosmetics industry. The first TS 6090 was shipped in 1999. Performance of these machines and the print quality they delivered established ISIMAT as supplier of choice for tube manufacturers who were looking at screen-printing machines for tube decoration.

The successful use of UV inks in plastic decoration led to their trials in glass decoration. These trials failed because of insufficient adhesion of UV inks to glass surfaces; UV inks came off after a few cycles in a domestic dish washer. ISIMAT started a research project in co-operation with a research institute to find a way to overcome these adhesion problems. The successful outcome of the project was the patented two stage UVitro surface treatment process. In the first stage a glass surface is thoroughly cleaned by a flame, and then in the second stage an adhesion promoter is flame deposited onto the glass surface.

Tube manufacturers from four continents take a close look at the TH 8130 during the launch celebration

RS 7480 screen-printing machine with a UVitro surface treatment machine in line with the infeed conveyor

Glasses printed with UV inks on the outfeed conveyor. These glasses are ready for packaging.

Stefan Sahm-Rastal, Rastal's Managing Director on the left, and Peter Detzner, ISIMAT's Managing Director, at Glasstec 2008 announcing Rastal's decision for a RS 7480

Tube manufacturers from four continents follow the print demonstration during the launch celebration of the TH 8130

SUCCESSFUL SURFACE TREATMENT

Bottles and glasses that were treated with UVitro and then decorated with UV inks passed a number of practical tests; the glass decoration did not deteriorate during more than 400 cycles in a domestic dish washer, or when taken in and out of a freezer.

Over the past few years another trend has emerged in the glass industry; complex shaped bottles became popular for marketing premium brands. These bottles are not round, and their shape varies with height. For example, a bottle with a square base changes shape seamlessly to an oval shoulder. Complex shaped drinking glasses, such as triangular or square glasses, also appeared in the market. These shapes cannot be decorated with mechanically driven screen-printing machines; only servo-based screen-printing machines with full CNC-controls can keep squeegee edges in print contact along non-circular contours.

ISIMAT was well prepared for the new demands arising from the need to screen-print onto these complex shapes. Back in 2001 ISIMAT designed a two-colour machine with rotary indexing ring and servo drives – ten fixtures on the indexing ring, two screen axes and two squeegee axes were all individually driven by servomotors. This first machine could only print onto round items. However, designers gained valuable experience in

Continued over

programming servo controlled motion systems when the machine was in production and, soon, a six-colour screen printing machine with full CNC-controls was designed.

SEVEN COLOURS

A seven-colour screen-printing machine for printing with UV inks, the RS 7480, was launched in 2008. The eighteen fixtures on the indexing ring of this machine are all driven by their individual servo-motors and each printing station has three servo-axes. This offers full CNC-control to the operator. The printing stations can follow cross-section contours that have circular, oval and linear sections, and the printing movements in a printing station are also independent from the printing movements in the other stations.

Rastal, a German glass decorator, bought the first RS 7480 for printing with UV inks onto drinking glasses. The often heard concern that UV inks can be scraped off did not deter Rastal. Rastal trusted its own adhesion and durability tests.

Today the demand for glass decoration with UV inks is increasing. UV inks are available in Pantone colours, they are very vibrant and can be printed with a fine mesh. In addition, consumer product companies want to re-enforce their green credentials and demand drinking glasses that are decorated with organic inks.

The same increased demand regarding high print quality in glass decoration can also be seen in the decoration of cosmetic tubes, even to the point that there is a demand for printing photo-realistic images onto cosmetic tubes. This can only be done with flexo printing; neither screen-printing nor offset printing can print fine dots without some smudging. Therefore ISIMAT developed a hybrid tube printing machine, the TH 8130, that has flexo printing capabilities.

BENEFITS OF FLEXO

The TH 8130 has eight printing stations; each station can take a screen printing unit or a flexo printing unit. Screen-printing units and flexo printing units are exchangeable. The combination of screen- and flexo printing in a tube printing machine enables tube decorators to take advantage of the strengths of the two printing processes – flexo printing for photo-realistic images and screen-printing for printing solids and texts. Flexo printed images on dark tubes can look dull because flexo printed ink layers are not as thick as screen-printed ink layers and the dark substrate dulls the appearance of the flexo printed image. Flexo printed images on dark tubes look vibrant when, first, white underlays are screen-printed onto the dark tubes and then flexo printed images are printed onto the white underlays.

The TH 8130 was launched in November 2009. The purpose-designed flexo printing units feature Dynamic Roller Positioning systems that ensure the distance between flexo plate rollers and mandrels will be maintained during printing to ensure that each dot is printed with kiss contact. The Dynamic Roller Positioning system and the newly designed mandrels of the TH 8130 are patent protected.

When a glass decorator introduces printing with UV inks or when an extruded tube manufacturer introduces flexo printing then there is more involved than just installing a new machine. The introduction of a new printing process has to be managed; there will be changes in working practices, in the pre-press preparations and in sample printing. ISIMAT can actively support customers in managing the change processes, helping to ensure that commercial success is not held back by process problems. ■

Harald Gavin is Sales and Marketing Director at ISIMAT

ISIMAT's employees – keeping the best interest of the customers in mind

Servo-motors on an indexing ring for a RS 7480. Each servo-motor will independently drive its fixture

Hybrid tube printing machine with screen-printing and flexo printing units

Further information:
ISIMAT GmbH Siebdruckmaschinen,
Ellwangen, Germany
tel: +49 7961 88625
email: harald.gavin@isimat.de
web: www.isimat.com

PORTUGAL SPECIALIST INVESTS IN HIGH TECHNOLOGY DIGITAL SCREEN MAKING

David Zamith explains why computer-to-screen will assist functional ceramics' printing

Portuguese screen-printer, Decordecal-Ílhavo, has invested in a SignTronic computer-to-screen solution for the production of graphic ceramic decals.

This segment is well structured and positioned for innovation, both for jobs provided for local industry, and for export. Typical applications include porcelain, tiles and glass, with the end of film no longer being considered a disadvantage in this sector.

Based in Aveiro in the Centro Region of Portugal, Decordecal-Ílhavo's move to a computer-to-screen imaging system sees the company investing in second-generation direct digital exposure technology, giving fully automated operation. The solution features a screen loader for ten frames, autofocus, exposure, developing, drying, through to a screen unloader, and represents a fully automatic in-line process.

The StencilMaster STM-TEX has as standard 1,270dpi resolution and brings automation to functional applications, including flexible circuits, signs, decals, and textile pieces and transfers. The system is also invaluable for the production of automobile instrumentation, membrane switches, dials, panels, nameplates, labels, and conductive pastes

The screen-printing industry's different sectors can now benefit from print quality improvements, along with improved registration and faster machine set-up, shorter lead times and less start-up waste. Other advantages are reduced material and minimal labour costs. Overall there is an increase in the rate of utilising print lines and, of course, all film-making processes are eliminated. Now, ten screen stencils can be processed, fully automatically, and with a performance of up to 30 frames/hour.

The use of STM systems with Zeiss imaging optical engines, employing the latest computer-to-screen technologies, enables digital direct exposure onto the coated stencils, bringing benefits to the industry world-wide. All the necessary steps, from the one-bit TIFF to the print-ready screen, can be carried out in a single automatic exposure using the SignTronic STM-TEX.

In Portugal, Decordecal-Ílhavo is a typical example of a graphics' entrepreneur with a dynamic strategy and positive vision. The company's recent investment in the STM-TEX confirms its belief that screen-printing technology has its own space and is very much alive. The company recommends the process for many areas of application including ceramics, both locally and world-wide. As a technology partner differentiator in offset graphic finishing for the illustration sector, innovative effects can be shared in the increasingly important packaging sector. ■

Innovative computer-to-screen technology with the STM-TEX

All steps can be carried out in a single automatic exposure unit

David Zamith is CEO of Ruy de Lacerda & Companhia

Further information:
Ruy de Lacerda & Companhia SA,
Porto, Portugal
tel: +351 226 057 390
email: geral@rdl.pt
web: www.RdL.pt

Grünig-Interscreen AG, Schwarzenburg,
Switzerland
www.grunig.ch

SignTronic AG, Widnau, Switzerland
www.signtronic.ch

WORKING FOR THEIR MEMBERS

Elaine Campling outlines the relevance of trade associations

Chemical industry trade associations are increasingly playing an important regulatory role by representing their members in advocacy matters, responding to consultative documents, participating in collaborative studies and providing support to their members in deciphering complex legislation, technical training and by producing guidance documents.

It is often difficult for individual organisations, especially smaller or medium sized enterprises, to directly interact with legislators and their representatives. Trade associations can co-ordinate the interests of their members and consequently more readily represent their collective interests, either from obtaining consensus of opinion, or by presenting the balanced view point and helping to establish common position points. Large multi-national corporations are typically also members of trade associations. They may be relied upon more heavily by trade associations to commit resource, such as delegates for committees and drive initiatives, but also gain from collective representation and bargaining. Trade association membership is therefore an important asset to many businesses.

Some trade associations will be positioned more to offer support to members by producing technical guidance and training through the work of committees, rather than in the thrust of an advocacy role. Trade organisations directly involved in lobbying will also be involved to varying extents. For example, some will actively commission research and may be involved in media campaigns, whilst others will be more subtle in approach. To be effective in their representation of members, particularly with regulatory bodies, trade associations will be expected to adequately survey a wide contingent of members and provide factual evidence, supported by specific examples.

WRITTEN PROCEDURES

Another important role of trade associations is standardisation, promoting an expected level of commitment to achieving good standards of health, safety, environment, quality and service. Trade associations will often achieve this through written procedures, the issuance of guidance documents, technical briefings, information notes and general news items and is often bound up in the philosophy of the organisation. Most trade associations operate according to a code of conduct, which is binding upon members and will serve also to ensure compliance with defined standards and competition law.

Important partner relationships can be developed by trade associations with suppliers to their members. Other interested parties, such as the customers of members, may also benefit from negotiated initiatives and other synergistic relationships developed by trade associations.

Trade associations may function in a number of different ways; some will operate for profit, many others will be non-profit making organisations that use any surplus revenue towards the administration of the association and achieving their objectives, which should be clearly stated. Trade associations are usually governed by a board of directors or executive committee, responsible for establishing policy and monitoring activities and initiatives, with support from internal committees. Board and committee members of non-profit trade associations are mainly volunteer experts from member companies, who have an overriding desire to see the organisation succeed in attaining their objectives. The board is accountable to the members and will communicate through various means, including annual assemblies, where important matters are voted upon by members.

ESMA'S ROLE

ESMA is one such not-for-profit trade association, founded in 1990 as the Association of European Manufacturers of Screen printing equipment and supplies, later extending membership to companies manufacturing machinery and consumables for the Digital Imaging market in 2000, when digital imaging technology was being developed. ESMA recently opened its membership to consultants and print service providers, further expanding the representation of ESMA.

ESMA is governed by a formally structured board, comprising elected steering committee members (from within the membership) and the chairpersons from several internal committees. The Annual General Assembly (GA) usually takes place in March, the 22nd March this year, with members being invited to a round table discussion during the preceding day. A dinner will also be hosted on the evening of the 21st March, which provides a good opportunity for networking and social interaction with fellow members, another facet of trade association membership.

Another important forthcoming event in the ESMA Calendar is the Golden Jubilee – the 50th Meeting of the Health, Safety and Environmental Protection Committee (HSEP), which will take place in April 2013. The HSEP Committee is proficient at interpreting complex legislation and developing organisational compliance strategies. Their work has helped to successfully guide ESMA members through the difficult times of the REACH and CLP Regulations, representing members' interests in negotiating with regulatory bodies and providing information, support and guidance both to members and their customers. The HSEP Committee develops best practice standards and publishes information on European legislation, chemical hazards, safety data sheets, labelling and other HSE topics.

ESMA member companies will be encouraged to attend this event, which will be used to demonstrate the work of the committee, through a series of technical seminars presented by the HSEP committee covering important regulatory topics, the full programme of which will be available on the ESMA website. ESMA will also launch a new sustainability working group. Sustainability management has generally been part of the remit of several of the ESMA working committees and a significant feature of the HSEP Committee, but the new 'Sustainability Matters' group will be a forum for a more strategically focused approach on important environmental reduction initiatives, on waste and energy use, for example.

Other highlights in 2013 include ESMA's Advanced Functional & Industrial Printing and GlassPrint conferences, to be staged in co-operation with this magazine which ESMA is proud to sponsor.

A full calendar of events can be viewed on the ESMA website www.esma.com and includes exhibitions, technical training and research. ESMA is able to offer members a number of benefits, not least of which include the opportunity to participate in a focused environment with shared values and goals. ■

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

ESMA
Driving Print Excellence

Further information:
ESMA, Sint-Joris-Winge, Belgium
tel: +32 16 894 353
email: info@esma.com
web: www.esma.com

Fujifilm Speciality Ink Systems Ltd,
Broadstairs, UK
tel: +44 1843 872030
email: elaine.campling@fujifilmsis.com
web: www.fujifilmsis.com

AFIP

ADVANCED FUNCTIONAL & INDUSTRIAL PRINTING 2013

6-7 MARCH 2013

The Radisson Blu Scandinavia Hotel, Düsseldorf, Germany

LIMITED SPACE AVAILABLE - BOOK NOW!

6 MARCH 2013 (day one)

TIME	PRESENTATION	PRESENTER
10:00	Arrival, registration and table top exhibition	
11:00	Introduction and welcome	Peter Buttiens, ESMA
11:15	Functional printing using screen or digital printing	Prof G Hubner, HDM Stuttgart
11:45	Inkjet for Industrial applications - scope and limitations	Christian Gasser, Durst
12:15	Agfa's conductive polymer and metallic new inks for functional printing	Bavo Muys, AGFA
12:45	Lunch and table top exhibition	
14:00	TBA	TBA
14:30	Printing and high-pressure-forming with UV-curable inks for the IMD process	Mario Mertens from Marabu and Harald Bader from Niebling
15:00	Functional pressure sensitive adhesives	Günter Perner, KIWO, Kissel + Wolf
15:30	Coffee and table top exhibition	
16:00	Photonic sintering of printed conductive structures for OLED and OPV applications	Rob Hendriks, TNO Holst
16:30	Computer to screen technology – the future in screen production	Andreas Ferndriger, SignTronic
17:00	Inks for touch panel decoration	Frederic Blancher, Encres Dubuit
17:30	Screen printing mesh for industrial precision fundamentals for success	Alexander Seitz, Sefar
18:00	Table top exhibition	
19:00	Networking dinner	
21:00	Close	

7 MARCH 2013 (day two)

TIME	PRESENTATION	PRESENTER
8:30	Table top exhibition	
9:00	Volume printing of multilayer products	Prof T Claypole, Swansea University
9:30	Material developments in film insert moulding (FIM / IMD)	David Parker, MacDermid Autotype
10:00	Conductive inks	Ryan Banfield, Conductive Compounds / PrintColor
10:30	Dual-cure lacquers as protective coating for film insert molding applications	Dr Hans-Peter Erfurt & Stefan Zaeh, Pröll
11:00	Coffee and table top exhibition	
11:30	Computer to screen latest generation - much more than replacing films	Alessandro Scolari, G4 Automation
12:00	Clevios™ conductive polymers for printed electronic applications	Dr Detlef Gaiser, Heraeus
12:30	High speed flatbed violet and UV imaging technologies, and its applications	Bart Wattyn, Xeikon
13:00	Lunch and table top exhibition	
14:00	Sintering and applications of copper conductive inks	Jonathan Tunbridge, Intrinsiq
14:30	Printed EL circuits and antennas	Steve Jones from PEL and Peter Dyreklev from ACREO
15:00	Printed humidity sensor circuit with inkjet and aerosol jet printing	Laurent Seronveaux from Sirris and Qiang Chen from KTH
15:30	Sum Up	Peter Buttiens, ESMA
15:45	Table tops	
17:00	Close	

Programme subject to change

EXHIBITORS INCLUDE: AGFA, Asada Mesh, Durst, Encres Dubuit, Fimor, G4 Automation, Grünig-Interscreen, Heraeus, Hönle, Hy.tech Forming Systems, Intrinsiq, KIWO / Kissel + Wolf, MacDermid Autotype, Marabu, Natgraph, PEL, Printcolor, Pröll, Saati, SEFAR, SignTronic, SPS Technoscreen, Sun Chemical and Xeikon.

ESMA
Driving Print Excellence

Visit www.afip2013.org to register now or call +32 16 894 353 for more details

PLANNING FOR THIS YEAR AND BEYOND

Michael P Fox reports on the forum group's fall meeting

Mike Fox.

Our NASMA Forum Group met in Houston, Texas, on 16 November, 2012, where we were hosted by KIWO located in Seabrook, Texas. Our mission remains to provide a forum where senior executives and owners of North American speciality manufacturers serving the printing industries can meet to discuss current trends and outlooks for the future. The recent US national elections provided an interesting backdrop to this year's fall meeting.

As is our routine, each forum group member provides a personal and professional update. The group was very pleased with the outcome of this year's SGIA Show. Attendance was good and there were serious buyers at the show. Generally, all companies represented are having good years. However, everyone indicated that activity in Europe and Asia was down. This dove-tails with the economic issues facing the Euro Zone and the challenges in Asia. Increasingly, member companies are focusing on industrial markets.

We had a great opportunity to listen to Troy Smith, CEO of Pointsmith, a major national point-of-purchase marketing management company located in Houston. Troy shared his story of how Pointsmith transformed its business to focus on its major customers while adopting best practices in the new digital print marketplace. Troy's comments were very timely as our members are all dealing with the transition from analogue to digital technology and how we all can remain relevant and profitable. One of the nuggets we all left with was selling to the next generation millennia. Very interesting views of how this generation wants to be served were presented.

Tim Greene, a Director at InfoTrends, met with our Group. InfoTrends is the leading world-wide market research and strategic consulting firm for the digital imaging and document solutions industry and provides research, analysis, forecasts, and advice to help clients understand market trends, identify opportunities, and develop strategies to grow their businesses. Tim shared his view of the changes we can expect in the digital markets world-wide. Tim's comments were very timely as our members plan for 2013 and beyond.

As always, we asked our members attending the meeting to give their views of future business decisions affecting their companies. Here is our members' view of key matters discussed:

- They expect sales in 2012 to be better than 2011
- Their marketing spend in 2012 will be the same as last year
- Capital expenditures will be even with 2011
- They will be increasing staff and expect to have wage and salary increases

All members remain cautiously optimistic for 2013. We are peering over the fiscal cliff and hope we don't get pushed over. ■

Michael P Fox is Chairman of NASMA and President of Nazdar

Further information:
Nazdar, Shawnee, Kansas, USA
tel: +1 913 422 1888
Email: mpfox@nazdar.com

TOMORROW'S WORLD IS PACKAGING AND INDUSTRIAL PRINT

Frazer Chesterman explains the positioning of the new InPrint exhibition

Just after Drupa print guru Andy Tribute claimed that the future for print lay in the opportunities for ink-jet technology in both packaging and industrial Print. He explained: "Ink-jet technology has lots of potential in these areas. They are both getting better and better in terms of quality, and these markets are ones that will drive print forward. It is worth owning some intellectual property within the industrial space, at least."

I believe he is right. Let me explain why.

Most manufacturers agree that the huge growth of digital graphics, which probably began between 2002 and 2005 and has continued to grow, is now maturing, some would even say stagnating! The great migration from analogue to digital in sign and graphics has taken place and will probably level out by 2014/15. The manufacturers have watched their sales plateau and need to find their next opportunity.

INTERESTING APPLICATIONS

The technology around ink-jet continues to develop towards more and more interesting applications. Advanced print-head design is now allowing ink-jet to become more main stream in industrial and manufacturing applications, fulfilling the demand for high quality, high productivity and increased reliability in advanced technological applications. This is supported by more sophisticated and complex, but more durable and flexible ink and fluid chemistries.


Marcus Timson and Frazer Chesterman, directors of InPrint 2014.

UNDERSTANDING INK-JET TECHNOLOGY

What is really interesting is where the demand to understand the technology comes from. A couple of months ago, I was asked to attend a meeting of key print buyers from Unilever, Pepsi and Ferrero Rocher, who manage and control the print packaging for these key FMCGs. They understand flexo printing, but were really excited by the possibilities of digital ink-jet for short run, versioning, VDP and printing on delicate surfaces. Forecasts from PIRA on digital into packaging suggest that as much as 8% of packaging could be digital by 2016, but at the moment only 8% of 8% is being deployed, probably because there is a lack of understanding by the packaging industry on what the possibilities are.

Combine this with developments in software which allow integration within production lines, product recognition, and print on curved surfaces and direct from internet opportunities and then options for use become really interesting.

So what can be printed on and where are the new possibilities?

Well it is clear that vinyl, paper and card are well established, but what is increasingly becoming more mainstream are industrial plastics, ceramics, natural and synthetic textiles. And even more exciting is the growing demand for architectural glass, automotive glass, packaging, metals and printed electronics.

So perhaps it is down to the manufacturers to educate the potential customers on how they can use digital ink-jet. Certainly, we need to be 'leading the horse to water'.

Our new event InPrint 2014 is designed to do just that – to showcase state-of-the-art speciality print and the latest advances in industrial ink-jet and 3D rapid prototyping and introduce ink-jet technology to a whole new set of customers.

Taking place from 8 to 10 April 2014 in Hannover, alongside the Hannover Messe or Hannover Fair, the world's leading tradeshow for industrial and manufacturing technology for production, InPrint provides the perfect and unique platform to connect with manufacturers, developers, industrial print production companies and traditional print companies looking to develop new revenue streams and production processes.

This is not like the whole raft of other print events around Europe. This is for the customer of the future, this is for them to experience Tomorrow's world! ■

Frazer Chesterman is a Director at FM Brooks

Further information:
Mack Brooks Exhibitions Group,
Leatherhead, Surrey, UK
tel: +44 1372 370892
email: frazer.chesterman@mackbrooks.com
web: www.inprintlive.com

THE COUNTDOWN BEGINS FOR FESPA BRASIL

New exhibition boasts international exhibitors from all sectors

A year ago Fespa announced the launch of its new exhibition Fespa Brasil, and since then it has steadily been gaining traction in the local and international markets. The show runs from 13 to 16 March 2013 at the Expo Norte in Sao Paulo.

At the heart of Fespa Brasil's proposition, and in line with the organisation's profit-for-purpose model, the exhibition will be home to an array of educational content with the view to inspire print solution providers on how to 'build their business success' – the shows overarching message. There is the chance to gain ideas and the latest industry information from experts and international leaders.

During the event, visitors will be able to attend free seminars delivered in the four-day International Congress. Each day focuses on a different market segment, including a full day dedicated to screen-printing, with sessions exploring trends, technologies and applications, as well as business issues such as productivity, marketing and sales.

Alongside this, vehicle graphic installers will be able to benefit from daily training sessions hosted by sponsor 3M. This offers practical advice and best practice for vehicle wrapping, coupled with the chance to watch contestants in the penultimate Wrap Cup Masters Series before the exciting Grand Final at Fespa 2013 in London which takes place from 25 to 29 June.

EDUCATIONAL AREAS

Attendees at Fespa Brasil can also take advantage of additional educational areas. Featured are work-shops on garment decoration covering screen-printing, sublimation and digital textile topics. Plus visitors can explore the various applications possible with digital printing in different environments.

The exhibition, which is being hosted alongside ExpoPrint Digital (organised by Brazilian company APS Feiras & Eventos), provides visitors the opportunity to see the latest product solutions across the full spectrum of digital printing in one location. Besides show-casing wide- and narrow-format applications of digital printing, the show also focuses on garment decoration and screen-printing, having attracted significant exhibitor presence in both sectors.

Fespa Brasil boasts presence from international screen-printing companies such as Sefar, Marabu, Vastex, Watts and Chemical Consultants, as well as strong local manufacturers IMAH, Genesis and many more. The exhibitor list also includes key digital manufacturer brands Fujifilm, Mimaki, Roland, and leading Brazilian distributor Sign Supply.

Fespa exhibitions provide education as well as the chance to see new and existing technologies

POSITIVE RESPONSE

Exhibition Manager Michael Ryan comments: "The response from the market has been very positive. We have received large delegations of Brazilian printers to our European exhibitions, especially the flag-ship event, which demonstrates their commitment to gaining the very latest industry information. We are thrilled to host Fespa Brasil in order to reach a wider audience, bringing international information to the local market. With the next Olympics and FIFA World Cup being hosted in Brazil, it is the perfect setting for the exhibition as well as a prime opportunity for printers to prepare themselves and their businesses to gain the maximum from these events." ■

Fespa Brasil represents a new addition to the association's calendar

FESPA 13 BRASIL 2013
São Paulo
13-16 March 2013

Further information:
Fespa, Reigate, Surrey, UK
tel: +44 1737 240788
email: info@fespa.com
web: www.fespa.com

INDEX TO DISPLAY ADVERTISERS

High efficiency

with low VOC emission and very long working life – KIWOCLEAN® LM 789 E

- **Innovative multi-purpose stencil cleaner**
  recommended for solvent-based, UV and plastisol inks
- **Excellent dissolving power**
  for UV, solvent based and plastisol inks
- **Low odour**
- **Reduces ink and emulsion staining**
  and cuts down additional haze removal
- **Very low VOC content**
- **Flashpoint >100°C**
  meets EN1010 explosion protection requirements
  for use in automatic screen washing units

Find out more about KIWOCLEAN LM 789 E and its advantages for cleaning your screens.
The CLEANLINE team will gladly demonstrate this innovation on your premises.

Please contact us
for an appointment:

Manuel Schöllig
Phone: +49 6222 578-164
Manuel.Schoellig@kiwo.de

Perfect stencil making
products · concepts · solutions

KIWO · KISSEL+WOLF GmbH · In den Ziegelwiesen 6 · 69168 Wiesloch · Germany
Tel +49 6222 578-0 · Fax +49 6222 578-100 · info@kiwo.de

www.kiwo.de