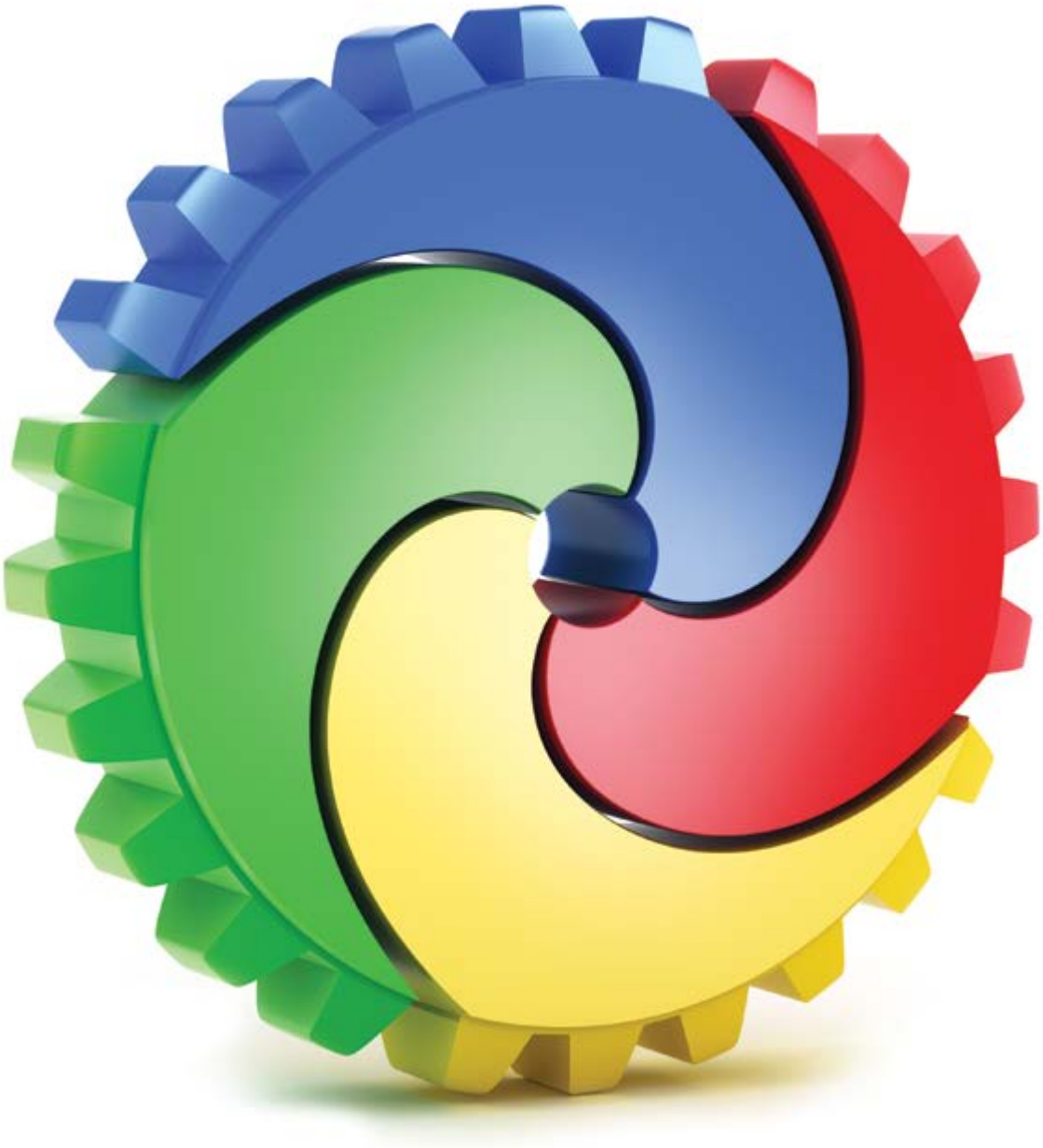
ISSUE 2
2016

GLOBAL TECHNOLOGY IN FOCUS

DIGITAL SCREEN AND PAD PRINTING

SPECIALIST printing worldwide



double ...

your vision

UJV55-320

eco

SG SIGN & GRAPHICS

The world imagines ...

Introducing UJV55-320 ... a new generation of high performance LED UV inkjet printer

The all new UJV55-320 from Mimaki, featuring the power and versatility of twin-roll simultaneous printing, delivers a unique combination of high quality super-wide output for volume production of banners, retail, exhibition and window graphics up to 3.2 metres wide.

Double your Vision with the **new UJV55-320**

Let's Create ... **Together**

... elduob

UJV55-320

Mimaki UJV55-320 delivers

Mimaki

info@mimakieurope.com @MimakiEurope
www.mimakieurope.com

WELCOME

Investing in new technology and thoroughly evaluating the best techniques to adopt has been a must for users of screen and wide format digital printing systems to stay competitive in recent times, and since Specialist Printing Worldwide first published nine years ago, we have kept our international readership well-informed of the latest technologies available to assist with their day-to-day businesses.

Often complimenting tried and tested screen-printing techniques, many of the advances during this time have come from the digital printing sector and there was certainly no shortage of innovation on show at the successful FESPA Digital exhibition in March.

Specialist printers from around the world will now gather at drupa 2016 to learn about the latest solutions using a vast assortment of print techniques, and with innovative developments in screen-printing likely to match the dynamic strides in digital, we look forward to meeting subscribers and advertisers in halls three and six on the pavilions of one of our sponsors, ESMA. There might just be time for us to digest the advances from the spring events before we start planning for InPrint, SGIA Expo, IJC and the FESPA exhibitions in the autumn!

The quality technical content in this issue features our normal broad coverage of many of the techniques and products available in the industrial, textile and graphics sectors. If you picked up this copy at drupa, or received it as a promotional copy by post, the ONLY way to benefit from the educational content in all future issues is to subscribe now at www.specialistprinting.com

Bryan Collings, Publishing Director, Specialist Printing Worldwide

SOPHIE SAYS...

4. The views of Sophie Matthews-Paul, *Specialist Printing Worldwide's* editorial consultant

PRE PRESS

6. The potential for the future
Peter V Fleischer and Julia Fleischer discuss functional screen-printing applications

8. Stopping the slump
Professor Steven Abbott concentrates on complex printing faults

12. Understanding the guidelines
John Nate discusses colour standards and specifications for wide-format printing

14. Creating a winning combination with opposing forces
Nancy Gray considers the technical issues when selecting the appropriate thread count for the screen mesh

16. The benefit of capillary film over direct emulsion
Larry Tywater asks can you really afford not to use it?

22. Achieving accurate and consistent colour in digital printing
Wolfgang Passler describes the relevance of process control

26. The laws of physics in screen-printing
Professor Steven Abbott explains why fighting science is a bad idea

28. New manufacturing processes and all-in-one solutions
Andreas Künkele observes today's industrial screen-printing applications

ON PRESS

30. Printing around cylinders and tapers
Ben Adner explains options for short-run production

34. How specialist inks can add the 'wow' factor
Terry Kimrey describes special effects using the screen-printing process

36. Which ink cartridges really give value for money?
Jill Bach describes why cutting corners is a false economy

OVERALL TECHNOLOGY

38. The power of laser technology
Robert W Boyes puts marking and engraving into the spotlight

42. Head and shoulders above the rest
Gillian Montanaro explores ten ways to stand out from the print crowd

46. Where is the printing of packaging heading these days?
Cristiano Bettè and Francesco Ferrari outline today's higher demands

HEALTH : SAFETY : ENVIRONMENT

48. Is global harmony in your facility?
Chuck Nall explores the need for greater responsibility in protecting resources

50. The continuing impact of regulations
Elaine Campling explains the meaning of the latest set of requirements

COMPANY FOCUS

52. Digital expertise to match traditional screen-printing strengths
Specialist Printing Worldwide spoke to KBA-KAMMANN's Dr Christian Maas

CASE STUDIES

54. Perfection is the key to success
New drying technology boosts high-end screen-printing capabilities

55. Trendsetting technology uses digital versatility
New installation sees test phase successfully completed

IN BRIEF

57. A round-up of news and new technology

FOCUS ON ESMA

64. Showing the potential of functional printing in Düsseldorf
Innovation for decorative and industrial applications to feature strongly

EVENTS

65. FESPA Digital 2016
66. Drupa 2016
68. InPrint
72. AFIP 2015

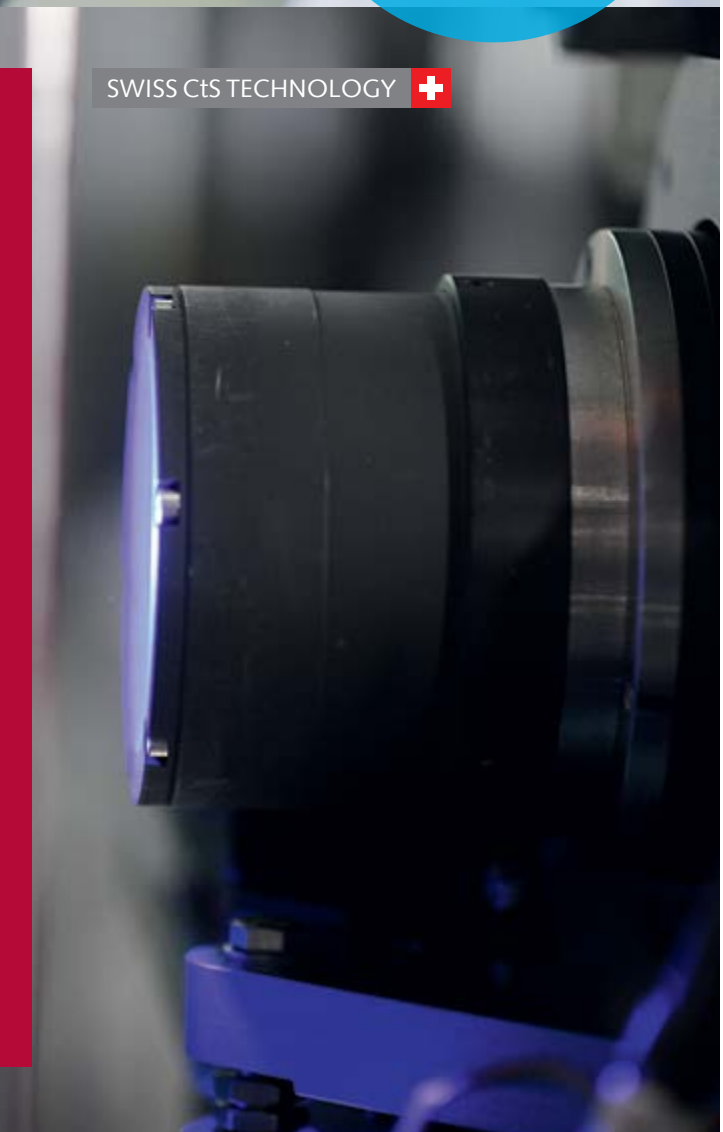
FOCUSING ON THE PRINTING SCREEN

AUTOMATION
sets new standards in screen making. Whether you need solutions for **Industrial, Textile** or **Graphic** applications – the core of modern screen printing is always **«the perfect screen».**

Grünig

STRETCHING
COATING
WASHING

Grünig-Interscreen AG · CH-3150 Schwarzenburg
www.grunig.ch · mail@grunig.ch



DIGITAL CtS DIRECT EXPOSURE BROUGHT TO PERFECTION

TECHNOLOGY
the decisive factor permitting direct exposure on the screen, without compromising on quality. Your advantages? Elimination of processes, **film-free solution,** improved printing quality and **lower screen costs.**

SignTronic® AG

DIGITAL
SCREEN
MAKING

Sign-Tronic AG · CH-9443 Widnau
www.signtronic.com · info@signtronic.com

LOOKING BACK ON TEN DIGITAL YEARS

Positioned with a reasonably acceptable amount of space before Drupa, I was still intrigued to see how well FESPA Digital would fare this year given the inevitable crossover for exhibitors and visitors intending to cover both shows. It could have been a tough act putting on a major event that carried the additional pressure of celebrating its tenth year but, as it turns out, the organisers had nothing to worry about, and the missing participants who had opted not to attend largely passed unnoticed.

In truth, while Drupa intends to be all things to all printers, this year's FESPA was very clearly a digital jamboree and never tried to be anything different. True, there was the addition once again of the European Sign Expo which held its own in admirable fashion but, to me, the only notable shifts in emphasis were towards textiles and interior decor. This is not to say that manufacturers didn't use the opportunity to launch print engines incorporating eco-solvent, UV-curable and aqueous-based chemistries but everywhere you turned there seemed to be fabrics and associated ink formulations. These dominated the display as well as the garment sectors and, probably for the first time to date, there was a definite and positive mood that defined the confirmation of interest in these sectors from a digital standpoint.

A DECADE OF DIGITAL

When the first FESPA Digital was held at the RAI in Amsterdam ten years ago ink-jet had already taken hold as a serious, mainstream production process and I remember even back then that textile printing was starting to be featured, albeit in a comparatively small way. In 2006 we were very much on the crest of the UV-curable wave having followed a steady growth pattern since the millennium. At FESPA Munich in 2005 we saw confirmation of the way the digital future was heading as this was, of course, the year that acquisitions began to make themselves felt as manufacturers were capitalising on the opportunities that lay ahead.

FESPA's decision to strike out with a purely digital show was shrewd, even though some of the years felt a little flat because technologies were becoming accepted and no longer generated their former levels of excitement in terms of innovation. Nonetheless, these events which sat in between the major shows that also included screen-printing certainly made their mark and, because the organisers were wise enough simply to adopt the moniker of digital, it meant there was no limitation in future direction. Thus, although at the time, concentration lay primarily on the wide-format display market segment, the past decade has demonstrated how ink-jet and its related media, inks, software and finishing processes have all spread their tentacles into new areas.

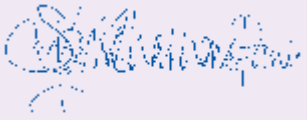
Fabrics were strongly in evidence at FESPA Digital 2016

ADDING VALUE TO OVERALL KNOWLEDGE

The advantage of an annual digital exhibition might be seen by some as becoming diluted with the various conferences that now take place throughout the year. But, while these add value to overall knowledge and, in particular, specialist areas such as functional and textile printing, they do not remove the need for a common platform where manufacturers and suppliers can sport their wares in an open environment.

Looking back, the decision made by FESPA in 2006 to launch its dedicated digital show might not have worked and the whole idea could have been a dismal failure. Part of its success has been down to the enthusiastic attitude of the association, of course, but overall the timing was right because the wheels of technology just happened to be turning at the right pace to justify annual updates. Such is the nature of digital print, there has been plenty that is new enough to command interest on an on-going basis and this has certainly helped to position the yearly exhibition as a relevant and important date on most people's calendars.

Ten years is a long time in an industry which is driven for the most part by technology. Where devices have come and gone in far shorter periods of time, and are now merely distant memories of gadgetry that have no lasting value, the developments in digital print have been such that this was never going to be a passing fad that ended up as a costly white elephant. Ink-jet and its associated processes have been clever in slotting into current and future trends, witnessed currently in a variety of growth areas that includes textiles and functional applications. The gamble that might have been FESPA Digital 2006 has certainly paid off as endorsed by this year's show, confirming a trend that is here to stay. ■



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

COOLER ENGINES BOOST PROFITS

EFI's "cool cure" technology lowers temperatures across our full line of roll-to-roll, hybrid and narrow web LED printers, enabling you to print on thinner and speciality substrates. Plus, you'll lower energy and consumable parts costs. Pretty cool, right? Fuel your success at **vutek.efi.com/LED**

drupa

DRUPA 2016
Düsseldorf, Germany
Hall 9 — A40
May 31 - June 10, 2016

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

Specialist Printing Worldwide is published by:
Chameleon Business Media Ltd,
1 Cantelupe Mews, Cantelupe Road
East Grinstead, West Sussex RH19 3BG, UK
Tel: + 44 (0)1342 322133
Fax: +44 (0)1342 322664
www.specialistprinting.com

Specialist Printing Worldwide (ISSN No: 2044-2319) is published quarterly by Chameleon Business Media Ltd, GBR and distributed in the USA by Asendia USA, 17B S Middlesex Ave, Monroe NJ 08831. Periodicals postage paid New Brunswick NJ and additional mailing offices. POSTMASTER: send address changes to Specialist Printing Worldwide, 701c Ashland Ave, Folcroft PA 19032.

THE POTENTIAL FOR THE FUTURE

Peter V Fleischer and Julia Fleischer discuss functional screen-printing applications

Screen-printing is able to manage a variety of different applications through the integration of mesh and precision screens in existing manufacture processes. Especially in the field of industrial screen-printing, this opens up new possibilities of rationalisation and individualisation of printing processes. Numerous opportunities of applications of tachometer displays, rear window heater or vehicle sensors in the automotive industry via printed cylinder head gaskets, circuits as well as antennas in the electronic segment up to solar cells, OLEDs, MLCC (Multi-Layer Ceramic Capacitors), touch panels or also fuel cells demonstrate all these possibilities very well.

But the potential of screen-printing has not been exhausted as there will be many more still undiscovered applications in the future.

Solar cell production (mono as well as multi-crystalline cells) shows a field in which an even thinner but at the same time a higher number of fingers of conductive silver paste is required to achieve high performance cross-section as well as a very low light-obscuration on silicon wafers.

The use of highest quality materials is very important to reach finest conductive lines and structures less than 40µm, 30µm and even 20µm with narrower bridge width (L/S 20µm).

CONSTANT COLLABORATION

At Drupa 2016 PVF will demonstrate an impressive variety of different applications. We are developing and producing the highest quality products and screens in constant collaboration with the best Japanese mesh manufacturer in the world to satisfy the high requirements in industrial and functional printing.

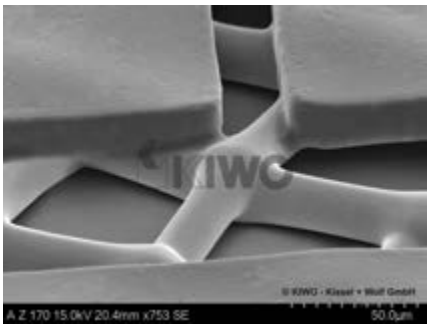
The interaction between finest stainless steel mesh like 730-013, 640-015, 400-018, 360-016, 325-016 and high resolution coating material with best edge sharpness also at a higher EOM and minimal bleeding effect is central.

Only finest stainless steel mesh woven out of 19µm, 18µm, 16µm, 15µm and 13µm threads enable the printing of a 40µm, 30µm and 20µm structure in the mass production. This mesh responds to a special treatment within so-called 'Combi' screens. Thereby the fine stainless steel mesh will be kept by a support mesh (mostly polyester mesh). Micron-precision screens meet with minimal structures (>= 50µm) the highest requirements of the precision screen-printing sector. Tension of the screens as well as accuracy is constant at a run of more than 20,000 prints. A high accuracy of it (<= 20µm), highest lifetime, low voltage loss, a less overstretching of the mesh, a raising of the elastic area and a fine line compatibility up to 20µm are special characteristics of the Combi screens.

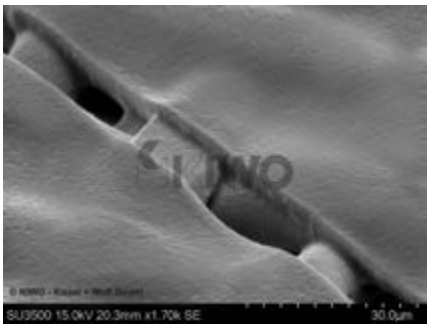
To achieve optimal printing results it is very important that the Micron-screen shows the right mesh as well as exhibits special requirements in the coating process. Thereby to guarantee a high sealing conduction between substrate and screen to avoid a bleeding of the paste, the surface roughness value paired with an excellent paste release behaviour of the coating plays a significant role.

By having the best coating, the complete release of silver paste during printing will result in a higher aspect ratio and a silver paste cost reduction.

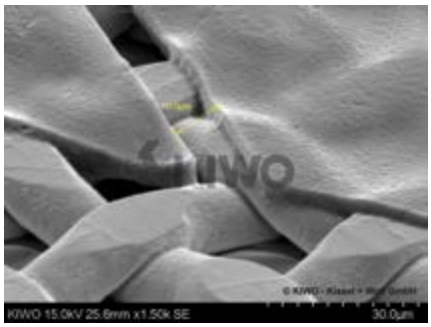
Of enormous importance is also the reproducibility of the printing picture. It is



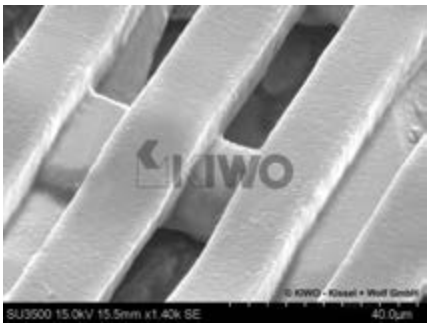
AZOCOL Z 170 FL on 400-018 special mesh; EOM 13µm; RZ 3µm, 20µm line



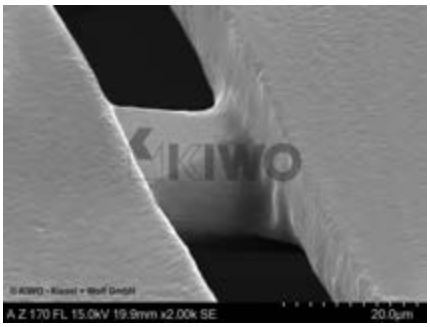
AZOCOL Z 170 FL on 730-013 metal mesh; EOM 3µm; RZ 3,8µm, 10µm line



AZOCOL Z 170 FL on 730-013 metal mesh; EOM 3µm, RZ 3,8µm, 10µm line



AZOCOL Z 170 FL on 400-018 metal mesh; EOM 11µm, RZ 3,3µm, 15µm line



AZOCOL Z 170 FL on 400-018 metal mesh; EOM 13µm, RZ 3µm, 20µm line (expansion 2000x)

possible to emulate a previous print very precisely due to the use of our extremely dimensional stable stainless steel mesh along with best coating material. This is especially evident when double printing on silicon wafers, and is of high relevance.

To satisfy the highest requirements in industry and provide best possible performances it is indispensable to use unique high performance raw materials paired with a standardised and documented clean room production process. To this end we are delivering the Micron screen for perfectionists with finest lines down to 20µm, an exact positioning accuracy, highest screen life, reproducible quality and best printing results.

SCREEN PRINTING 4.0

At PVF we are taking the next step and offering mesh and screens out of tungsten (mesh geometry 430-013, 325-016) to push the screen-printing process to the next generation in advanced functional industrial printing. Feel free to contact us about the advantages and opportunities of these unique mesh types. Furthermore we are forcing the actual thread development in the stainless steel sector of a thread diameter of 11µm.

Regarding industrial screen-printing, PVF provides primarily screen-printing relevant mesh materials like nylon, polyester (finest threads 24µm) V-mesh (finest threads 23µm) and stainless steel mesh (finest threads 13µm) as well as covered, pre-coated and ready for printing Micron-precision screens for technical printing. Together we can evaluate individual requirements. ■

Peter V Fleischer and Julia Fleischer are Joint Managing Directors of PVF

Further information:
PVF GmbH, Neufinsing, Germany
tel: +49 8121 4784 0
email: info@pvfgmbh.de
web: www.pvfgmbh.de

STOPPING THE SLUMP

Professor Steven Abbott concentrates on complex printing faults

In this extract from the 'How to be a great screen printer' e-book produced by MacDermid Autotype, Professor Steven Abbott looks at some of the more complex printing faults that can occur and their root causes.

Ink slump is the common term used to describe the fact that a printed drop, or line/track of ink starts off at a certain height/width ratio then "slumps" to give a wider line with less height. As a screen-printer this can affect the colour balance of a four-colour print, or worse, change the functionality of a printed electronics circuit.

Right at the start we need to kill off a common myth about ink slump. As far as screen-printing goes, it has nothing to do with gravity. Our dots and lines are far too small to be affected by gravity and your prints will slump just as much upside down.

So if ink slump has nothing to do with gravity, what is the cause?

It is simply the tendency of your ink to wet the substrate. If you put a drop of water onto the substrate it might do a variety of things. At one end of the scale, if the substrate is Teflon then the drop will just sit there with no slump (A). However, if the substrate is a very clean glass, then the water spreads out, driven by surface tension, until the drop has become very thin (S). When printing a functional ink onto a typical polymer substrate the slump will be somewhere in-between. (See Figure 1.)

The angle the drop makes to the substrate at any time is the 'contact angle'. You start with an 'initial contact angle' and end up with the 'equilibrium contact angle'. A typical drop of water on glass might start with a 60° angle then slowly slump down to 0°. (See Figure 2.)

The theory of spreading (often called Tanner theory) is so complex that it needs a computer model to work out what happens, but the basic (and approximate) rule is straightforward and can be summarised in the table below:

Parameter	Effect of a high value
Surface tension	Fast spreading
Initial contact angle or ink thickness	Fast spreading
Equilibrium contact angle	Slow (or no) spreading
Viscosity	Slow spreading
Viscoelasticity ('tackiness')	No effect

The effect of time is amazing. If it takes one second for a drop to grow to a certain diameter, it will take over 1,000 seconds to grow to twice that diameter! This is because as the drop grows, the contact angle decreases and the spreading speed decreases even faster.

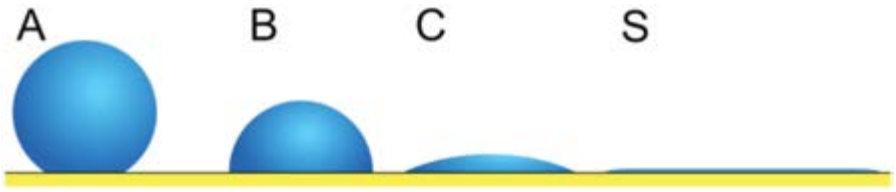


Figure 1

A SIGNIFICANT PROBLEM

For screen-printing inks typically the surface tensions are low and viscosities are high. So you would think that slump should not be a significant problem. But as soon as you go to fine lines, 'significant' takes on a new meaning. Even with very high viscosities, if the printed line/track has an initial high contact angle, then within a few seconds you can easily spread the line by 25µm on each side. So a 50µm line becomes a 100µm line before you've had a chance to dry it or UV cure it. . (See Figure 3.)

Even with very rapid drying of this conventional Silver conductive ink, this 50µ track becomes a 65µ-75µ track, as can be seen in figure 1.

At the other extreme, slumping can cause a different problem.

Some specialist applications require ink deposits which have to achieve a high ink film thickness specification. If, for example, you are trying to print a 500µm wide track with a 100µm ink film thickness using a reasonably viscous ink (~100 Poise) then within two seconds the line has already grown to 700µm wide and slumped to only 82µm thick.

The computer model shows that you would have to have cured that ink within 0.4 seconds to avoid it slumping below 90µm! . (See Figure 4.)

The drop spread software models the 100µ thick x 500µ wide track

CONTROLLING SLUMP

So what can you do about slump?

The table gives you good indications, but there are lots of complications. Changing the surfactant levels can reduce the surface tension and therefore reduce slump, though this isn't always the case in complex formulations. However, surfactants can interfere with the functional aspects of the ink formulation, so this isn't always possible.

The initial contact angle is largely a function of your ink deposit. A thin ink deposit

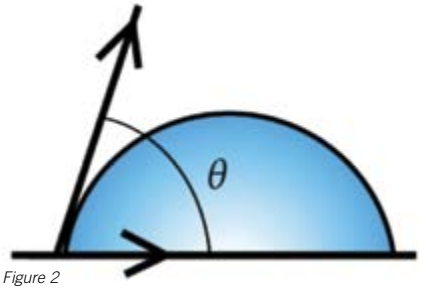


Figure 2

(fine mesh, low-EOM stencil) will give you less slump. As slump speed is proportional to the cube of the initial contact angle, even modest reductions in ink thickness can give large

Continued over

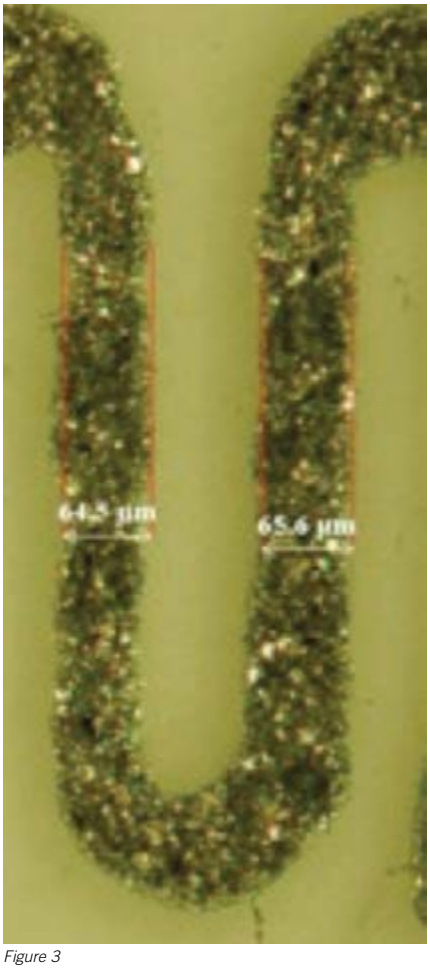


Figure 3

DOUTHITT

CONVENTIONAL OR CTS - DOUTHITT HAS THE OPTIMAL SOLUTION!

NEW DISTRIBUTION PARTNER WITH SIGN-TRONIC!

The world's leading screen image technology from your trusted resource in North America.

Model CTS Digital Screen Imager

No film required - just print the image directly on the screen and expose. Print head technology with solid ink enables better image detail, density, and consistency in a fast robust system. Call us to see if CTS is right for you.

Model DMAX

Model DMZ

Douthitt's self contained screen exposure systems provide the bestvacuum contact and the best registration. Combined with our focused reflector metal halide printing lamps, our units offer the sharpest resolution, best unifomity, shorter exposures and completely hardened emulsion.

Model Sahara Screen Dryer

Uniform air and heat to insure fast and complete drying of screens. Digital temperature control. Any size available.

Olec Olite & Theimer Violux Lamps & Parts in Stock!

Contact us for more information on Douthitt's complete line of Exposure Units, Vacuum Frames, CTS Imagers, Dryers, Inspection Tables, High Wattage UV Printing Lamps, Integrators and Blankets for any vacuum frame.

Visit us at www.douthittcorp.com

SGIA

Once you've seen it you'll never be satisfied until you own it

THE DOUTHITT CORPORATION

Call Toll Free 1-800-DOUTHIT(T) • www.douthittcorp.com

Phone 313-259-1565 Fax 313-259-6806 E-Mail em@douthittcorp.com

reductions in slump. In the thick ink example, reducing the starting thickness to 90µm reduces the width of the slumped line by 20µm.

The equilibrium contact angle is often ignored, but it can be a vital part of your solution. The ink will stop slumping when the contact angle reaches the equilibrium value. So if you tuned your substrate surface energy so the theoretical equilibrium angle was equivalent to the initial angle you wouldn't get any slump at all. This trick has been used in the world of fine-line ink-jet printing where they have very low viscosities and therefore very large slumps.

As we are aware 'viscosity' is not a simple concept, so it's important to know which aspect of viscosity is important for slump. A perfect ink has a low viscosity during the shearing action of the mesh coming out of the ink, followed by a rapid recovery to a high viscosity to avoid slump. In the ceramic conductor industry they can often come close to this ideal as their formulations don't contain polymers. Polymeric inks tend to have less of a reduction in viscosity with shear and are slower to recover, hence the battle with slump is much more difficult.

Ceramic conductive inks are printed onto ceramic substrates. These substrates are often microporous and they rapidly suck the solvent away at the leading edge of the slumping ink. This sends the viscosity skyrocketing and the slump comes to a halt. Crude porous substrates (such as paper) are obviously not a good idea as they destroy edge quality. However, microporous materials (holes in the µm range) do not have a big effect on edge quality. There are some debates about whether micro-roughness can slow slumping.

It's clear that if you have a solvent that flash evaporates, your slump will also be reduced. The downside is that the ink will dry in to the mesh. Finally, if you can cool the substrate relative to the ink on the mesh (either by having a heated ink/mesh or a cooled substrate) then the ink viscosity increases and the slump decreases. An extreme example of this is the printing of thermoplastic inks through a heated steel mesh which solidify almost as soon as they are printed.

SLUMPING ON THE BEACH

Have you ever noticed a 'beach' effect around your printed line or dot? It's an ultra-thin bit of something that lots of us have never been able to analyse or explain. It turns out that the science of slump offers some insight. Spreading of a liquid is impossible without a 'precursor film'. This was at first thought of as a mathematical device to do the calculations, but these films, perhaps only 0.1 micron thick can be seen under the right conditions. There are hints that the polymers in the ink can have difficulty entering the precursor film; if they can't get in then the ink can't spread. This correlation between beach and precursor film is only speculative, but it might be possible for an ingenious ink designer to take advantage of this effect and produce a low-beach, low-slump ink.

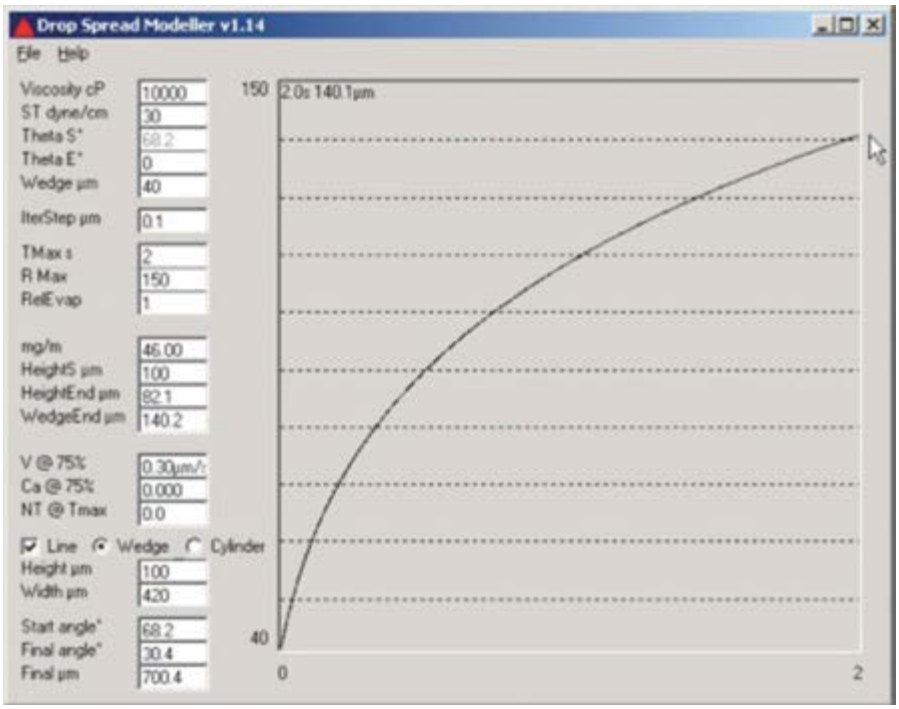


Figure 4

FURTHER COMPLICATIONS

In a perfect world a cross-section through a printed track or dot would have vertical sides and a flat top with well-defined square 'shoulders' and if viewed straight on, the track or dot would faithfully reproduce the artwork.

In reality though, screen-printed images do have a tendency to show up the influences from the mesh leading to a 'saw-toothed' effect in the print. A common 'fix' in the industry is to increase the stencil thickness to create a flatter stencil surface. Although this can be effective, it causes a secondary problem with the ink deposit at the image edges, where the printed track can actually have an 'M' shaped cross section.

Going back to the effects on slump, we have seen that modest increases in ink deposit exacerbates the slump issue, so increasing the stencil thickness to improve the 2D image quality can worsen absolute image reproduction.

The answer to this problem is to adopt a thin and flat (low EOM/low Rz) stencil system which will avoid the 'M' shaped deposit, yet at the same time give excellent image quality.

TAKING CONTROL

'Ink slump' might seem to be a bit discouraging as it has an impact on every screen print, however it is predictable and quantifiable. The secret is therefore to control the factors that have the biggest effect in order to minimise them and to compensate for the slump in the original artwork. This, of course, has been done for decades in correcting four-colour process.

Whilst the latest generation of performance conductive inks are being formulated to minimise the effect as much as possible this is effectively outside the control of the printer. Conversely, the printer does have control over probably the most important parameters, which are ink deposit and image quality. Specifying a thin, flat stencil is the key to minimise and control the effects of ink slump.

For more information on the science behind dot growth go to www.stevenabbott.co.uk/practical-coatings/drop-spread.php.

Although there are many papers on the science of slump, the work of Professor Glen McHale at Nottingham Trent University is especially insightful. His papers on spreading of drops and cylinders are the basis for the computational results shown here and his help is gratefully acknowledged. ■

To download a copy of the MacDermid Autotype e-book 'How to be a great screen printer' go to www.macdermidautotype.com/upload/documents/screen e-book-english.pdf

This article was originally authored by Professor Steven Abbott who was R&T Director at MacDermid Autotype from 1992 to 2009

Further information:
MacDermid Autotype, Wantage, UK
tel: +44 1235 771111
email: screen@macdermidautotype.com
web: www.macdermidautotype.com

UNDERSTANDING THE GUIDELINES

John Nate discusses colour standards and specifications for wide-format printing

Whether you are producing contract proofs or wide-format prints, to create files that a RIP or digital front end will process correctly, you need a good understanding of the latest colour industry standards, specifications and guidelines and how they apply to wide-format printing. Although these three terms are often used interchangeably, they are actually quite different.

DEFINING THE TERMS

Standards are the characteristics and criteria provided by groups such as the International Organization for Standardization, (ISO), that define the type of product being produced. In our industry, this would be a poster, a banner, a brochure, or a book.

Specifications provide a detailed description of the criteria for a product being produced. In printing, specifications can include characterisation data, ICC-profiles, printing stock or media, and ink. When used correctly, specifications can help achieve an optimal end result. Comparing against the appropriate criteria will also allow you to determine whether your printer has achieved the requested specifications.

A guideline or method is not a standard or a specification, but rather an industry or companies' list of requirements and best practices, often followed in order to produce a final product that conforms to a specification.

In a nutshell, for our industry, a standard defines what we are producing (a banner), a specification defines what form it will take (print on a media with a specific white point, using ink with specific defined colourants and characteristics, to conform to a specific look such as ISO Coated), and the method would be the step-by-step procedure needed to generate the banner so that it conforms to the specification.

In a printing workflow, good colour management incorporates all three to pave the fastest and easiest path to accurate colour. From design through prepress and final evaluation, here's how it works.

PROPER FILE SET UP

To ensure that your file will provide the results you want, you need to set it up so the printer's digital front end can reproduce it correctly. Although ISO does not define standards for images or files, there are a few guidelines you can follow.

GIF and PNG are both very common image file types, but neither is recommended for high-resolution reproduction. GIF can only have 256 colours per file, which greatly limits the quality of any gradients and the overall colour quality, and PNG does not support CMYK. These file types are best used when creating websites.

JPG (or JPEG) is another very common file type that is not recommended for print. Although it can support RGB, CMYK, and L*a*b* colour spaces, and embedded ICC profiles, it often uses lossy compression, which can cause artefacts in areas where there's a sudden change in contrast or density. Artefacts may not be obvious in a small printed ad, but when you blow up a JPG file 1000 or 2000% for wide-format printing, they can cause a serious image degradation problem.

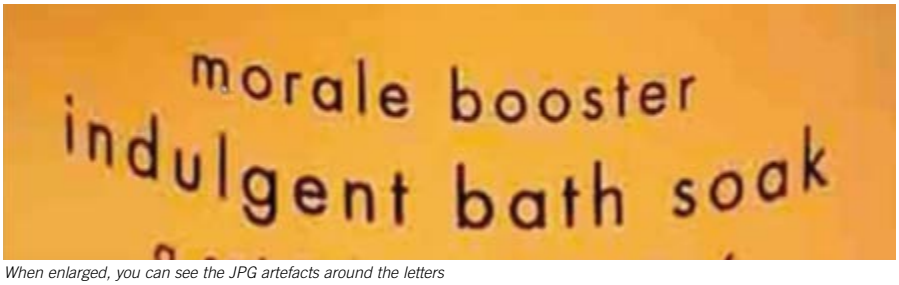
When prepping image files for large-format applications, TIFF is a good recommendation. It supports RGB, CMYK, and L*a*b* colour spaces, as well as embedded ICC profiles. TIFF files can use lossless compression methods which will not create compression artefacts when the file is enlarged, the only limitation is the resolution of the file itself.

If your file contains more than images, such as vector logos, Adobe Illustrator® files, fonts, or text, converting to PDF format is the best way to prepare your files for correct processing. There are a number of PDF options, but you only need to know about two for wide-format printing.

PDF/X-4 is the most flexible because it can contain CMYK, RGB, greyscale and spot colours all in the same file. It allows ICC profiles to be embedded for the entire file as well as each individual element. Transparency and layers are also supported. The downside of this flexibility is that PDF/X-4 files can be difficult to reproduce accurately, and requires your printer to use the most up-to-date digital front end to process the file correctly.

PDF/X-1a is the least flexible because it can only contain CMYK data, does not allow embedded ICC profiles, and does not support transparency or layers. Many prepress shops request PDF-X-1a. Since the designer must do all of the conversions, it is the least likely to cause problems within the RIP when processing the file for use with a platesetter or press.

This TIFF file of a sample label image was converted and saved as a JPG



When enlarged, you can see the JPG artefacts around the letters

CHOOSING STANDARDS AND SPECIFICATIONS

If you are using a print service provider rather than printing the file yourself, the best way to communicate your expectations is to provide the exact specifications for everything, including the colour of the paper, the type of ink, the printing method, and the acceptable colour gamut. To make this easy, there are a number of international specifications for print. Since each specification will provide a different look, it is very important to select the correct one for your application.

Fogra has available a number of specifications. For example, Fogra 39 is used for coated stock, Fogra 48 for newsprint, and Fogra 50 for gloss laminated. Japan Color, used mainly in Japan, includes 4 print conditions. And ISO, the Granddaddy of standards, has specifications for ISO Coated, ISO Uncoated, and ISO Newspaper.

Providing your printer with a specification chart will tell them everything they need to know to comply with the specification you selected. For digital printing applications, this is even easier because the colour specifications are encapsulated within the ICC profile.

EVALUATING THE RESULTS

Once the file is printed, how do you know that the colour is correct? Although your print might look pleasing, it must be evaluated to ensure it is actually within specification. To do this, a colour bar is printed along with the file. There are specific colour bars defined for use with each specification, and the correct one must be selected for proper evaluation. For example, you would normally not use an IDEAlliance colour bar to evaluate a Fogra 39 print.

The colour bar is measured with a colour measurement device, or spectrophotometer, and compared to the aims, or targets, of the defined specification. Aims provide the L*a*b* values for each of the colours; and like colour bars, these values differ between specifications. Since even a tiny difference can result in a big visual change, you need to select the right aim values. Of course, it's not possible to hit exact colour numbers in printing, so each of the governing bodies also publish tolerances – the amount of colour difference that is allowable while remaining within specification.

Viewing conditions are another very important consideration when evaluating the accuracy of prints because the colour and quality of the light will impact appearance. Incandescent lamps are yellow; fluorescent bulbs can be cool white, warm white, or daylight white; and LEDs can come in blue, yellow, red, or white. Since the colour of the light under which you are viewing will actually change the colour look and emotional feel of the print, you should ideally evaluate your prints in a light booth under controlled lighting conditions.

KEEPING UP WITH THE STANDARDS

Staying on top of colour industry standards, specifications and guidelines will help you prepare files that print as expected. Less rejected work will not only save you time and money, it will lead to happy customers and repeat business.

A NOTE ABOUT WIDE-FORMAT PRINTERS

If you are considering the purchase of a wide-format printer for either proofing or production, be sure to consider the RIP or digital front end that processes files for printing. Even when driving the same printing device, there can be a significant difference in the capability of the device due to the capabilities of the digital front ends being used. In many cases, this choice can be as important as which printer you choose.

To learn more about standards and specifications for wide-format inkjet printing, watch the related World of Fiery Webinars recording at http://webinar.efi.com/WorldofFiery2015/WideFormat or view the webinar's accompanying resources. ■

John Nate is Worldwide Technical Product Training Manager at EFI

ADDITIONAL INFORMATION

Idealliance.org – Check out this organisation's Just Enough Video Bank for concise videos on topics such as G7 and GRACoL

Fogra.org – Get the latest news and advice on standards and specifications

Ghentworkgroup.org – Access best practices for publishing and packaging workflows

The M Factor…What Does it Mean? (http://tinyurl.com/mhgegox) – This X-Rite white paper explores Optical Brightening Agents and the challenges these post on successful colour management

FieryForums.efi.com – Join the Fiery Forums and connect with a community of Fiery users and experts for information on best practices and answers to technical questions

Further information:
Electronics For Imaging, Zaventem, Belgium
tel: +32 2 749 94 20
email: david.lindsay@efi.com
web: www.efi.com

CREATING A WINNING COMBINATION WITH OPPOSING FORCES

Nancy Gray considers the technical issues when selecting the appropriate thread count for the screen mesh

Nancy Gray

It started with a direct request from a textile ink manufacturer at the peak of the high density fashion trend, which required thick ink layers (100 to 400 microns) with a single squeegee pass for heavy deposit special effects on T-shirts.

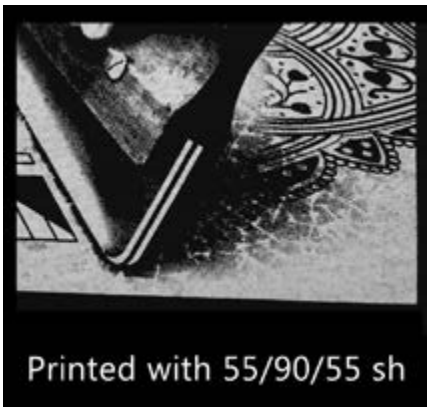
The initial technical issues to consider were the selection of the appropriate thread count for the screen mesh (83 threads per inch/38cm – 70micron thread) and the correct system to provide the necessary stencil thickness, generally achieved with capillary film and multiple, consistent, high (minimally 25-30n/cm) tension screens.

With these parameters in place, the next challenge was to determine the right combination of squeegee hardness and edge profile to provide complete transfer of this thicker ink into the mesh and stencil.

A common misconception is that the role of the squeegee is to push the ink through the mesh. In fact, the squeegee's job is to fill the mesh openings and the stencil beneath it, allowing for a complete transfer of the contained ink to the substrate as the screen snaps away from it. Different measures were undertaken to successfully achieve these results.

THE MOST SUITABLE SQUEEGEE

One possible solution for garment decorators was to use a harder rounded edge squeegee, commonly referred to as 'bull nose'. While it's true that the rounded edge will force more ink into the screen, it does so with an uncontrollable angle, placing excessive pressure on the screen and resulting in a loss of detail. This is less problematic when printing a thick ink paste in a uniform way with no clearly defined borders, but it is seriously limiting when printing a combination of a thick ink paste, well-defined lines, full flood stroke and higher press speeds.



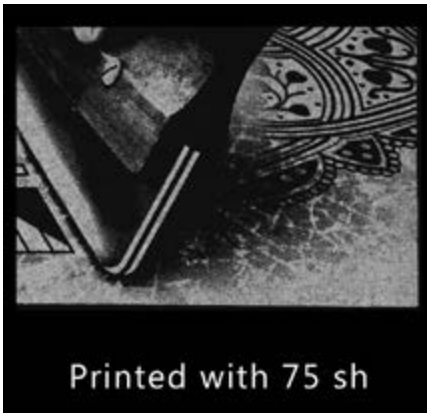
Example of printing with 55-90-55 sh squeegees

Another way in which some textile printers approached this problem was to print with a very soft squeegee, as softer squeegees will produce thicker ink deposits in solid areas. However, when using a very soft, single durometer squeegee and downward pressure is applied, the squeegee blade bends excessively. This bending of the squeegee under pressure forces more surface area of the squeegee blade closer to the surface of the mesh, reducing the optimum printing angle and preventing a clean, crisp 'snap-off'. This will result in loss of detail and incomplete clearing of the ink from the mesh and transfer to the substrate.

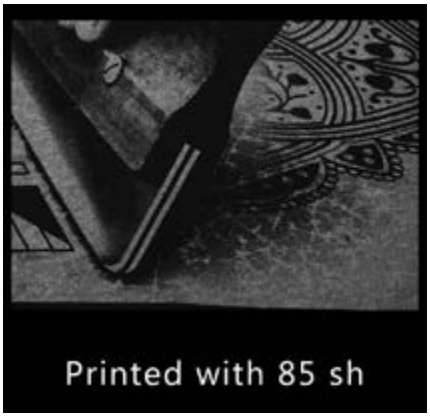
Example of printing with 75-90-75 sh squeegees

TRIPLE DUROMETER BLADES

At the other end of the spectrum, printing with a hard, straight edge squeegee, it is possible to achieve both fine details and high definition, but not without a resulting loss of coverage and opacity. Ultimately, it is really a combination of both soft and hard together that would be most successful in providing an acceptable result across the range of requirements. Triple durometer blades had already demonstrated successful results for many years in high-end industrial printing



Example of printing with 75 sh squeegees



Example of printing with 85 sh squeegees

operations, as well as on large-format screen-printing presses and even on high speed automatic T-shirt printers. A triple durometer squeegee resists bending during printing. Less pressure is required, providing a more controlled printing angle while minimising wear to the print edge while at the same time increasing squeegee life.

With the recent completion of successful new developments in low hardness polyurethane casting, Fimor was prepared to offer a better potential solution – a triple durometer squeegee with the powerful combination of a super soft 55sh for the external layers that would flex easily at the point of contact between the squeegee tip and the screen, in conjunction with a hard 90sh material for the inside layer, providing the necessary rigidity to resist 'roll-over' during printing. This represented a reduction of 10 shore to the outside layers of our pre-existing standard of 65/90/65sh.

SUCCESSFUL SAMPLES

Initial samples were sent to friend and textile consulting professional Charlie Taublieb. After evaluation and trial printing in both manual and automatic print shops, he became convinced that the 55/90/55sh squeegee was not limited to use with high density plastisol inks and gels, but included a variety of print applications.

These are some of the reasons he now regularly advises textile screen printers to use this blade:

- For a better ink deposit on the underlay white to improve brightness without loss of detail. This can be achieved as long as the printer does not apply excessive pressure which would cause the blade to curl.
- To get impressive results with a single pass on an automatic, and one to two passes on a manual, by slowing down the print stroke
- Recommended for use with foil adhesive by laying down the correct deposit of adhesive through an 86-110 (34-43cm) mesh screen, not requiring more than a single pass.
- Recommended for all water base printing including discharge because it allows the ink to penetrate the garment while still holding good detail. Use with 110-156 (43-60cm) mesh.
- Recommended as the front blade on a double squeegee in order to lay-down a strong deposit while holding detail, using only a single pass on T-shirts and a double pass on fleece for an exceptional underlay.

SUCCESSFUL RESULTS

After an initial launch as a special product, this hardness range has now become a standard in our line and has been tested and is successfully in use beyond its original target market of advanced textile printers. 55/90/55sh triple durometer squeegees are now being used in certain industrial printing applications that require thick and regular ink coverage with both solvent and UV inks.

When using a softer squeegee, please consider the following:

- A softer edge will deposit more ink than a harder edge. Thick ink deposits may create curing issues. Time, temperature and belt speeds will need to be adjusted accordingly.
- A lower durometer squeegee is likely to require more frequent sharpening as the edge will wear more quickly than a harder one.
- Within the same chemical formulation a softer polyurethane will be less chemically resistant than its hard equivalent and therefore may not be compatible with all ink series. ■

Nancy Gray is Technical Sales Manager at Fimor North America

Further information:
Fimor North America, Sarasota, Florida, USA
tel: +1 404 536 3521
email: ngr@fimor.fr
web: www.fimor.com

THE BENEFIT OF CAPILLARY FILM OVER DIRECT EMULSION

Larry Tywater asks can you really afford not to use it?

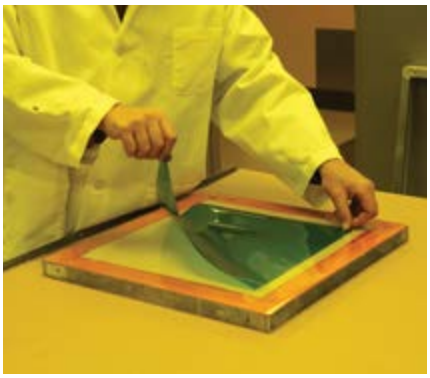
Anytime I suggest a customer should be using capillary film instead of direct emulsion their first reaction is usually the same. "That stuff is too expensive." Unless the customer is a high end graphic shop the benefit of using capillary film is usually dismissed for a variety of reasons. Generally the overriding reason is cost. It may be a little more expensive as a product, but the difference in quality and repeatability is unmatched. The most tangible difference that you will see is the savings in time. That said, you must determine what is that time worth?

SIDE BY SIDE COMPARISON

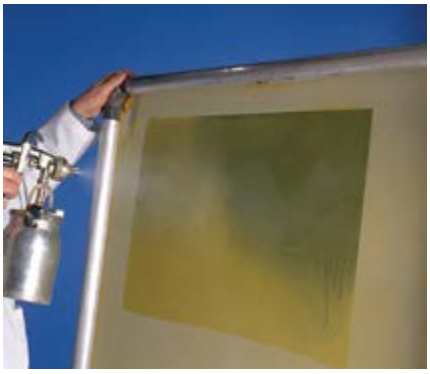
Direct emulsion, as we all know is a liquid emulsion coated onto a screen while in the liquid state. There are a lot of emulsions on the market today, from a pure photopolymer, dual cure, diazo, or a hybrid. You can use either an automated coating machine or do it manually using a scoop coater. Either way, you are simply loading the mesh with the direct emulsion. You can coat the mesh any way you like but keep in mind, your final coat must be on the squeegee side of the mesh so it forces the emulsion to the print side. This is the EOM and is what will create your 'gasket' which will determine print quality on your substrate. EOM stands for emulsion over mesh and means exactly what it says. It is the measured layer of emulsion that protrudes above the mesh on the print side of the screen.

Capillary film on the other hand is an emulsion that is coated by the manufacturer onto a polyester carrier. It is coated in different thicknesses to be used with specific mesh counts. Since the capillary action draws the film into the mesh you typically use thicker capillary film for lower mesh counts and a thinner capillary film for higher mesh counts. For instance, if you have a 50 micron capillary film and place it on a 110 mesh, after the capillary action is complete you should have about 15 microns of EOM. This means that 35 microns of the film was 'pulled' into the mesh by the capillary action. With direct emulsion you must coat multiple times to first fill the mesh. Only after the mesh has been filled can you then create EOM. Multiple coatings of direct emulsion can take a considerable amount of time especially on the lowest of mesh counts when you may end up needing to do face coats of emulsion. With capillary film you simply use the film thickness needed for a particular mesh. All capillary film manufacturers will have a mesh selection guide.

The roll down method for applying capillary film to the mesh



The capillary film contacts the screen, ending with the corner of the film being held



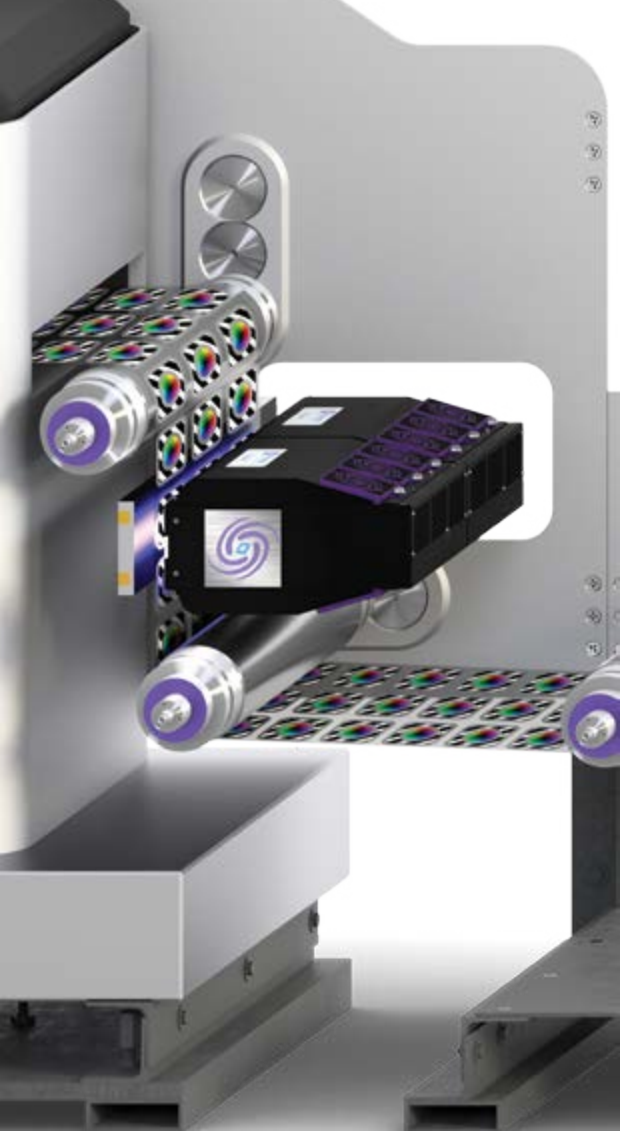
The sprayer, from the squeegee side of the mesh, saturates the film starting from the bottom

Continued over

Film Thickness	15 & 18 microns (0.6 & 0.7 mil)	20 microns (.79 mil)	25 microns (1.0 mil)	30 microns (1.2 mil)	38 microns (1.5 mil)	50 microns (2.0 mil)	70 microns (2.8 mil)
Mesh Count/Inch (per cm)	380 & finer (150 & finer)	380 & finer (150 & finer)	305 & finer (120-150)	205-305 (81-120)	205-305 (81-120)	205 & coarser (81 & coarser)	76 & coarser (30 & coarser)
Heavy Deposit	Not Applicable	Not Applicable	Not Applicable	Adequate	Good	Excellent	Excellent
Apparel/T-Shirts	Halftones	Halftones	Halftones	Solid	Solid	Puff	Puff/Glitter
Four Color Process (per cm)	up to 150 line (59)	up to 150 line (59)	up to 120 line (47)	up to 100 line (39)	up to 100 line (39)	up to 100 line	Not Applicable
Banners	Adequate	Adequate	Excellent	Excellent	Good	Good	Good
Posters/Signs	Adequate	Adequate	Excellent	Excellent	Good	Good	Good
Decals	Excellent	Excellent	Excellent	Excellent	Good	Good	Not Applicable
Solder Mask	Not Applicable	Not Applicable	Good	Excellent	Good	Good	Adequate
Primary Imaging Nomenclature	Adequate	Adequate	Excellent	Excellent	Good	Good	Not Applicable
Bottles/Containers	Excellent	Excellent	Excellent	Excellent	Good	Good	Not Applicable
Glass Decorators	Excellent	Excellent	Excellent	Excellent	Good	Not Applicable	Not Applicable
Ceramic Decals	Excellent	Excellent	Excellent	Excellent	Good	Not Applicable	Not Applicable

XXX= excellent resistance XX= moderate resistance X= some resistance 0= no resistance

Capillary film mesh recommendations



Dear Printer,

I can offer you higher yields and increased revenue.

Sincerely,

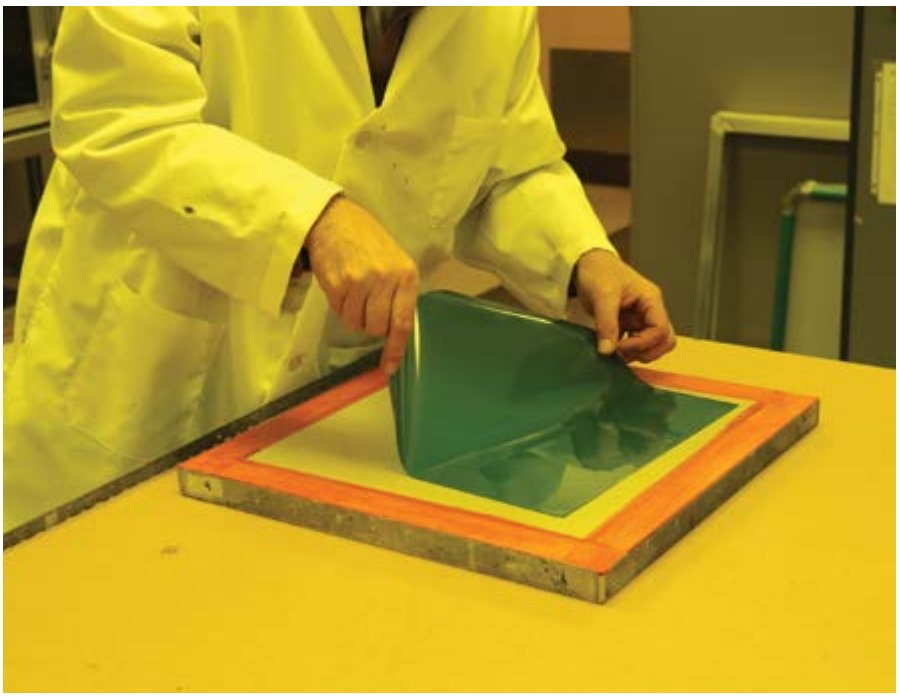
LED CURING
by Phoseon

Phoseon™ TECHNOLOGY
The Leader in LED Curing

- Proven Reliability
- Superior Performance
- Innovative Technology

www.phoseon.com/landing/uv-printing

The film is reverse rolled with the emulsion side out



The drop on method is easiest on small sheets

As in any shop, time is very expensive as well as personnel. For some people learning how to coat a screen correctly with direct emulsion can take days, weeks or even months to become proficient. With capillary film it is possible to master mounting the film in less than 15 minutes. Training personnel is a snap and the end result is the same no matter who applies the film – consistent high quality screens every time!

Advantages of using capillary film;

1. Repeatable and easy to master.
2. Very durable stencil.
3. Best edge definition and sharpest lines.
4. Zero pinholes.
5. Totally reclaimable.

If you track the time it takes for the complete process of preparing a screen from start to finish with direct emulsion vs capillary film, the capillary film will win every time. Whenever you can save time and still produce a high quality stencil you win.

DIFFERENT WAYS TO APPLY CAPILLARY FILM

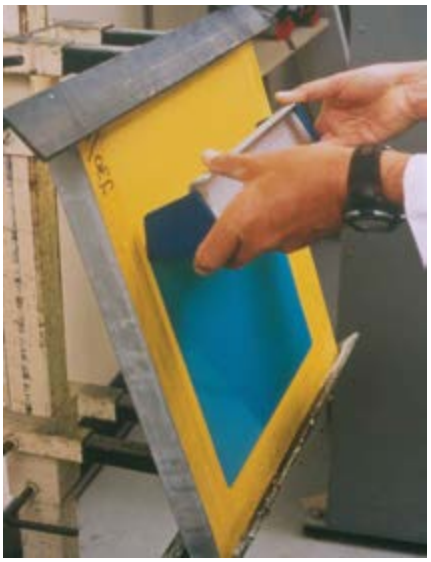
There are several different ways to apply capillary film to the mesh. The three methods that I teach are as follows – roll down method, spray gun method, and drop on method. All three of the methods start out with first degreasing the screens that are to be used. With all of the methods the film should go on with no air pockets or bubbles and should be a smooth and defect free coating on the mesh.

THE ROLL DOWN METHOD:

Have a cut sheet of film ready to place on the screen. While the screen is still in the sink and wet you may want to apply a wetting agent for the roll down method only. The wetting agent actually changes the surface tension of the screen making it hold more water. This will aid in the even application of the capillary film. Reverse roll your film with the emulsion side out in your hands. After that is done place the rolled up film at the top of the print side of the screen and 'roll' it down. Next, squeegee off the excess water from the squeegee side only and allow the screen to dry print side up.

SPRAY METHOD:

Use an air driven sprayer that ionises the water when activated. Spray a miniscule amount of water onto the print side of the dry screen. Place your cut sheet of capillary film onto the print side of the mesh and the small amount of water will hold it in place. Then use the sprayer, from the squeegee side of the mesh saturate the film starting from the bottom and working your way up. This will cause the capillary action to take place and the film will be 'pulled' into the mesh from the print side. You then simply squeegee off the excess water from the squeegee side of the screen only and let it dry print side up.

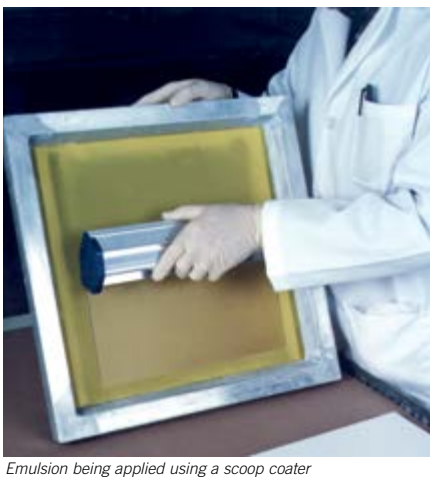


Learning how to coat a screen correctly with direct emulsion can take time

DROP ON METHOD:

With the screen still wet, lay it down flat with the print side up. You then take your cut sheet of capillary film and hold it by a single corner between two fingers. Place it on the screen starting at one corner. With a single smooth and fluid motion, allow the capillary film to contact the screen ending with the corner of the film that you are still holding. This method is easiest on small sheets but, once mastered, it is the fastest way to apply the film.

Continued over



Emulsion being applied using a scoop coater

CLEANLINESS

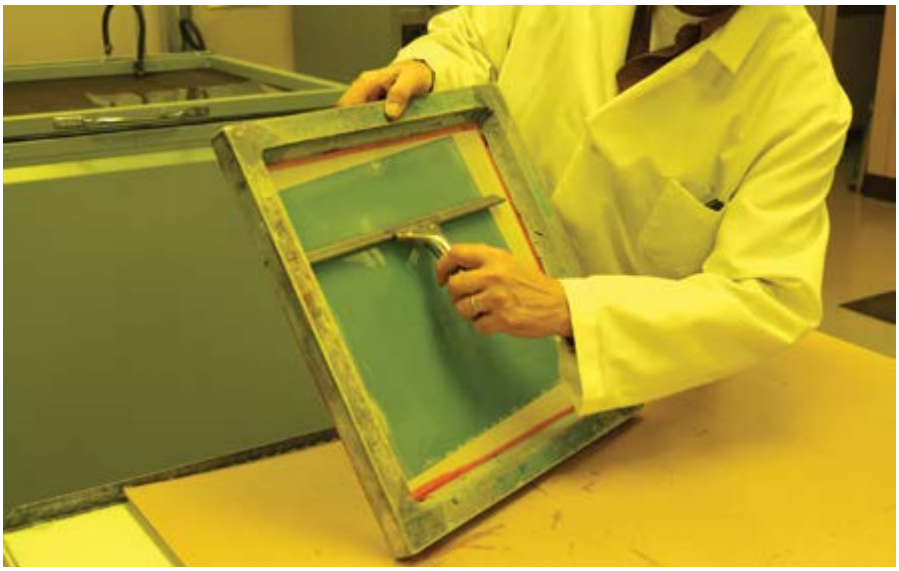
The ease of use and cleanliness of using capillary film is night and day from liquid emulsion. With liquid emulsion you are have to deal with pouring from a container into coating trough. You then must coat the screen and watch for drips or runs that are always a part of coating. You must be ever vigilant not to tip the coater while not paying attention causing you to spill and drip emulsion all over the floor. (We have all done this!) If you have an automatic coater there is always the layer of stalagmites that begin forming underneath the trough holders. As we all know, with liquid emulsion you are going to spill some.

Capillary film on the other hand is much cleaner and user friendly. You are generally dealing with cut sheets that fit exactly onto your screens. You are also dealing with clean water to apply the film. You are using a squeegee to remove the excess water from the screen after the film is applied. Once the screens are placed into the rack, the drying time for the capillary film and the screen is usually about one-quarter of the time it takes to dry a screen with direct emulsion. The drying time plus the clean-up time that you are no longer involved in will speed your process up by a minimum of 50%.

PROPER EXPOSURE

Proper exposure for many seems to be as elusive as Bigfoot! People spend their days preparing screens and, when it comes to exposure, they chase it like an elusive creature. A lot of times when I ask a customer how they came up with a particular exposure time they simply say: “This is the way that the guy that I replaced trained me.” Well, that guy could have been a maniac or he could have known that you were about to replace him and feed you bad information. It is always best at least to understand the basics of proper exposure so that you are capable of reaching that proper exposure alone. In very simple terms proper exposure is when the emulsion that received 100% of unfiltered UV light has cross-linked, and the only unexposed emulsion on the screen is what was ‘hidden’ by your positive or negative image.

All three methods of applying capillary film require degreased screens



With capillary film it is possible to master mounting the film in less than 15 minutes

REPEATABLE EXPOSURE

When using capillary film the EOM is always the same on any particular mesh count. That is because the capillary action will draw the film into the mesh the same every time and is always constant. You should have a light integrator on your exposure unit. This will assure that your screens get the same amount of UV energy because the light integrator will compensate for the age of the bulb. You will no longer struggle with holding half-tones or having to deal with under or over exposed emulsion once you get your times set properly.

The drop on method for working with capillary film

PRINT QUALITY

When you are trying to achieve great print quality there are a few things that must line up in order for you to achieve that. I will put these in order of use as I believe all are equally important when it comes to a quality screen.

1. Properly tensioned and clean mesh.
2. Quality film positive with a 3.0 density reading or above.
3. Proper EOM for a particular mesh count.
4. Proper exposure for the mesh type and emulsion that you are using.
5. Proper washout after exposure.

If any of the above is lacking then that is the weak link in your process from a quality point of view. It doesn’t matter how good your artist is or how proficient your printer is, your print quality will suffer if any of these are not 100% accurate.

After looking at all the variables, using capillary vs direct emulsion is no contest from a quality and ease of use standpoint. Capillary film is the much more precise way to go if you are trying to achieve the best possible screen, reproduce the best possible image and keep a clean screen room all at the same time. If you take into consideration all the prep time that you use for direct emulsion, refilling the troughs, clean-up and dry time. The capillary film will win hands down. How many times do you have to re-burn a screen because it has pinholes or you are not holding detail in the image? How much time and money is actually spent on the re-burning of screens? That is a question that I will leave for you to decide. ■

Larry Tywater is Technical Sales Representative at Chromaline

Further information:

Chromaline Screen Print Products, an IKONICS Company, Duluth, Minnesota, USA
tel: +1 218 628 2217
email: ltywater@chromaline.com
web: www.chromaline.com

E.T&H BSW 379.302.001

Gallus Rotascreen: give your products that sensual touch

The recipe for greater, faster success: Gallus Rotascreen. With rotary screen printing, your labels become truly eye catching, point of sale decision tools. Add to this the option of combining screen with flexo, letterpress and offset and you really do open up whole new dimensions for your customers' products in the simplest way possible, because Gallus rotary screen can easily be integrated into all new or existing machine systems. From film to finished stencil you are ready to print in under 30 minutes!

gallus

Success and security for the labelprinter

Gallus Ferd. Rüesch AG
Harzbüchelstrasse 34
CH-9016 St.Gallen
Phone +41 71 242 86 86
Fax +41 71 242 89 89
www.gallus.ch

A partner of Heidelberg

SEFAR® **PME**

The best performing screen printing mesh

Functional layers and conductive paths in highest quality printed with SEFAR® PME 130/330-30Y

In the fast lane with the highest efficiency and quality printed with SEFAR® PME 110/280-35Y

Clear and durable signs and inscriptions printed with SEFAR® PME 150/380-30Y

© Danielson Europe BV

Sefar AG
Hinterbissaustrasse 12
9410 Heiden – Switzerland

Phone +41 71 898 57 00
Fax +41 71 898 57 21

printing@sefar.com
www.sefar.com

SEFAR

ACHIEVING ACCURATE AND CONSISTENT COLOUR IN DIGITAL PRINTING

Wolfgang Passler describes the relevance of process control

INTRODUCTION

This article is intended for professionals in the digital printing industry who require a RIP independent solution to achieve accurate and consistent colour. It explains process control in digital printing and addresses the current shortcomings.

WHAT IS PROCESS CONTROL IN DIGITAL PRINTING?

Process control in digital printing is a series of actions which ensures output meets expectation by managing variables which can impact production. The main objective is to ensure accurate and consistent colour reproduction by creating a tailored solution for each printer and media combination.

Even with readily available innovations, the shortcomings of current practice in process control include tedious manual labour, inaccurate guesswork and wastage due to unseen changes to printing conditions.

Using technology, such as the Barbieri DOC Process Control Solution which incorporates leading edge methods for process control, ensures accurate and consistent results for optimal performance and saving costs.

CHALLENGES IN DIGITAL PRINTING

Digital printing professionals must ensure colours are accurately reproduced. As technologies evolve and demands change, digital print volumes are increasing. Digital printers will increasingly need to cater to a range of different substrates, evolving imaging technologies and inks.

Without process control, businesses can be impacted by:

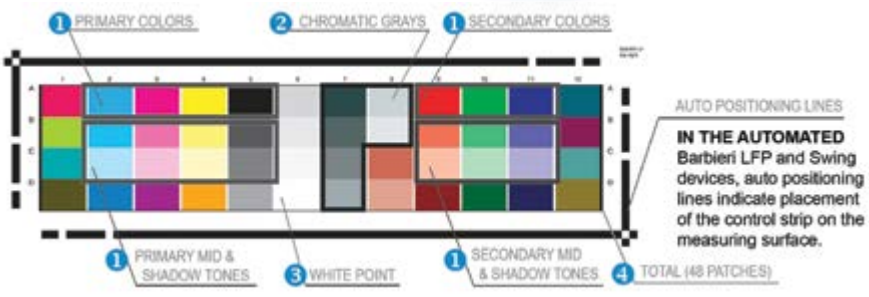
- Production downtime.
- Wasted ink and media.
- Shipping, application and removal costs.
- Damaged client relations and reputation.
- Lost revenue and missed opportunities through lack of competiveness.

On a day-to-day basis, changes to printer conditions can go undetected, occurring if there is any change to temperature and humidity, substrate and ink.

STANDARD PRINTING WORKFLOW

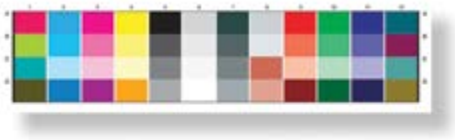
The workflow for printer configuration involves selecting a printer configuration and material combination. Calibration and profiling are then performed. The verification process then analyses if printing conditions have changed. Measurements are made on a control strip, generating a quality report and enabling evaluation over time and in multiple locations.

The Barbieri SpectroPad including DOC option on Barbieri's DOC



Barbieri DOC operates with an industry compliant, proprietary control strip

1. SETUP
Print and measure a control strip.
This printer/media combination is auto saved as a reference file.



2. DAILY CHECK
Select the saved reference and measure the control strip.

3. REPORT
Results shown on device or PDF.

Most process control solutions are based on three steps

Colour measurements in each of these steps has to be made after eventual post-treatment in order to ensure colour accuracy on the final product. Just for verification, a measurement immediately after the printer can make sense, in order to discover variations on just the printing process.

WHAT ARE THE BENEFITS OF PROCESS CONTROL IN DIGITAL PRINTING?

Improving process control has a range of benefits in digital print production:

- Assesses print conditions daily, before production starts.
- Eliminates the need to cut large format media (using a portable device).
- Processes measurements on the spot (using a portable device).
- Enables production to be monitored over time and in multiple locations.
- Uses a benchmark, or initial reference file, to determine printing conditions.

HOW DOES PROCESS CONTROL IN DIGITAL TEXTILE PRINTING WORK?

Most process control solutions are based on three steps (here shown on the example of Barbieri DOC Digital Output Control).

1. Set-up: create and save a reference file

Set-up is only performed once for every printer/media combination. After calibration and profiling, a control strip is printed on the selected media. This control strip is measured using a suitable spectrophotometer. A reference file is automatically created and saved as a pre-set, based on the selected printer/media combination. Alternately, an external 'absolute' reference such as FOGRA or IDEAlliance can be used.

2. Daily check: print and measure control strip

This check is performed daily, before production starts. It is based on the saved reference file created during setup. A control strip is printed on the media. In the device's DOC option, the saved job with the reference file for the printer/media combination is selected. The control strip is measured within seconds for an instant pass/fail result.

3. Report: instant pass or fail results

Results are instantly displayed as pass or fail on the device screen (when using the Barbieri SpectroPad) and also saved as a PDF. The generated report shows the printer/media combination, reference used, tolerance sets and values. This data can be transferred via WiFi or USB to monitor printer performance and quality control.

THE REFERENCE FILE AND REFERENCE PRINTING CONDITIONS

A basic requirement for colour measurement is a reference file. This reference file uses the defined printer/media combination to match measurements made on a control strip. Reference printing conditions use a characterisation data set to match data to the printed output. This characterisation data set is based on the required measurement mode (eg. M0, M1 or M2) and measuring conditions such as illumination (eg. D50), media backing and observation angle (eg. 2°).

ABOUT THE CONTROL STRIP

Barbieri DOC operates with an industry compliant, proprietary control strip. It also supports the FOGRA wedge, IDEAlliance and custom strips.

The control strip is a set of patches which meet ISO requirements. The ISO standard recommends a 48 patch minimum, including solid process primary and secondary colours, their mid and shadow tones and greys.

CONCLUSION

Digital printing professionals require a process control solution to achieve accurate and consistent colour. This is especially important given the current and forecast growth of the digital printing industry.

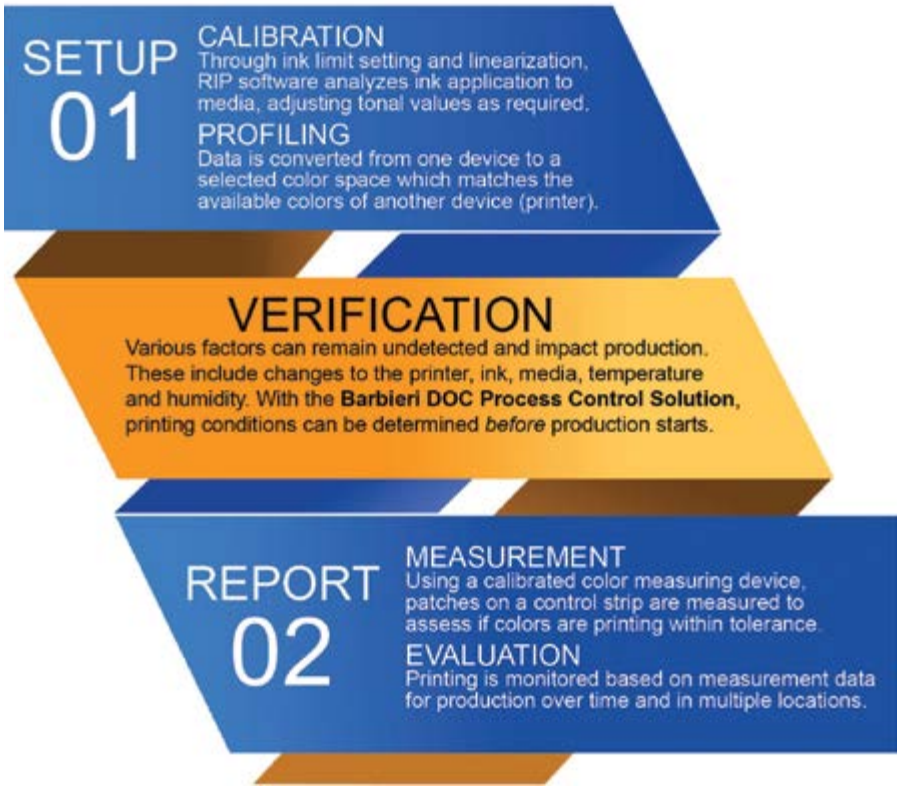
As innovations and production techniques evolve, the guidelines for process control for digital printing also evolve. Outdated practices and limited technologies affect production and revenue by causing printer downtime and wastage. Unseen factors unnecessarily impact production.

The Barbieri DOC Process Control Solution is cost effective and easy to use. It offers flexibility with media types and evaluation methods, customisation and instant results. It was devised to address the shortcomings of current practice in process control based on client experience, innovations from international industry bodies and internal research and development.

A process control solution which is cost effective and delivers optimal production is the Barbieri SpectroPad including Barbieri DOC.

Barbieri is an internationally operating manufacturer and supplier of intelligent color measurement systems which ensure the highest image quality for professional digital printing. The international Barbieri technical laboratory continuously discovers new features, characteristics and applications to improve products and assist clients for improved performance.

This article is based on a white paper written by Tanja Polegubic during an internship with Barbieri Electronic as a research component to the Master in Color Design & Technology (first edition) from the Politecnico di Milano, Italy. ■



Barbieri's standard printing workflow

Wolfgang Passler is Vice President International Sales & Marketing at Barbieri

Further information:

Barbieri Electronic, Bressanone/Brixen, Italy
tel: +39 0472 834 024
email: wp@BARBIERIelectronic.com
web: www.BARBIERIelectronic.com

THE LAWS OF PHYSICS IN SCREEN-PRINTING

Professor Steven Abbott explains why fighting science is a bad idea

It is never a good idea to fight the laws of physics, especially when your business success depends on producing the highest quality product with great control of what is going on in the process. So it has always seemed to me to be especially sad that the world of screen-printing has been so slow to adopt the rather straightforward science behind screen-printing and continued with a set of myths which, collectively, say "screen-printing is an art, not a science".

The science was worked out more than ten years ago by myself, my colleagues at the University of Leeds in the UK and other industry experts. An outcome of this research was the book I co-authored in 2008 (freely downloadable from www.stevenabbott.co.uk/_downloads/How%20To%20Be%20A%20Great%20Screen%20Printer.pdf), 'How to be a great screen printer' which showed that, when done properly, the three key elements of the process work independently, which is always best for optimal control.

1. The mesh does the metering – i.e. the amount of ink deposited is (or should be) controlled by the mesh. Providing extra ink from the stencil is possible if you know what you are doing but, in general, a thick stencil causes many more problems than it solves.
2. The stencil defines the shape of what is to be printed. Asking the stencil to do just one job means that all your stencil-making efforts can go into creating the thinnest, sharpest shape with the least amount of trouble.
3. The ink delivers its functionality – colour, conductivity, solar energy conversion. Printers who don't follow the laws of physics find themselves asking the ink to do other jobs such as fix problems with their mesh or stencil. This always means a compromise from the prime mission of the ink.

SQUEEGEE FUNCTION

Note that the squeegee doesn't appear in those three key functions. The squeegee should be entirely neutral in terms of metering, shape and functionality. It does just three things and should be optimised for those things only.

1. Press the mesh/stencil into good contact with the substrate.
2. Fill the mesh with ink.
3. Scrape off any excess so that the mesh is defining the volume of ink to be printed, rather than relying on, say, a slight excess above the mesh from an almost-out-of-control squeegee.

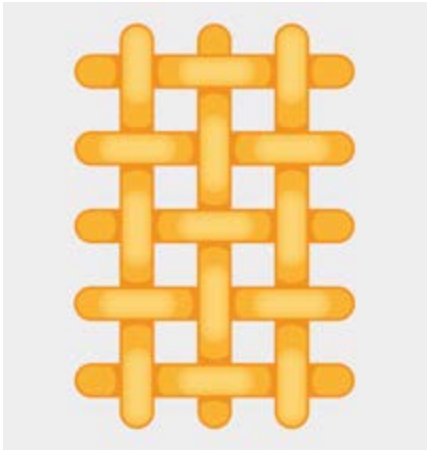


Figure 1: the square shape that is said to define the ink volume

Squeegee manufacturers have developed a wide range of squeegees to suit the many different configurations required to meet these three functions. If there are readers who still think that the squeegee does the printing, the proof that it has no role in the printing is simple and obvious. The printing only happens when the mesh rises from the substrate and this can only happen when the squeegee is far away from the printed region. And, for those who worry about how the ink comes out of the mesh, the answer is that it doesn't. Instead the mesh comes out of the ink – what else can it do?

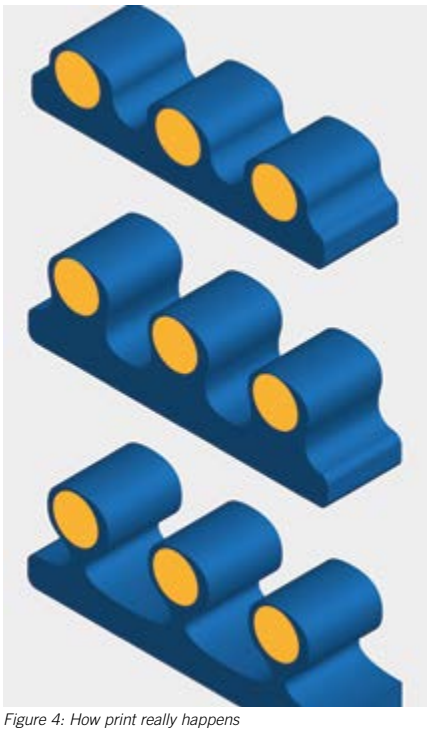


Figure 4: How print really happens

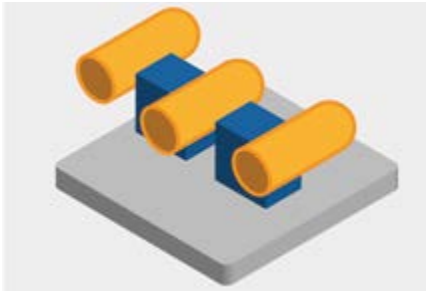


Figure 2: how printers think the ink is printed

Figure 3: the complex shape of a real mesh

THE PERFECT MESH – MYTH VS REALITY

For those who have chosen not to fight the laws of physics, the choice of mesh becomes very simple. It must deliver the required volume of ink (its positive function) without interfering with the stencil's ability to do its job of defining the printed shape.

At one time some mesh manufacturers offered meshes with a special treatment that would "deliver more ink". This was both scientifically impossible and experimentally wrong. Their demonstrations showed water going more quickly through a pure mesh, with the implication that the same thing would happen with the ink. Anyone who has touched a mesh immediately after the first print knows that the mesh is covered with a thin layer of ink. This means that whatever treatment was on the surface of the mesh was no longer

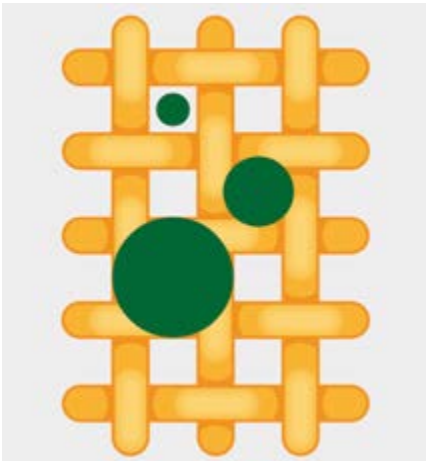


Figure 5: meshes cannot do the impossible, but they must allow the finest-possible features to be imaged

visible to the ink, so it could have no effect on ink deposit. Why did these manufacturers convince themselves that the treated mesh delivered more ink? That's an interesting story which we shall come back to shortly.

If the mesh is the primary control of the ink deposit, how much ink will a given mesh deposit? Regrettably even the best mesh manufacturers have kept going with yet another unhelpful myth, so this important question is given the wrong answer.

LOTS OF INK GETS LEFT BEHIND...

The standard myth makes intuitive sense. Looking down through the mesh you see effectively a square cross section of ink; multiply that by height and you have the ink volume that is always quoted. It then seems obvious that this is what gets printed. Printers imagine the print looking something like a rectangle of ink printed between the mesh fibres. Simple!

Yet elementary geometry allows you to calculate the real volume of ink that is contained in the complex shape which is very different from the cuboid assumed in the standard approach.

If you calculate (or measure) the volume of ink in the mesh it is significantly higher than the standard calculation and higher than the amount that is printed. What is going on? The laws of physics mean that when the mesh comes out of the ink (remember, the ink doesn't come out of the mesh) the ink must flow around the mesh, always creating a nice meniscus. When you follow this in any reasonable computer model you find that the largest deposit of ink is precisely underneath the mesh fibre – something that can easily be checked by looking at a print under a microscope [figure 1].

So there is no question of a cuboid of ink being printed in the open area which then has to flow out to join up later. But the same physics means that plenty of ink remains around the mesh – it's the same physics which says that taking a spoon out of honey leaves plenty of honey on the spoon. Ask most printers how much ink remains on the mesh and they will say, perhaps, 1µm, a very thin layer [figure 2]. In fact, it is many µm and about 30% of ink that was in the mesh remains on the fibres after printing. Again this is easily measured and it is also well-known that a print immediately after the last flood/squeegee/print stroke (i.e. a print without the flood) gives quite a strong image so there must be plenty of ink remaining on the mesh [figure 3].

What this means is that the printed ink volume is "ink in the mesh at the start" minus "ink in the mesh at the end" [figure 4]. As it happens, for many meshes this volume isn't far from the cuboid volume that is regularly quoted. But the point is that the industry should be regularly measuring the "before" and "after" values to better understand what is going on. All meshes are not equal and subtle details in the weave and in the compression/ovality of the mesh can make a significant difference to the end result.

It turns out that those treated meshes that sometimes gave a larger print volume had settled down slightly differently when stretched onto the frame so the amounts of ink at the start and the end were different. Happily the fad passed, but it is sad that the technical and marketing efforts to pursue this delusion were not spent on issues that are of deep importance to the demanding screen-printer.

PRECISION MESHES CAN DELIVER BETTER PERFORMANCE

Until the industry recognises the value of using the correct approach, those who need great control of printed volume need meshes that are woven with the highest precision (that is obvious) but which also keeps that precision when stretched. This is the hardest part of the weaver's craft and I admit to not knowing the physics involved because it is a very complex interplay of many factors. One key element of choice of mesh is how well it preserves the precision of the original weaving. The best original mesh that then distorts uncontrollably on stretching is of little use to the precision printer. So the optimal supplier will have a deep appreciation of the impacts of the processing and treatment of their mesh on these downstream steps.

The mesh has three more tasks to perform, all related to the stencil's role. Because the ideal in screen-printing is a complete separation of

Continued over

functions, a good mesh cannot improve the stencil's role but a bad mesh can make things far worse. Here are the three tasks:

1. Support the stencil, allowing it to exactly reproduce the required image.
2. Provide the minimum interference for the ink with respect to the stencil shape.
3. Keep the original dimensions from the moment of imaging of the stencil so that registration remains as perfect as possible.

No mesh can do the impossible – it cannot support a dot of stencil located directly above a hole in the mesh [figure 5].

So there are obvious limitations to the finest feature size. The ideal mesh then helps the stencil in two ways. First by not interfering in the UV imaging process. A perfectly transparent mesh would provide the minimum interference but in the world of polyester mesh this seems not to be possible. Therefore, the mesh needs to absorb any UV light that gets through the stencil so that it doesn't get scattered sideways and reduce the resolution. Although all mesh manufacturers can produce the necessary yellow or orange UV absorbing mesh, the best manufacturers introduce the colour in a way that is non-hazardous, non-polluting and which doesn't harm the key mechanical properties that have been built in to the mesh fibres during their manufacture.

PLASMA TREATMENT FOR IMPROVED ADHESION

The key technological leap forward in recent years addresses the second way by which the mesh helps the stencil. Smart plasma pre-treatment of the fibre surface allows strong adhesion of the (hydrophilic) stencil to the (otherwise hydrophobic) fibre. With a welcoming fibre surface, the stencil material can be optimised for other properties without requiring compromises that also deliver strong adhesion to the mesh. Although it is relatively easy to create a 'plasma treatment' to render the surface hydrophilic, it is much harder to do so without compromising the strength of the fibre. Plasma can easily destroy the top few nm of a fibre and therefore weaken the fibre. It is also hard to provide a treatment without compromising the stain-resistance of a fibre. Plasma can all too easily open up the surface to the ingress of dyes and pigments from stencil and ink, and a stained mesh often reduces the print quality on re-use.

In terms of interference with the ink, as discussed above, the fibres in the open areas of the print cause no significant problems. The key problem is when the stencil edge coincides at a slight angle with the mesh.

As the image shows, this can cause a significant reduction in print accuracy [figure 6]. The only way to reduce the problem is to use the thinnest possible mesh. For those who prefer to use stainless mesh the move down to 13µm threads has enabled excellent fine resolution. For those who prefer to use polymer mesh the issue isn't simply one of using the thinnest, strongest possible fibre. Liquid crystal polymer fibres offer desirably high strength along the fibre. The problem is that the strength across the fibre is seriously compromised. This means that the forces within the woven fabric cause the fibres to squash into a highly elliptical cross-section, providing a significantly higher chance of an image-blocking interaction between the stencil edge and the fibre. Polyester fibre has less strength in the longitudinal direction (a disadvantage) but much higher strength in cross-section so is far less elliptical and therefore enables higher-resolution printing. This issue is a key reminder of the need for mesh manufacturers to understand the true ink volume from the 3D shape of their woven fibre and to ensure that they choose fibres that provide the optimal balance of strengths in the two directions [figure 7].

CORRECT WEAVING, PROCESSING AND MORE PHYSICS!

This brings us to the reason for the fibre to have maximal strength along its length. Meshes have to be stretched to a modestly high tension for many reasons, including clean snap-off for high quality prints. The tension can then cause the polymer to 'creep' both over time (relatively slowly) and under the dynamic action of the printing process (relatively faster). Any creep reduces the possible registration accuracy, and therefore limits the capabilities of complex prints. As discussed in the previous section, for polymer fibres greater strength along the fibre to reduce creep results in a lower strength across the fibre which reduces ultimate print resolution. And even the strongest practical polymer fibre cannot be strong enough below a certain diameter (~30µm), so they provide a poorer resolution limit compared to the thinnest stainless mesh.

It is important to note that two polyester meshes of the same diameter can have significantly different performance under tension. The fibre itself might be of lower strength (modulus), tending to give greater creep but, just as important, is what happens during weaving and processing. The creep of a mesh under steady load is one thing, the creep under the cycles of screen-printing depends strongly on how well (or badly!) the mesh fibres have been brought together during the mesh manufacture. The best meshes have the right surface properties and the right fibre-fibre compaction to minimise slippage under tension. As mentioned above, a poor plasma treatment might compromise the strength of the fibre. But the treatment will also affect (for better or worse) the ability of the woven fibre to be maximally creep-resistant.

There is one more way that the mesh influences the registration and it often surprises people. Polyester mesh is, of course, hydrophobic. However, it absorbs small amounts of water and will expand by 15µm/m

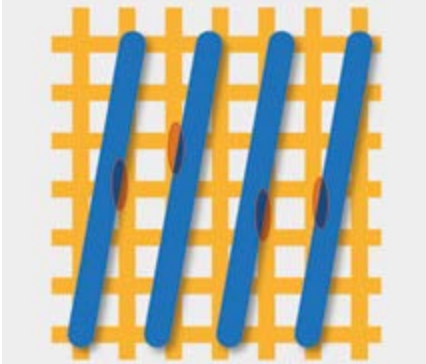


Figure 6: missing parts of the line in highlighted areas

for every 1% increase in RH. This is a small amount, but it is enough to lower the tension of a mesh by a few N/m between wet and dry states and that, in turn, implies a change of dimensions that could affect registration.

IT'S ALL DOWN TO THREE FACTORS

Having reviewed the physics, we can now reach some clear conclusions about choosing the right mesh. Surprisingly, these conclusions start with the ink and the stencil.

CHOOSING YOUR INK

If you have the best stencil and mesh then the ink does not have to cover up for their faults and can be optimised for colour and/or functionality. This is a great enabler for higher-quality printing. Many inks are seriously compromised by having to help those who don't know how to print correctly. A partnership with an ink supplier who knows that you are using the right stencil and mesh combination will give

Figure 7: the 'same' diameter mesh becomes more elliptical going from stainless to polyester to liquid crystal

you a simpler, no compromise ink which delivers superior performance where it matters.

CHOOSING YOUR STENCIL

The recipe for a perfect stencil is simple: the thinnest possible thickness (EOM) with the minimum Rz. Achieving that combination is a topic for another article. But given an excellent mesh with great adhesion and minimum light scatter, the stencil supplier doesn't have to compromise to cover up other defects and you can readily get a capillary film or a wet-on-dry emulsion which delivers the optimum performance.

CHOOSING YOUR MESH SUPPLIER

First you have to choose whether you want stainless, liquid crystal or polyester mesh. The choice of suppliers is limited for the first two. Here the discussion is about the choice of high quality polyester mesh for high quality printing.

For best uniformity of ink deposit you need a mesh with uniform 'ink in the mesh at the start' and 'ink in the mesh at the end'. As both factors depend on the subtle details of the mesh, the precision of the weaving and the accuracy of the post-processing are vital. A manufacturer, like Extris, who has a deep knowledge theoretically and experimentally about both aspects is likely to have a better grasp of, and control over, other aspects of producing the optimum mesh for your needs.

For high resolution you need the finest practical mesh with the least scatter and the right balance of yellow/orange absorber, with a plasma treatment that provides excellent adhesion to your preferred stencil material which, being as thin as possible, provides the maximum resolution, and, being as smooth as possible, provides a flat profile beneath the mesh to give optimal print acuity.

But these essential properties must be associated with low creep/distortion under the reasonably high tensions of modern printing. This means that the original fibre has to have been sourced for optimal tensile strength without being compromised by the dying and plasma treatment processes.

DON'T JUST RELY ON THE PACKAGE

Finally, your customers are demanding that you can prove your green credentials. A technically optimal ink, stencil and mesh combination will give you more 'right first time' prints and therefore lower waste. But you also need to know that your mesh has a green track record in production and poses no risk. For example, the Oeko-Tex certification ensures that any fabric that may come into contact with human skin is completely safe and doesn't release harmful chemical substances. By using such a mesh you have one extra piece of evidence to show to your customers that you care.

There is no way you can judge this package of capabilities just from manufacturers' specifications. It needs a close partnership where these issues are discussed openly and with good data. Any manufacturer who cannot discuss all these issues, and who doesn't have data to back up their claims, is unlikely to deliver what you need. A knowledgeable supplier will be able to discuss all the options with you. For example, a thicker fibre should (other things being equal) reduce creep and enhance registration, but it will also reduce the ultimate resolution of the print. Only you know which aspect is the more important and a good mesh supplier should have the technical knowledge to help you reach the right balance.

Above all, remember to work with a supplier who knows that fighting the laws of physics is a bad idea. ■

Acknowledgements: images reproduced with kind permission of Extris.

Professor Steven Abbott is a consultant at Extris.

Further information:
Extris srl, Colverde, Italy
tel: +39 031 22 80 96 0
email: info@extris.eu
web: www.extris.com

NEW MANUFACTURING PROCESSES AND ALL-IN-ONE SOLUTIONS

Andreas Künkele observes today's industrial screen-printing applications

Optical or functional printing – industrial screen-printing offers an amazing diversity of versions for both of them! Classical graphic screen-printing has already gone through a technological transition and reinvents itself over and over, especial in industrial applications.

In industrial applications, screen-printing can totally unfold its strengths, in terms of the variety of applications, rationalisation possibilities and the individualisation of printing and coating processes, which integrate the screen-printing technique into existing production processes. This offers totally new and unsuspected manufacturing processes and all-in-one solutions.

There are many examples:

In the automotive industry, you can find printed cylinder head gaskets, speedometer displays and rear window heating units. However, manufacturing printed circuits, solar cells, and SMD letterings for the electronic segment form an important part of industrial screen-printing. In the domain of electronics and photovoltaics, KIWO's photoemulsions AZOCOL Z 170 FL and AZOCOL S 305 FL have proved especially successful – two high-end emulsions, which are applied where highest resolution and edge definition are needed. FL stands for fine line, i.e. very high resolution of 30 µm and less.

SCREEN-PRINTING IS EVER-PRESENT

Even in household equipment, screen-printing is ever-present. The furniture industry creates surface structures (e.g. wood grain, finishing of tiles, optical or haptic effects) by screen-printing. Not to mention direct printing or transfer printing onto hollow glass, partial lacquering and finishing of printed materials of other printing processes, or the beverage industry (e.g. printing of crates).

The surface of readily manufactured parts is frequently protected with partial or all-over coatings that have been produced by screen-printing: A special task for KIWO's KIWOMASK portfolio, it offers resists and coatings for etching, sand blasting, brushing and protecting diverse materials and is a new and very interesting technical field that offers many possibilities.

Another typical field in industrial screen-printing is the application of adhesives. KIWO offers the suitable solution for the equipment of self-adhering parts in the automotive or electronic industry (e.g. membrane keyboards, optical displays, front panels) with highest demands to the adhesion. They manufacture heat-activated dispersion adhesives for laminating film and the packaging industry, e.g. bank and credit cards, as well as blister packaging. Beyond that, KIWO offers specialised systems, such as a screen-printable, anisotropic conductive UV-adhesive, suitable for many kinds of applications (e.g. connecting flexible and rigid circuit boards, shielding EMC/RFI or producing keyboards).

In terms of industrial screen-printing, the company Kissel + Wolf GmbH offers in the first place the chemicals and, beyond that, the technical support in stencil making for the respective industrial application. KIWO is always happy to verify users' individual requirements and its newest products will be on show at Drupa, Hall 3, booth B 71-1. ■

Ceramic relief printing with CERACOP HV

KIWOTHERM D 123 is suitable for the production of bank and credit cards

KIWOMASK S 150 screen-printable protective film for partial or all-over protection of sensitive surfaces

This solar LED torch benefits from high resolution and edge definition with KIWO emulsions, AZOCOL Z 170 FL and AZOCOL S 305 FL

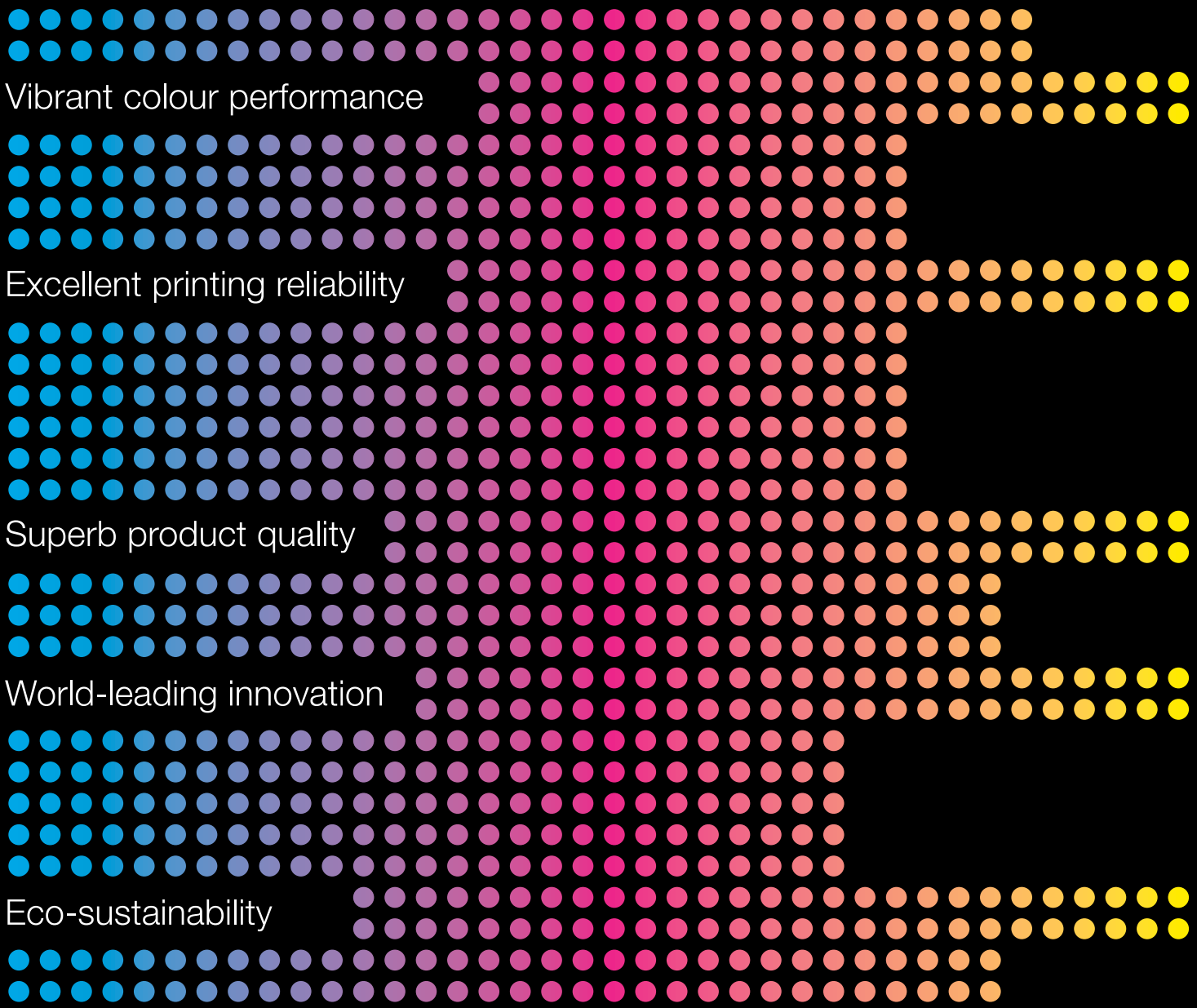
KIWOMASK W 857 screen-printable resist with highest mechanical resistance, for the selective brushing of metal surfaces

Andreas Künkele is Head of Applications Laboratory Screen- and Textile Printing

Further information:
KIWO – Kissel + Wolf GmbH, Wiesloch, Germany
tel: +49 6222 578 0
email: info@kiwo.de
web: www.kiwo.de

SENSIENT

the digital textile development powerhouse



Sensient Imaging Technologies SA
Z.I. Riond-Bosson 8
CH-1110 Morges 2
Switzerland
Tel: +41 21 811 2300

Sensient Imaging Technologies
2515 N. Jefferson
St. Louis, Missouri 63106-1939
USA
Tel: +1 314 889 7600
Toll free: +1 800 325 8110

High performance solutions for every fabric

Elvajet® sublimation inks

XENNIA® direct-to-textile inks

Visit us at: www.elvajet.com
For more info: info@elvajet.com

PRINTING AROUND CYLINDERS AND TAPERS

Ben Adner explains options for short-run production

Ben Adner, President of Inkcups Now Corp

Everyone has probably seen Grey Goose or Belvedere vodka bottles with a beautiful multi-colour image wrapping around them. Can something like this be efficiently done for shorter production runs? Many decorating companies are asking this question because many of their customers are asking for this capability. Printing multi-colour high-quality graphics is highly sought after for such drink ware products as glassware, barware, aluminium, plastic and stainless steel water bottles, plastic tumblers as well as other products like candle jars, cosmetic containers, industrial parts etc. Let's look at the existing technological options.

SCREEN-PRINTING

This is what is used for Grey Goose bottles and other long-run products. These dedicated screen-printing machines are high-speed, offer in-line pre-treatment and curing and cost hundreds of thousands of dollars. They are the most popular option for printing on cylinders today; it works well for long runs and where photographic-quality multi-colour images are not required. But for a batch of, say, a thousand pieces, screen-printing becomes totally impractical, especially if there are several colours – because of the need to make multiple screens (one per each colour), lengthy colour-matching of ink and painstaking machine set-up to register the colours on the product properly.

LABELLING

There are several labelling and sleeving technologies that are very popular for high-volume cylinder decoration. However, we are not going to discuss them in detail because they are primarily for long-run applications. For short-run applications, a more common labelling method is pre-printed heat transfer labels. These labels are normally outsourced and get applied by specialised machines, which roll the label on the cylinder under heat and pressure. The process works but there are many limitations – the labels are expensive and there is a long lead time to them, the application process is slow and has a high reject rate, there is a limited number of substrates it works well on, and it is very difficult to apply the label to any tapered container.

INK-JET PRINTING: ON-DEMAND SOLUTIONS

The limitations of screen-printing and outsourced heat transfer labels are pushing the need to have an on-demand solution for printing multi-colour on cylinders and tapers. This is where ink-jet printing steps in. With ink-jet, you can get any image you want, these being single-, multi-colour or photographic-quality images with exceptional colour representation at a much lower materials' cost and without outsourcing or a lengthy preparation and set-up.

The markets that are very hot for this set of features are drink ware for anything that goes in a cup or a bottle, glass and plastic cosmetic containers, candles and glass jars and various industrial-purpose cylinders.

Let's look at the three options for digital printing of cylinders.

1. In-line printing

The in-line ink-jet system spins the cylinder in front of the ink-jet head. This is a very fast method because the droplets are spraying directly down onto the cylinder. However, there are some serious limitations to this technology. A big problem is frequent defects in the print. With in-line printing there is no interlacing (overlapping) of dots to cover up for any missing nozzles, commonly done in scanning ink-jet printing. With no interlacing, each nozzle jets straight down on the product and if one of the 300 or 600 nozzles is missing (which is very common), you will see it on your product as a visible line of missing ink. This limits the capability of in-line printing to more industrial

Continued over

A bottle in the Helix inkjet printer

Bottles printed with the Helix

MURAKAMI

Manufacturer of Innovative Technologies
for Screen Printing Processes and Materials

"Expose the Quality"

MURAKAMI
www.murakami.co.jp
www.murakamiscreen.com

One Company

Serving the Global Screen Printing Market

EMULSION CAPILLARY FILM PRECISION STENCILS SCREEN MESH EQUIPMENT

Photovoltaic • Printed Circuits • Textiles/Garments • Large Format Graphics
Ceramics • Nameplates • POP Displays • Signage • Textiles/Roll to Roll
Bottle Decorating • Posters • Glassware • Automotive Industry
Touch Screen Panels • Membrane Switches • High Density Prints
CTS Emulsions • Screen Making Equipment and Devices

JAPAN - USA - CHINA - SINGAPORE - KOREA - TAIWAN - EUROPE

applications rather than decorative application where a visible missing nozzle would be totally unacceptable. Also, image size is limited to the width of the print-head. So, if you have a three-inch print head, the widest you can go with in-line printing is three inches. To overcome these problems, some companies stitch together several print-heads to effectively make a wider print, which is very expensive and makes the ink-jet systems very complicated to run and maintain.

2. Index cylinder printing

The next method for ink-jet printing utilises ink-jet heads that move in increments (index) down the centreline of the cylinder. When the print-heads move, they stop printing so as a result the print head may be spending some 30% of time on moving instead of printing, slowing down the print cycle. Also, the 'train' of the print heads and UV units can be quite long, so it takes time to get all print-heads past the image. Index printing has no real limitation on print size and is a lower-cost and effective way to print cylinders with good quality but it is not usually fast enough for those decorators who have significant production volumes.

3. Helical printing

I believe, when it comes to the combination of speed and quality, the best of both worlds is helical printing. The helical ink-jet moves the print-head along the length of the cylinder while continuously laying ink in a helical pattern (like the stripe on a barber's pole). It allows for dot interlacing – so print quality is excellent because potential gaps in the print are eliminated even if a few nozzles are missing. The helical system gives you a long image and, because moving and printing happens at the same time, you are not losing any revolutions of the cylinder and getting a much faster output. What makes this technology work is a very sophisticated software that 'reassembles' the dots when jetted in a helical pattern.

THE BREAKTHROUGH: EASY PRINTING ON TAPERS

If you look around, a high percentage of products in the drink ware market is not straight-walled but tapered cylinders. This is because tapers can be stacked and are easier to hold.

The task of undistorted printing of artwork onto a straight-walled cylinder is hard enough. But printing onto a tapered cylinder or a cone without image distortion is much more difficult. Inkcups Now and our machine, the Helix, has conquered this difficult task with the most sophisticated helical software in the world. The Helix can easily handle both cylinders and tapers, and the software automatically adjusts the dot location so no manual artwork distortion is required.

Another important factor for short-run printing is the ability to quickly set up for different parts and artwork without any downtime. So Inkcups has gone to great lengths to design the following three features into the Helix. Firstly, a universally-adjustable fixture (easily adjusts by knobs and handles) for cylinders and tapers. Secondly, the ability to remove the base chuck and nose cone of one product and put the base chuck and nose cone of a different product on in less than five minutes. And thirdly, just as importantly, the ability to recall previous job's settings, which include the gap from the print head, speed of rotation and the height of the bottle – so that the machine can automatically set itself up again.

The Helix industrial ink-jet printer for cylinders and tapers

WHAT TO LOOK FOR IN INKS AND CURING

What also ends up being very important for printing on drink ware and cylinders is inks. We've examined many inks for the ability to jet at high speeds, flexibility, durability, scratch resistance, including after exposure to water, and dishwashing resistance. Metals and glass will typically require some sort of pre-treatment but, when it comes to typical plastics like ABS, acrylics, polystyrene, it's important that the inks adhere well without pre-treatment.

Another useful feature to look for is clear coating. Clear coat enhances the product by adding gloss.

For example, if you print an ocean scene, you can use gloss to highlight the splashing waves. It is a beautiful cosmetic effect, but it can also help adhesion, especially to difficult surfaces, by covering the ink and protecting it.

The ability to control curing levels on the machine is a big plus. Typically a high curing level produces a matt finish; a low curing level produces a gloss finish.

Tapered pint glasses printed with the Helix

MARKET OUTLOOK

Digitally printing onto various sizes of cylinders and tapers with suitable production speeds is in high demand. The drink ware, cosmetics, industrial cylinder markets are looking for solutions for their short- to medium-run production volumes, and they need a machine that is fast enough, with excellent print quality and a price that won't make them cry – and, I believe, Inkcups Now Corp has created such a machine. The Helix, designed and built in the United States, is the only cylinder printer on the market that strikes this unique balance between excellent image quality, speed, price and flexibility. ■

Ben Adner is President of Inkcups Now

Further information:
Inkcups Now Corp, Danvers, Massachusetts, USA
tel: +1 978 646 8980
email: info@inkcups.com
web: www.inkcups.com

Capillary Film **Advanced.**

As the world leader in the engineering and production of capillary films for the specialty printing industry, Chromaline is also a world-class educator in the use and application of capillary films. Alpha MicroCap™ A is Chromaline's latest addition to a growing portfolio of Alpha high-resolution products for industrial / printed electronics applications.

For the latest advances in screen printing visit:

www.chromaline.com/ALPHA

A L P H A

MICROCAP™ A CAPILLARY FILM

- 20-micron line and space capabilities
- Highest resolution capillary film available
- Easiest application, delivers the most consistent results
- Superior SS & PE mesh penetration and adhesion
- Capillary film provides low Rz with thin EOM
- Custom cut sheet sizes available

Follow us!

chromaline® SCREEN PRINT PRODUCTS

www.chromaline.com

An **IKONICS** Company | ISO 9001 Certified | NASDAQ Listed: **IKNX**

160126

HOW SPECIALIST INKS CAN ADD THE 'WOW' FACTOR

Terry Kimrey describes special effects using the screen-printing process

What can you offer when a customer wants a screen or digital print project to stand out from the crowd? One of the easiest ways to make an impression is by screen-printing a special effects' ink, such as those manufactured by Nazdar. The creative use of special effects can set your shop apart from the competition. People will pay a little more for a 'wow' factor as long as they see the benefit of increased impact.

Print buyers have looked for creative ways to stand out for years, and Nazdar has upped the game recently by focusing on special effects to enhance digital and screen-printing. Special effects can change a one-dimensional advertising piece into a catchy sales tool.

There is a wide variety of special effects' inks available. Let's take a look at some and how they can keep your screen-printing equipment busy.

Heavy deposit ink adds a 3D 'wet look' to water drops

INK OPTIONS

Glitter pigments are one of the best attention getters. When mixed with clear and printed, glitter can highlight an image like nothing else. One of the coolest glitter effects I have seen was used on a print of a fireworks' display. Around the fireworks' burst, the printer had lightly highlighted with glitter. As you walked by the print, the glitter reflected the light in different ways making the burst shimmer and giving the appearance of movement.

Chrome silver is very versatile. This can be used to highlight chrome areas of a print such as a motorcycle tailpipe or as an undertone for transparent colours. Nazdar transparent colours over chrome ink add a nice shimmer effect to the colour. This is a good way to differentiate from the traditional red, green and blues.

Textured clears can give the appearance and feel of a rough surface. I like to use Nazdar Textured Clears in conjunction with Nazdar Gloss Clear. The texture inks have a matte or flat finish, so pairing textured clears with gloss clears provides a great contrast of subject matter and background.

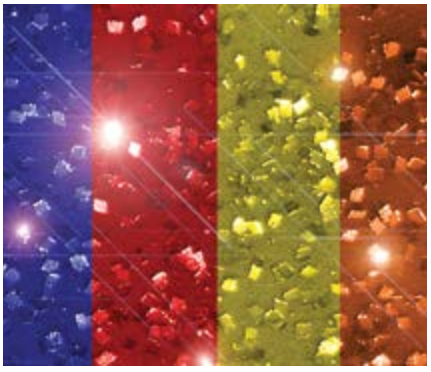
Heavy deposit clears were originally designed to print Braille characters. Graphic printers have started using them for multiple special effects. Nazdar Heavy Deposit highlights an area with the added feature of giving depth to the printed image. They can be printed with thick emulsion or capillary film build-up for the desired thickness or with several print layers to create an even thicker deposit. They can make water drops pop off the image and some people like to use them for a touchable contrast to an image.

AN 'ATTENTION-GRABBING' FEEL

Tack inks were developed to print on the back or bottom of a print that would be used on a countertop to prevent the item from sliding. Printers have found that, if you print Nazdar Tack Ink in dots on a graphic, you can create the rubber feel of a football or basketball. This gives the printed image a nice look and an 'attention-grabbing' feel.

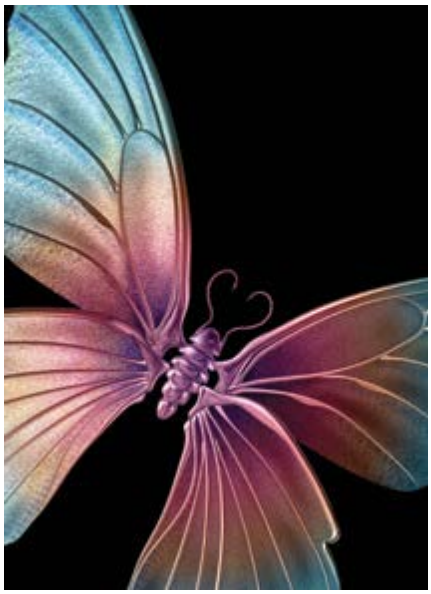
Colour change pigments in screen inks are a great tool for screen-printers. The inks are printed over a dark colour, preferably black.

Chalkboard inks make any surface write and erasable



Large glitter effects are very eye catching

Tack inks create a rubbery lifelike effect on this football



Transparent colours over chrome inks result in an interesting contrast

As you move past the print, the pigment will shift between two primary colours giving a printed image that 'second glance' factor.

Dry erase clears can be printed over any graphic, making it writeable with dry erase markers. You can put a logo on a dry erase board by digitally printing the logo first, then screen-printing the Nazdar Dry Erase Clear on top, and you will have a fully writeable surface with the logo protected by the clear.

Chalkboard inks can create a writeable surface on just about any substrate. Nazdar Chalkboard Inks are available in black, for that classic blackboard look, and clear to create a custom chalkboard surface. These inks are great for menu boards and kid-friendly activity mats.

UNUSUAL VERSATILITY

Magnetic receptive ink makes updating advertisement pieces easy. The inks themselves are not magnetic; they are receptive to a magnet. Imagine a display with an advertising piece that changes monthly – you can affix the display with flat magnetic roll sheets. Every month when a new advertising piece is printed, the back of the print would be coated with the Nazdar Magnetic Receptive ink. This way the printed piece attaches right to the magnets and there is no need for adhesives or other ways to hang a printed graphic.

Phosphorescent powders are also known as glow-in-the-dark pigments. These are fun pigments to use when a graphic will be displayed in dark places. The pigments do need light to recharge, and have glow time ranging from ten minutes to eight hours.

Gloss and matte clears are one of the most versatile ways of creating an effect. Nazdar Gloss Clears will create a wet look and be 30 to 40 points higher than standard substrates on a gloss meter reading. Overprinting just the subject matter will enhance the image without making the printed piece too reflective. Matte or flat clears give the image a dry texture. Matte clears tend to be about 20 points lower than common substrates and flat clears will be 30 to 40 points lower.

These are just some of the special effects' inks available and new ones are being developed constantly. The only limit is your imagination. Special effects are great tools for any printer and coming up with new ways to use them will set a printer apart from the pack. So the next time you are looking at your one-dimensional print and wondering if there isn't more you can do, the answer might lie in special effects. ■

Terry Kimrey is Market Segment Manager – Graphic Screen at Nazdar Ink Technologies

Further information:
Nazdar Ink Technologies,
Shawnee, Kansas, USA
tel: +1 913 422 1888
email: jtharp@nazdar.com
web: www.nazdar.com

WHICH INK CARTRIDGES REALLY GIVE VALUE FOR MONEY?

Jill Bach describes why cutting corners is a false economy

Cost-effectiveness – every print company strives for it. No matter what your sector is, from mail shops to label and packaging providers, every business wants to make sure that they are getting maximum value for money in every expenditure. This has led many print companies to consider reducing the cost of component parts by using refilled ink cartridges. However, is using cheaper, refilled ink cartridges really cost-effective for your business?

WORTH THE RISK?

Thermal ink-jet cartridges are a small but integral part of the production process. If they fail or don't perform reliably, the resulting costs can be significant. So dependable and consistent ink supplies are important if this is to be avoided says Mark Pentony, Operations and Engineering Manager at HP Speciality Printing Systems.

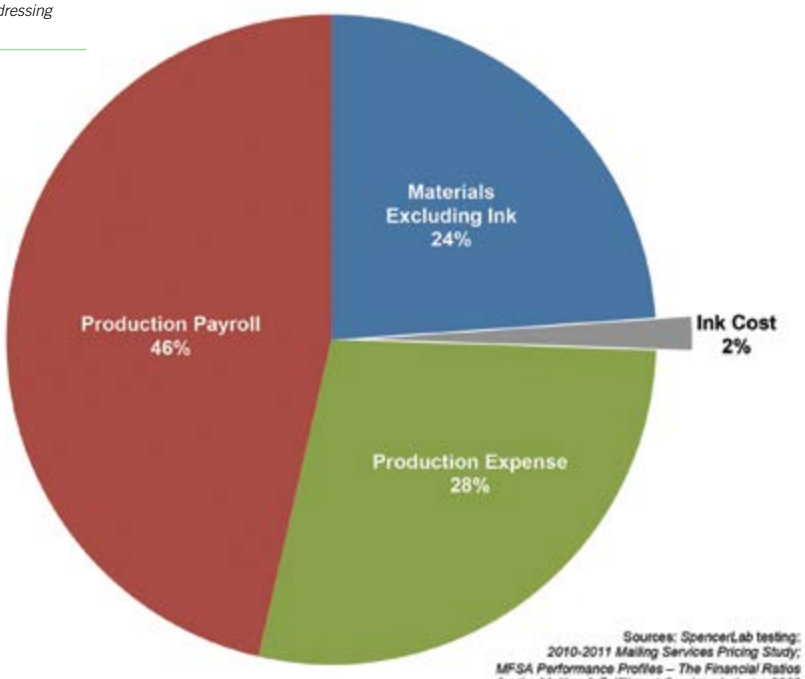
"For our industrial customers, the ink-jet cartridge is a very small part of the manufacturing system," he explains. "But it can stop that whole manufacturing system if the reliability is not correct. So quality has to be built into these ink-jet cartridges throughout the supply chain system. That reliability has to be beyond question."

While ink supplies are clearly a crucial component for any printing company, an MFSA report[1] found that for the average mail addressing company, ink supplies make up just 2% of the total production cost. Thus, when companies try to cut costs by using cheaper, refilled cartridges instead of proven suppliers such as HP, they are taking a large risk for a relatively small initial saving.

All production managers will look to reduce their running costs where possible. But trying to make savings on a component that accounts for just 2% of your costs must be seen as a false economy when it brings uncertainty into the production process.

Ink cartridges that do not have the same rigorous manufacturing standards as a supplier such as HP may bring with them a range of unforeseen problems that quickly wipe out any savings made.

Typical production costs for a mail addressing company



Sources: SpencerLab testing; 2010-2011 Mailing Services Pricing Study; MFSA Performance Profiles – The Financial Ratios for the Mailing & Fulfillment Services Industry 2008

HP ink-jet cartridges are rigorously tested

HP TIJ 2.5 cartridges deliver excellent outcomes

Cartridge reliability has to be beyond question

HIDDEN COSTS

Missed deadlines, inconsistent quality, unhappy customers, late delivery penalties, unexpected downtime and increased labour costs – in the schedule-driven printing environment there are various ways that cartridge problems can cause a chain reaction of costs and problems.

Cartridges that arrive 'dead on arrival', in other words that fail to print out of the box or have significant leakage, may be compensated for under warranty but nevertheless cause disruption and increase money spent on inventories. Even more disruptive are cartridges that fail midway through the production process, because operators might not realise the failure until significant waste material has been generated.

Furthermore, cartridges that give lower print quality will also have implications on cost. Even if customers are happy to accept a slightly lower print quality for certain jobs, a lack of print quality consistency could increase labour costs for verification of job accuracy. Blurring of text, bleeding into adjacent areas, poor barcode readability, loss of detail and ghosting are all problems that have been known to arise with refilled cartridges. These problems mean that work has to be redone and so productivity is negatively affected.

Many companies who have tried using refilled cartridges have encountered some of the problems outlined here and have since made the decision to go back to proven suppliers such as HP. Craig Derr, ink-jet supervisor at Action Mailers in Aston, Pennsylvania, is one example. "We've tried refills in the past," he states. "But now we won't use any ink-jet ink that isn't a brand new OEM ink from HP or Think Ink."

Every HP ink-jet cartridge meets strict quality standards to give business owners consistent printing performance and reliable results, a better strategy for cost-effectiveness than switching to cheap, refilled cartridges.

PERFORMING BETTER THAN THE REST

HP has been a long-term leader in printing solutions and so its technologies and processes have been tried and tested over thirty years. The HP TIJ 2.5 production line has manufactured more than 150 million TIJ 2.5 cartridges for 650,000 industrial customers. Newer companies simply cannot match this experience and the expertise that comes with it. Involved in the production process is an army of supply-chain, engineering and manufacturing expertise.

"For the manufacturing of each cartridge we've close to 100 individual steps, and only by testing each individual step can we make sure that the quality at the end of the line is as good as we currently see today," says Colin Judge, NPI Engineer at HP Specialist Printing Systems.

HP TIJ 2.5 cartridges are made from high quality materials chosen for their robustness and compatibility. The whole manufacturing process is automated which helps deliver consistency and provides a means for stringent testing.

Testing is critical and occurs throughout every stage of the manufacturing and production process. This ensures HP always delivers high levels of quality and reliability.

At HP, every single cartridge is tested multiple times before it goes to the customer. HP print tests the cartridge and then makes sure every single nozzle is firing as it should and in the correct position. The cartridge is then tested again on a printer and checked for quality by one of the engineers. So, not only does HP test its cartridges, it tests its testing systems as well. Here lies the key to HP's ability to manufacture 'no-fail' print cartridges that, in recent tests, have been proven to deliver reliable and consistent performance every single time. HP explains their manufacturing and testing process in detail in a short video that can be found on their YouTube channel by searching for the title: 'The HP InkJet Thermal Technology 2.5 Advantage.'

CONCLUSION

Given the risks and hidden costs that can quickly escalate due to print cartridge defects, it must be viewed as bad economics to bring risk and uncertainty into the equation when the area of saving is so minor. On reflection, it is perhaps not surprising that HP's levels of reliability and quality are very hard to reach for refilled cartridge manufacturers, given the scale and expertise of their testing processes. For the foreseeable future, it would seem that the best decision for print companies is to avoid unnecessary risk and unforeseen costs by sticking to proven and trusted ink suppliers such as HP, and thus ensure production efficiency, reliability and consistency from their ink cartridges.■

(1)Data taken from SpencerLab white paper, 'Reliability Tested' 2012. Read the whole report at http://www.spencerlab.com/reports/SpencerLab-HP-TIJ-2.5_WhitePaper_Feb2012.pdf

Jill Bach is Product Marketing Manager at HP, Specialty Print Systems Division

Further information:
HP Inc, Palo Alto, USA
tel: +1 650 857 1501
email: Jill.d.bach@hp.com
web: hp.com/go/thermalinkjet

THE POWER OF LASER TECHNOLOGY

Robert W Boyes puts marking and engraving into the spotlight

An often-overlooked capability of a laser machine tool is the powerful combination of both cutting and marking/engraving materials. This can often be a useful tool for delivering precisely marked parts in a single step, where in the past multiple steps were required. In particular, marking is a strength a laser brings to the party where other processes fall short.

Historically, there have been several means to mark or engrave parts. The most popular of these include:

- Photolithography
- Mechanical peening
- Additive processes such as applying a weld bead
- Powder marking using oxy-fuel
- Inkjet
- Plasma marking of metals
- Electrochemical marking
- Scribing
- Hot stamping
- Laser marking and engraving

There are advantages and trade-offs to each of the above methods. Process selection is primarily driven by:

- Substrate material – plasma can only process metals, for example, and some materials cannot endure etching chemicals
- Type of identification or engraving – this includes feature sizes, density and types of marks
- Regulatory requirements – some structural members require only additive processes
- Durability – some environments may be too harsh for ink, for example, and label life for some metal labels is specific to the end item
- Aesthetics – is this an artistic piece or part with specific requirements
- Part accuracy – How precisely marked must the item be?
- Process steps – would it help to have the process for cutting and marking in the same step?

EVALUATING PROCESS SELECTION

Some examples for how different technologies are employed may help illustrate how technology then process selection is evaluated. For example, when we build our machines, we could theoretically put engraved anodised labels on everything that requires a label on the machine. In fact, in our production process the machine's serial tag and electrical tags are built using our machines. Why would we use a metal tag in one place, and printed labels in others? The answers to these questions from our perspective offer insights that others also use in their selection process.

Coherent's Meta laser machine

Specifically, for the machine serial and electrical tag itself, we are seeking a level of permanence that other labelling technology cannot provide. A metal tag is not easily modified, and stays with the machine throughout its life. It also is exposed to a wide range of customer environments, from small manufacturers who may not have any environmental control, to facilities that are fully controlled. Also, the metal tags are on the exterior of the machine, which over the life of the machine is far more exposed than labels on the interior. Therefore, on the interior of the

Continued over

Electrical label on the exterior of the laser machine made of 3mm anodised aluminium

A CUBE FOR EVERY HEAD

J-CUBE
by
J-TECK3

J-TECK3.com | info@j-teck3.com

Interlock warning posted by each cover interlock internal to the machine

Connector port assembly cut with precise locations holes cut by a laser

House sign made of 25mm thick wood, ready for hand painting and seal coat

machine, we have more flexibility to select the printed labels we use.

As you can see, where there is one item used per system, and it is fully exposed, it makes the most sense to use a durable laser engraved label. On the interior, where the label itself can easily survive for the life of the machine, and is multi-use, it is more cost effective and sufficient to use a printed label.

VARIED APPLICATIONS

How can this be useful to manufacturers? These metal engraved labels are deployed on all manner of permanent installations. We have customers who use them in:

1. High reliability environments, such as labels on military hardware or precisely cut housings.
2. High environmental exposure installations, such as pump housings for oil and gas pumps.
3. High precision environments such as gauges (where alignment holes are critical tolerances)

These labels meet the standards set in the marketplace for such challenging installations.

However, the same technology is a cost effective solution in other applications, such as when a housing requires labelling and precise location of holes for components inside the housing. This can range from electrical panels to consumer goods, and materials range from metals to plastics such as polycarbonate.

A trophy made from 25mm acrylic

House sign made of 3mm acrylic, ready for mounting

The advantage of a CO_2 laser in this context, is that it can also do much more. The same machine that can produce high reliability metal tags can also process organic materials, such as wood, plastics/acrylic, gasket materials, and composite materials. This offers the ability to use the machine to produce the insulation gasket that goes behind the port assembly, acrylic pieces for environments where metal may not prove as durably, and even make artistic pieces, such as for the trophy or artistic maker communities.

In all, the requirements of the application and customer needs dictate the technology to use for labels and nameplates. A CO_2 laser tool is a very flexible tool that enables the manufacturer to expand their traditional products that they quote or produce into areas they previously might have had to outsource or even not pursue. Routinely manufacturers will purchase a laser for one application and find many other uses that were not part of the justification.

The other major benefit, as applies to the maker community, is the flexibility of the laser to process materials and achieve dimensional outcomes that are not realistic with other technologies. This flexibility unlocks their creative energies to expand the scope of the pieces produced.

Flexibility and reliability are hallmarks of laser tools, and CO_2 laser tools in particular. This is the true benefit of a flexible data driven tool, which enables a manufacturer to achieve a positive return on investment and high utilisation of their system. ■

A variety of foam, rubber, metallised rubber, and polyimide gasket materials can be cut on the same laser machine

Robert W Boyes is Senior Product Line Manager at Coherent

Further information:
Coherent Incorporated,
Bloomfield, Connecticut, USA
tel: +1 860 769 3306
email: Robert.boyes@coherent.com
web: www.coherent.com

TrueVIS VG Series printer /cutter

NEW

THE FUTURE OF PRINT & CUT HAS ARRIVED

New Cutter
Increased down force and accuracy.

4 New Printheads
Precision droplets in 3 sizes and a wide print pass deliver high-quality output and efficient ink usage.

New TrueVIS INK
Vibrant, fast-drying inks in 500cc pouches with reusable holders.

New Mobile Panel
Full remote control panel functionality from your existing smartphone or tablet.

New LED Lighting
Illuminated print carriage and maintenance area.

Advanced Contour Cutting Features
Include data sorting and perforated cut.

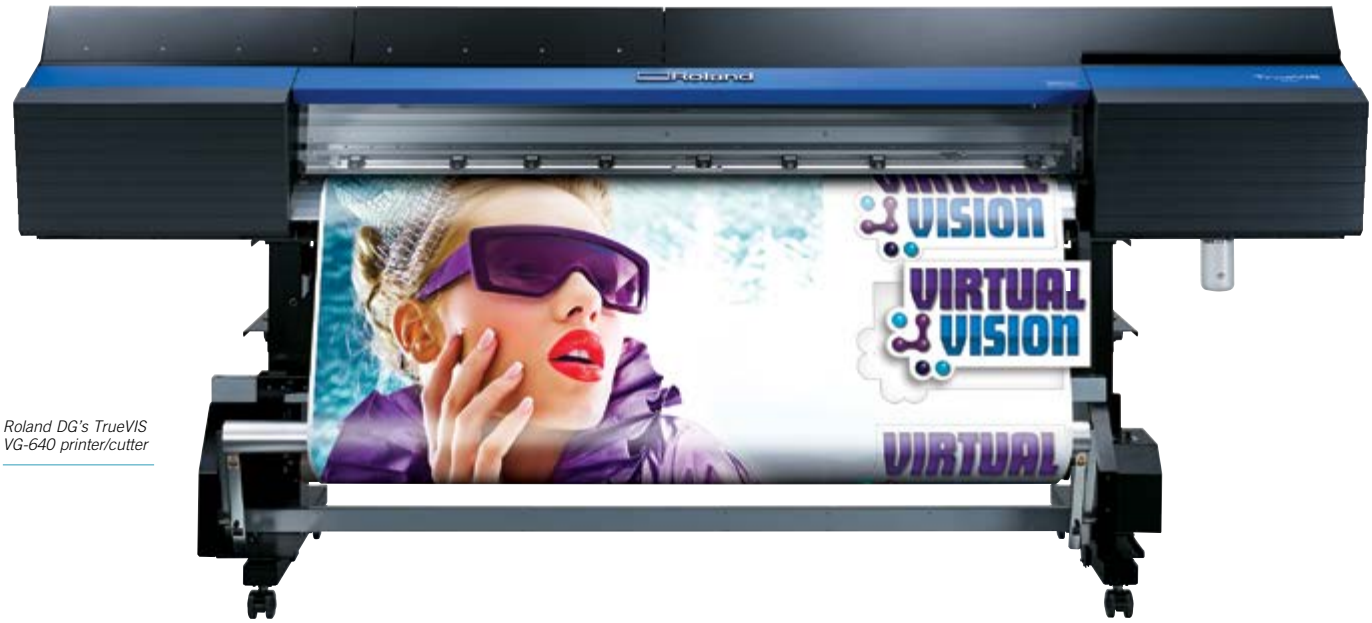
New Powerful VersaWorks Dual RIP Software
Supports PostScript and PDF natively for improved file reproduction.

3 Ink Configurations
Dual CMYK, 7 colour (CMYKLcLmLk), 8 colour (CMYKLcLmLkWh).

Discover the new TrueVIS VG Series, available in 64" and 54" models at **www.rolanddg.eu**

drupa
HALL 9 BOOTH E04.1-2

Imagine.
Roland



Roland DG's TrueVIS VG-640 printer/cutter

HEAD AND SHOULDERS ABOVE THE REST

Gillian Montanaro explores ten ways to stand out from the print crowd

Print service providers (PSPs) are under more pressure than ever before to deliver to tight turn-around times and even tighter margins. However, advances in wide-format print technology mean this is a time of great opportunity and potential for forward-thinking print businesses who want to push the boundaries of what they offer customers, and how they offer it.

So, in an increasingly competitive marketplace, what can print service providers do to help their businesses stand out from the competition and continue to grow profitably?

1. EXPLORE NEW MARKETS

A major advantage of digital wide-format print technology is its versatility; enabling printers to create a vast array of graphic applications which will appeal to many different markets. From hospitality and tourism venues to local authority premises, schools, hospitals, transportation hubs even manufacturing – the range of potential markets for digital wide-format print is virtually endless. PSPs needn't be limited by producing products only for the markets they know; they can consider other opportunities which complement their current customer base, product portfolio or skill set.

It may just sound like a marketing fad, but developing a 'persona' for each type of customer helps businesses communicate more effectively with their customers and potential customers, according to their needs and priorities. This approach is widely used today as part of a business's inbound marketing strategy. Put simply, it is about knowing what your customers are interested to see online, then creating it, so that when customers search the Internet to find it, they find you.

Further information on creating personas can be found here:

http://knowledge.hubspot.com/contacts-user-guide-v2/how-to-create-personas

http://makemypersona.com

2. EXPAND THE PRODUCT PORTFOLIO

Investing in an eco-solvent wide-format print device opens up a world of opportunity in terms of the media and substrates which can be used and the possible applications. A single Roland integrated print and cut device, for example, can be used to produce signs, floor and wall graphics, vehicle graphics, heat transfers for apparel, stickers, plaques, short-run packaging, point-of-purchase displays, badges, roller banners, gadget skins and much more.

With eco-solvent ink, the range of substrates on which it is possible to print is vast, including heat sensitive vinyls which can be incompatible with other print technologies.

The VersaUV LEF-300 LED UV ink-jet flat-bed printer

High impact eco-solvent print and cut applications

Unique effects created with Roland DG's VersaUV LED UV ink-jet flat-bed printers

A UV printer can print direct onto a host of objects and substrates to transform ordinary items into high-profit customised items.

By harnessing digital print technology, it is possible to produce quality, premium products which set the user apart from the competition. For example, embossed, gloss effects on phone cases or metallic print on car wraps and decals, or photographic images on banners.

3. NEVER STOP LEARNING

Digital wide-format print devices are designed to be as intuitive and user-friendly as possible, with 'plug and go' installation, but practical workshops and more 'formal' training courses are widely available and can prove a good investment. The Roland DG Academy, for example, offers short courses and on-line information focusing on a range of specialist skills such as vehicle wrapping, laminating and UV technology. Also more general 'business-focused' workshops provide guidance on breaking into new market streams or pushing the boundaries of a PSP's current field of expertise.

4. BE RESPONSIVE

Personalisation and short-run bespoke production represent a fast-growing trend in the industry. Digital print offers the flexibility and consistency of output to respond to customer demands for customised output – whether it's a single item or several thousand units. The principle behind digital print technology is one design many applications, one application many designs. Plus, set up time and costs are fixed and low, whatever the length of the production run.

5. MAXIMISE REVENUE FROM EXISTING CUSTOMERS

It's widely recognised that it costs five times as much to attract a new customer than to keep an existing one. If you are providing customers with signs and banners for their businesses, why not also offer heat transfer apparel for staff uniforms, customised promotional merchandise or wraps for their vehicle fleet?

Going back to the concept of the customer journey, there are usually five stages in which a customer moves once they have come in contact with the brand and its products, services or events — Awareness/ Attraction, Consideration/Conversion, Decision, Purchase and Advocacy.

Customers can move from one phase to another in a totally arbitrary way and it is important to maintain consistent contact with customers at each stage. The Advocacy stage (post-purchase) provides an opportunity for selling, up-selling and continued customer engagement.

This blog by website conversion rate optimisation company, Invesp, explains more about customer acquisition and retention trends: http://www.invespcro.com/blog/customer-acquisition-retention/

6. GET TO KNOW CUSTOMERS

The more that any company knows about their customers (what they do, how they promote themselves, who their customers are) the better positioned they are to advise them on their print requirements and to develop a relationship with them which goes beyond simply supplier and customer. Not only will this reap rewards in terms of cross-selling additional services, it will help deepen loyalty for future business.

Continued over

7. ENCOURAGE CUSTOMERS TO BE AMBASSADORS

The power of 'word of mouth' is no secret and it's not that surprising that existing customers are undoubtedly the most effective and powerful promotional tools. It's really worthwhile developing some case studies for use online or in marketing materials and to have a couple of key customers who are willing to speak to prospective customers and provide testimonials.

Crafting a case study takes some time. Here is a free guide that shows the key steps here: http://offers.hubspot.com/ultimate-case-study-creation-kit?_ga=1.76729557.1507377068.1458246240

8. RE-VISIT LEGACY PRODUCTS AND CUSTOMERS

Product and design trends are cyclical, coming in and out of fashion. Re-visiting an archive of output may uncover applications which are the next big thing – again.

Roland DG Academies offer a wide range of practical workshops and courses

9. EMBRACE ON-LINE

More and more, customers are going on-line to research suppliers and purchase products. To compete with on-line print providers, some printers are moving either their full product portfolio, or their more commoditised range, on-line. Even if selling via the Internet is not an option for some PSPs, social media platforms are incredibly effective ways of showcasing products and services to prospective customers and referrers, particularly visual platforms such as Instagram.

On-line sources can also be great for inspiration in terms of new designs, applications, technologies and potential industries and sectors to sell product in to. Plus, it's a good way to keep in touch with what competitors are doing and what's happening in the industry.

There are lots of guides and sites for those interested in getting started with social media. Here is one source:

https://moz.com/beginners-guide-to-social-media/best-practices

https://moz.com/beginners-guide-to-social-media

Many businesses would say: "I don't have time to write new content" for my web site or social media channel, and sometimes this is a challenge. But this useful list shows you how you can create it once, yet repurpose it several times over:

http://watertightmarketing.com/2015/01/12/one-piece-of-content-20-ways-to-use-it/

General 'business-focused' workshops provide guidance on breaking into new market streams

10. DEVELOP A NETWORK

An effective way to develop new business is by nurturing relationships with other key referrers and industry partners. For example, it's very beneficial for architects and interior designers (and the suppliers they work with, such as painters and decorators) to understand the full potential of digital printing and applications which are relevant to exterior and interior design.

Similarly, designers are often seen as experts and consulted by brands and other specifiers for advice on which print company or technology to use. With so many technologies, print providers and options available to them, it can be difficult for them to know who best to turn to for their individual requirements and what to look for in a great printing partner. There is a gap in the market for print providers who are able to engage with designers, understand their needs and provide effective solutions. Building strong relationships with designers can be of mutual benefit and provide printers who engage in this way with a distinct competitive advantage.

From a business-to-business perspective, LinkedIn can be an effective platform for developing a PSP's network of referrers and suppliers. Further information on using LinkedIn can be found here:

https://moz.com/beginners-guide-to-social-media/linkedin ■

Gillian Montanaro is Head of Marketing EMEA at Roland DG

Further information:
email: gmontanaro@rolanddg.com
web: www.rolanddg.eu

WHERE IS THE PRINTING OF PACKAGING HEADING THESE DAYS?

Cristiano Bettè and Francesco Ferrari outline today's higher demands

Traditional printing technologies are being given a new lease on life, so to speak, when they are used to produce high-quality packaging. With the packaging printing market growing at nearly twice the rate of traditional printing, printers should consider investing in technology that allows them to produce the required high quality. Blankets are a good place to start.

Smithers Pira, the market research institute that specialises in the packaging, paper and print industry supply chains, projected global printing output to reach $870 billion for the full year 2015 with annual growth of 2% moving forward. By comparison, it sees the packaging market growing at a considerably higher rate of 3.5% per year, to reach 997 billion USD by 2020. Printers interested in capitalising on these market opportunities are therefore well advised to concentrate more on printing of packaging.

According to one of the latest research studies from Market and Markets, the global metal packaging market is projected to reach $135.69 billion by 2020. The study results indicate that metal packaging is becoming increasingly popular because of changing consumer tastes, the rising sales of grocery products, including frozen and chilled foods, as well as consumer preference for processed and packaged foods. It is also growing for pharmaceuticals and cosmetics because it offers a major advantage in how it protects contents from external environments.

Trelleborg's product development work is based on innovation

MORE DEMANDING REQUIREMENTS

Today, it is important to realise that packaging needs to be a lot more than just functional. Especially at the high end, the goal is to produce something of beauty that incorporates different dimensions, such as embossing, extremely high definition graphic elements, superb colour and metallics that truly shine. Trelleborg printing solutions operation specialises in offset printing blankets that allow for these exact objectives to be achieved with its well-known brands Vulcan, Rollin and Printec.

Rotogravure, the printing process that was traditionally used to print magazines, catalogues and packaging, has undoubtedly seen the greatest decline. This technique, in which the printing image is engraved onto a cylinder, has been virtually replaced now that the quality of offset printing has reached a comparable level. The main reasons for this are the lower production cost of sheet-fed plates and printing of short runs.

While the quality of rotogravure print used to be higher than that of offset machines, offset now produces similarly high quality due

Services and deliveries complete the process at Trelleborg Printing Solutions:

Incorporating innovative rubber compound developments

Development uses a solvent-free manufacturing process

Innovation and Research on printing blanket development

to improved technology. For instance, production has moved from 60 lines to 80 or even 100 lines per centimetre and traditional print screens have been changed to stochastic screens. This half-tone process based on pseudo-random distribution of half-tone dots, which uses frequency modulation to change the density of dots according to the grey level desired, creates incredibly high resolution images.

Nevertheless, this also means that much higher demands are placed on the surface finish of the respective blankets. They must have very small tolerances to transfer as much ink as possible because the slightest amount of accumulation of ink will cause a film to develop that experiences a loss of dot definition. The chemistry of the blanket is therefore very important to ensuring the optimum polarity and roughness, as well as affinity to water and ink.

Now that offset sheet-fed printing machines produce 15,000 to 20,000 printed sheets per hour, the printing blanket is a more critical element than ever before in ensuring that the quality of print is as perfect as it can be. Research and development work on printing blankets therefore focuses on the black art of the ideal compound mix for the blanket's surface.

HIGHER QUALITY BLANKETS NEEDED

If we take a closer look at a printing blanket, it would seem that it is nothing more than a single polymer sheet. That, however, is far from true. Trelleborg's product development work currently focuses on making its compounding completely different. Its thin printing blankets actually contain a number of layers, one of which is even compressible. The company is convinced that this is the key to achieving the highest quality printing. The compressible layer in a printing blanket is extremely important because it provides rebound to give the right pressure to transfer ink from the blanket to the print surface.

The print surface itself is yet another factor that adds to the complexity of achieving the quality of printing that users are now demanding. Here, the key is to continue to raise the bar and to try to match the blanket just perfectly to the surface to be printed. For packaging, this could mean the soft surfaces, a glossy paper, corrugated card that needs to be protected from being crushed, the flimsiness of film or the hardness of metal.

Blankets used for packaging printing have usually no compressible layer. When printing at 100% saturation these blankets are adequate.

However, printers and their customers now demand the same quality of print on metal as on paper or cardboard. For the production of images, where screen and dot reproduction need to be extremely sharp and clean, a compressible layer is required to ensure clear and precise images. Trelleborg claims it is the only manufacturer of printing blankets that can offer a blanket with the proper compressible layer for metal decorating. ■

Cristiano Bettè is R&D Director and Francesco Ferrari is Technical Service Manager at Trelleborg Printing Solutions

Further information:
Trelleborg Printing Solutions, Lodi Vecchio, Italy
tel: +39 0371 406227
email: printingsm@trelleborg.com
web: www.trelleborg.com/printing

IS GLOBAL HARMONY IN YOUR FACILITY?

Chuck Nall explores the need for greater responsibility in protecting resources

First, do you know what the Global Harmonization System (GHS) is and how it affects your business practices? GHS is a classification and labelling system developed by the United Nations with the co-operation of various governments and international organisations. This system has been facilitated with the easing of trade barriers and the rapid growth of international trade. To a lesser extent the ease of international information flow with the Internet has also been a factor.

GHS has been implemented into EU law and the OSHA (Occupational Safety and Health Administration) in the United States. Not all countries have fully implemented GHS into local laws. The primary function was to reduce the many and varied standards from country to country in order to promote economic growth, while at the same time improving knowledge and communication of hazardous materials handling, usage and storage. Chemicals with carcinogens, mutagens and reproductive toxicants are of special attention. While it has improved communication and safety of chemicals, it has not been without frustrations for multinational chemical manufacturers and suppliers.

ADOPTING CHANGES

Suppliers are now faced with decisions about GHS that will directly affect individual printing companies. Some will simply choose not to comply in countries that have adopted GHS, thus limiting availability of these products. Most, however, will adopt these changes. With these changes costs are likely to rise. Other chemicals and mixtures, which GHS treats somewhat differently, will possibly work less effectively. All of this is for reasons of greater safety.

In competitive markets the price of a product is almost always looked at first. Sometimes it is only at its base price, and sometimes without understanding net effective yield. Simply, if Product A costs €20 and produces 100 units while Product B costs €30 and produces 200 units, costs are not just costs. While this is simplistic and often absurd it is a daily fact of life between many suppliers and end-users. Now the relationship to the cost of a chemical between and before GHS will start to show.

The reality is that we all breathe the same air and drink the same water, resistance to GHS by some companies is perplexing. Unless one has been living in a communication free zone one has heard of the water crisis in the city of Flint, Michigan in the United States. While no one seems to be taking responsibility for the decisions made for that city it is clear that corners (price) were cut.

Settling of solid materials

Constant aeration and agitation of sewage upon plant arrival

NO CRISIS AVOIDANCE

Chemicals needed to avoid the crisis were not used and essentially an entire city's pipe infrastructure was corroded. The result – the city was left with toxic and undrinkable water for the immediate future. How does this relate to an imaging company, chemical supplier and GHS? Many of the procedures in an imaging plant use water and by default sewer systems. If one were to take these products to a local sewer/water department and ask them, "are these products safe to go in the drain?" what would the response be? These products would be inks, photo-emulsions, various solvents and thinners and screen cleaners. After doing exactly this, I was not as shocked as the water treatment specialist I contacted. The water treatment specialist first asked me if it was organic. Then he asked if I knew how water treatment worked. After a pause I said "I'm not exactly sure". Understanding how basic water treatment works will certainly enlighten your knowledge of the chemicals your company uses and processes you employ.

Any water processing plant collects what its users send it. It is rapidly mixed with a coagulant to promote the collection of waste particles. This is then allowed to settle and be collected, filtered, and finally disinfected. When water treatment began its purpose was

Raw sewage enters the treat-plant into the oxidation ditch

to handle almost entirely organic human waste. The process today is very similar to 100 years ago. What is not similar is the waste we are sending. The average imaging plant is sending exponentially higher amounts of inorganic compounds than a household into the same water treatment facilities.

REFLECTING THE REALITIES

Global harmony is not just for manufacturers and suppliers. Everyone is breathing the same air and drinking the same water. Manufacturers and suppliers will be legislated into communication of chemical contents being said; it might be time for end users of all chemical products to survey them with these new GHS standards, and make individual global harmony decisions that reflect the realities for the cities like Flint, Michigan. This is the reality of shared citizenship. GHS is an industrial reality and some suppliers will move forward while others will disappear. End-users can sit back and use what is available without ever looking at their individual responsibility. Governments have taken a macroeconomic view in how best to protect water and air resources, but the days are nearing when municipal governments will look much closer to end-users for a greater responsibility in protecting resources. Global Harmony can exist in individual plants by understanding GHS and looking at chemicals and processes that make for less environmental impact. Is global harmony in your facility? ■

Chuck Nall works in Technical Sales at Easiway Systems

Further information:
Easiway Systems, Inc, Delano, Minnesota, USA
tel: +1 763 972 6306
email: mr.chucknall@gmail.com
web: www.easiway.com

THE CONTINUING IMPACT OF REGULATIONS

Elaine Campling explains the meaning of the latest set of requirements

The EU Commission draft regulation and new Annex VIII to CLP on the harmonised requirements for notification of hazardous mixtures to poisons centres has been published by the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG-GROW):

http://ec.europa.eu/growth/tools-databases/tbt/nview.cfm?p=EU_350_EN

Draft Commission Regulation amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures by adding an Annex on harmonised information relating to emergency health response

National authorities have been consulting stakeholders for comment on the draft documents for input at the REACH Committee meeting on 16/17 March, with a vote expected in April. The impact of the regulation will depend on whether you import or supply mixtures for consumer, professional or industrial use.

REQUIRED INFORMATION

Importers and downstream users placing hazardous mixtures on the market for consumer use must submit the required information (notify) from 1 July 2019 and for professional use from 1 July 2020. The required information includes information on identification of the mixture, hazard identification and mixture components.

Suppliers of hazardous mixtures for industrial use benefit from a longer transitional period (to 1 July 2023) and a limited submission option, consisting of the safety data sheet, as long as "rapid access to additional product information" is provided by means of a 24/7 emergency response telephone number for use by appointed bodies during emergencies.

Suppliers of hazardous mixtures for professional use are expected to argue for a longer transitional period from the consumer use group to allow for the consideration of lessons learnt. All benefit from a sunset period until 1 January 2025, if the hazardous mixture has previously been notified to an appointed body in accordance with Article 45(1) of the CLP Regulation, before applicability of the Annex. This is providing there has not been a significant change since the earlier notification, the details of which are set out in Section 4.1, Part B of the Annex e.g. significant change in composition, or new toxicological information on the mixture or constituent substances.

PERMISSIBLE CONCENTRATION RANGES

A single submission for a group of mixtures is possible, providing the grouped mixtures have the same classification for health and physical hazards and the concentration of ingredients are within permissible concentration ranges, set out in 3.4, Part B of the Annex - the width depends on the hazard rating of the substance.

The use of generic product identifiers for mixture components is also provided for (perfumes, fragrances and colouring agents), providing these components are not classified for health hazards of major concern (Annex B, 3.4.1). Health hazards of major concern include acute toxicity, Category 1, 2 or 3 and serious eye damage, Category 1.

However, suppliers of industrial mixtures where a 24/7 emergency response system is not in place, will find that the proposed regulation significantly limits group notification for products such as printing inks, which differ only in the level of pigmentation, since the cut off is 10% for the generic components of the mixture in total. In the case of a particular range of printing inks, the pigment concentrations often exceeds the 10% limit, meaning that each product within a range (shade) may require a separate submission, despite there being no difference in hazard profile. Representation is being made on this by Industry and Trade Associations.

'UNIQUE FORMULA IDENTIFIER'

A big issue during the whole preparation period and several years of consultation on the development of the regulation has been the identifier that poison centres will use to marry up a particular product with its composition, or safety data sheet in case of limited notification. Industry wanted to use their own product codes, or trade names, but in the end a requirement for an alphanumeric 'Unique Formula Identifier' (UFI) was decided upon.

The UFI must be electronically generated by the submitter and indelibly marked on the label or packaging of a hazardous mixture supplied for consumer or professional use. It must be clearly visible, legible and preceded by 'UFI' in capital letters. In the case of a limited submission, it is not necessary to include the UFI on the label or packaging, but it must be included in the safety data sheet.

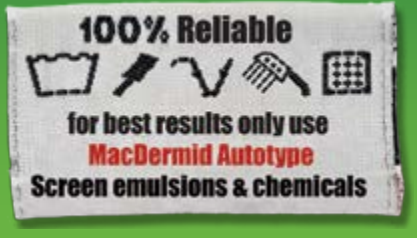
The UFI will be generated through a website that will be made available 24/7 by the European Chemicals Agency, who will also develop a European product categorisation system. However, there are implications on website maintenance and unforeseen system down time for companies trying to generate a UFI, which could cause chaos when trying to get products to market quickly e.g. a point of sale colour match.

A couple of further points are that notification must be in the official language, or languages of the Member State where mixture is placed on the market (unless otherwise allowed) and the regulation does not apply to mixtures for scientific research and development and to mixtures for product and process oriented research and development as defined in Article 3(22) of Regulation (EC) No 1907/2006.

STRENGTHENING AND CLARIFICATION

In conclusion, there are also a few points in the proposed legal text which could be strengthened, or clarified to avoid ambiguity e.g. the requirement for communication of the UFI is not specified in the case of mixtures for industrial use, when the submitter does not use the limited submission option. A UFI linking a submission to a group of mixtures is not covered, only the UFI linking to a "specific mixture". The definitions provided for the different use groups is also a bit meaningless e.g. "Mixtures for industrial use' means a mixture destined for use at industrial sites" (Annex VIII, Part A, 2.5). ■

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



UNZIP YOUR BUSINESS POTENTIAL

The **Autotype** Textile Range

You are only making money when you are printing shirts you can sell!

How much time is lost by screens that break down, or chemistry that is wasted because it doesn't clean properly? Simple questions which often have frightening answers! Yet, stencil making and screen cleaning doesn't have to be a drain on your profits.

The Autotype Textile Range has everything you need to make the perfect screen. This integrated range of screen emulsions and chemicals work perfectly to ensure that you get the result you expect, every time. With over 100 years of experience of manufacturing screen products, MacDermid Autotype has the reputation you can trust.

To find out more and see what we can do together, please contact:
screen@macdermidautotype.com
or to find your local MacDermid Autotype distributor go to:
macdermid.com/autotype

MacDermid
AUTOTYPE

W14-2016

DIGITAL EXPERTISE TO MATCH TRADITIONAL SCREEN-PRINTING STRENGTHS

When 85% of Kammann Maschinenfabrik was acquired by KBA in 2013, it could have been the case that the business would lose its identity within the larger KBA Group. According to Dr Christian Maas, however, almost three years later, this is certainly not the case, as the container screen-printing machinery specialist builds on previous successes, while also introducing the latest digital technology.

The KAMMANN name has been synonymous with the supply of high quality equipment for the decoration of hollow containers made from glass, plastic and metal since the mid-1950s. In 2010, the company re-emerged from financial restructuring following the purchase of tangible assets by a combination of the company management and a Munich-based private equity firm. Then, in July 2013, Koenig & Bauer (KBA) acquired 85% of the business, with the existing management team of Matthias Graf and Christian Maas retaining the remaining 15% stake.

Founded in 1817, the Koenig & Bauer Group is the world's second largest press manufacturer, offering a broad product range to the global media industry. Faced with difficult conditions in its traditional markets, however, KBA determined an acquisition strategy in 'promising print segments' to expand its position in the diversified packaging market. The first example to date of this strategy is the KAMMANN acquisition.

STABILITY AND INNOVATION

According to Christian Maas, although many customers only became aware of the KBA name following the creation of KBA-KAMMANN GmbH almost three years ago, they recognised the benefits of stabilising the KAMMANN business from strategic and risk management perspectives. "Our connection to KBA has only upgraded customers' perceptions of the brand," he maintains. In essence, the alliance has provided long-term stability and increased investment in development research, combined importantly with accelerated innovation and the provision of greater resources.

"We are aligning our R&D activities with those of other business divisions within the KBA group, mainly but not exclusively in the digital printing area," Dr Maas explains. "This is a cross division task, so it's going beyond what we do as KAMMANN. We are now fully integrated into KBA and our work is synchronised with other members of the group to develop common solutions."

In the digital printing arena especially, there are understood to be numerous opportunities for the cross-fertilisation of knowledge within the KBA Group. "The bare minimum we do is share information, before possibly growing into closer collaboration and joint developments" Christian Maas explains. "There are many possibilities for the future."

IMPROVED PRODUCTIVITY

Although KBA-KAMMANN is described as a small German entity, it is similar to the KBA group as a whole in being affected by economic business cycles in Europe especially. Overall, the portfolio has been stabilised and consolidated, a move that joint Managing Director, Christian Maas believes was necessary. "Since introducing the K15 CNC platform five years ago, we are now in a position to build on it and to expand into other fields as well. It's good to have the capacity to do other things but also to optimise the platform strategy for certain applications, eg integrated productivity systems, which have

Continued over

Claus-Bolza-Schünemann, President of the KBA Group

Matthias Graf, joint Managing Director, KBA-KAMMANN

Dr Christian Maas, joint Managing Director, KBA-KAMMANN

KBA-KAMMANN manufactures decorating machines for containers made of glass and plastic

become an important field and a source of customer demand… machines with higher speeds and more integrated into factory production lines, less manual feed and material flow, integrated into automated lines such as palletisers, depalletisers and other industrial systems."

KBA-KAMMANN has focused on opening interfaces, while installing and implementing inspection and quality control systems. And such innovations as automated ink supply and 'check and qualify production inline' are now available. "In addition, of course, the reliability and ability of the overall systems are important factors… the more components you put into the line, the more issues faced that can be disruptive to productivity."

Furthermore, the company has recorded increased investment in R&D since the KBA acquisition. "We took advantage of several inspiring ideas within the KBA world – exchanging information and learning from others is an important feature within the group," Dr Maas confirms. "We attend regular KBA management meetings and as well as monthly reporting, there are high level quarterly reviews."

Matthias Graf and Dr Christian Maas, joint Managing Directors of KBA-Kammann

RECOGNISED BRAND

It is planned to retain the autonomous KAMMANN name and continue to operate the business from its existing location in Bad Oeynhausen, Germany. Some 140 people are employed at the site, including 20 apprentices, as well as a further 20 people in other parts of the world. A subsidiary has been opened in Shanghai to serve the important Chinese market, for example, where customers can see one of the company's decorating machines in operation.

The hollow glass industry continues to represent the largest proportion of sales (60%), followed by plastic and metal packaging. Europe and in particular Germany remains KBA-KAMMANN'S most successful market, followed by the USA, with Japan showing signs of improvement. "We are a global company," says Dr Maas, "with the ability to react to local market requirements."

Where beneficial, existing KBA international sales network resources are being utilised, although it takes time to make such fundamental changes. "We can't immediately switch everything from a KAMMANN sales team to a KBA sales team because the market and customers are too different."

DIGITAL TECHNOLOGY

Since introducing digital technology at the K-Show and glasstec 2012, the company has made positive progress, selling several machines on the K1 and K15 platforms. "It's good to have this technology available, with everyone asking what's new and what can be done; the option of digital technology has evolved into a prominent item on our discussion agenda with customers," Christian Maas explains. "It opens up new prospects into different markets. Digital and plastics are a very good fit but the glass industry can be more conservative and the inkjet process is possibly more difficult to implement successfully but we are getting ahead there too. Some major players that have bought our digital technology will soon be demonstrating some very interesting results. There are already sales in plastics and glass but customers like to keep a low profile in these early initial steps with such new technology!"

All KBA-KAMMANN high productivity systems are still based on screen-printing technology. The company recently commissioned a production line at an Indian glass customer that is running 110 pieces per minute with UV. And in the USA, a machine has been installed that operates in double-up mode at 200 pieces per minute. "Both are screen-printing-based, which indicates that screen technology and conventional print technologies come into play when people want to go high speed with mass production in high quantities" says Dr Maas. "Digital is not the right thing to do in these areas… screen is preferred."

The addition of digital alongside screen technology in the same portfolio allows KBA-KAMMANN to offer more solutions to customers who recognise the possibilities of combined machines and equipment that can be used for screen and digital decoration, so they have a fallback solution, offering safe production. "Screen and digital can offer special values to each other and may help to create a unique product," Christian Maas concludes. ■

Dr Christian Maas is joint Managing Director at KBA-KAMMAN

Further information:
KBA-KAMMANN GmbH,
Bad Oeynhausen, Germany
tel: +49 5734 5140-0
email: mail@kba-kammann.com
web: www.kba-kammann.com

PERFECTION IS THE KEY TO SUCCESS

New drying technology boosts high-end screen-printing capabilities

When Alexander Pöhlmann took over a print shop from a point-of-sale company in 1989, screen-printing was carried out on everything which was possible. Now, 26 years later, Siebdruck Pöhlmann GmbH is the specialist for highgrade stickers and labels produced by sheet-fed screen-printing. This development is the result of consistent investment in perfecting the production process, high-quality end products and optimum working conditions.

Nonetheless, the road was not always easy and required a precise company analysis. The management made the strategic decision not to follow the hype of digital printing but to make use of its own professional skills and the advantages of screen-printing. Due to the close partnership with other printing shops and machine manufacturers it turned out that digital print technology is not able to fulfil the high demands of industrial customers on labels, stickers and vinyl lettering. According to Pöhlmann the optimisation of the operational structure is the base of efficient and successful production.

A view of Pöhlmann's modern production hall

PROGRESS THROUGH TECHNOLOGY

Following the famous brand motto 'progress through technology' the complete production process from material store to pre-press, printing and finishing has been optimised as a consequence. The aim has been to shorten the delivery times by keeping highest quality standard and to offer not only mid-size and high print runs but also small-size runs within the shortest time.

The well-stocked material store, equipped according to the customers' requirements, is the basis. Not only standard foils but also special foils of all well-known suppliers are available and, if there is only roll material disposable which meets the necessary specification, this is no problem, as it is cut into sheets by automated winders. During the early stage Pöhlmann focused on processing small- and mid-size material up to a maximum of 700 x 1,000mm. Printing jobs with a size of 350 x 500mm are produced at high quality and high speed with three all-automatic cylinder screen-printing machines. A very special case in Germany, another cylinder screen-printing line is used to print sizes of 500 x 700mm.

The new ESC-Wicket dryer's special design enables gentle drying of the printed sheets

According to general manager Pöhlmann production planning is an important key to achieve optimal employment of the printing lines. The use of modern CtS technology leads to quick screen production with clear, sharp details and absolute repeatability. The screen production as a standardised process enables correct allocation of the suitable printing machines with the corresponding dryer, proving to be an invaluable benefit for the machine, quality and order management.

CORRECT PROCESSING

Another important feature to ensure the quality of the finished product is the correct processing machine. Pöhlmann has the choice between two programmable Polar

ESC-AT screen-printing machines installed at Siebdruck Pöhlmann

cutters, various punching machines and five all-automatic digital cutting machines.

Apart from the close customer support one of the company's main priorities is the intense partnership with their machine and material suppliers. A long-term co-operation is the base for the constant exchange of market information and the recognition of new and interesting trends.

The company ESC in Bad Salzuflen, leading provider of machines and systems for industrial screen-printing applications for more than 67 years, is an example for such a successful partnership. This was already established in 2002 when Pöhlmann was investing in the first all-automatic cylinder screen-printing machine from ESC.

The company's new investment, the ESC-Wicket long-run dryer, has been constructed by ESC according to the requirements of Siebdruck Pöhlmann. This new drying technology now completes the existing systems as a continuous-flow dryer and UV-dryer and allows market demands to be answered even more flexibly.

The ESC-Wicket systems enable secured drying of solvent inks on different flexible materials at high production speeds. The process is very gentle and avoids material distortion, because drying is done at low temperature with high fresh air supply and long exposure time. Thus the ESC-Wicket ensures increased register accuracy and leads to increased energy consumption compared to conventional continuous-flow drying systems with circulating air.

SPECIAL CONFIGURATIONS

These special wicket configurations allow a drying temperature up to 100 degrees C. ESC has improved this technology over the years and, meanwhile, it is used by leading European screen-printers.

The high quality and form stability without material distortion has a positive impact on the processing of the finished print products. This means that full use can be made of the precision punching and digital cutting machines.

The customers benefit from these perfect results, from the unique screen-printing advantages with regard to durability, colour accuracy and light-fastness by offering a vast array of materials. Such a company philosophy, realised by its twelve employees, impresses the explanation for the success. If screen-printing is being automated consistently as well as the production process being constantly optimised, it has strong growth expectations even in a digitised world. ■

Further information:
ESC Europa-Siebdruckmaschinen-Centrum GmbH & Co KG, Bad Salzuflen, Germany
tel: +49 5222 8090
email: info@esc-online.de
web: www.esc-online.de

Siebdruck Pöhlmann GmbH,
Bad Friedrichshall, Germany
tel: +49 71 36 99 189 0
email: info@siebdruck-poehlmann.de
web: www.siebdruck-poehlmann.de

TRENDSETTING TECHNOLOGY USES DIGITAL VERSATILITY

New installation sees test phase successfully completed

After it was extensively tested during nine months of daily operation with a few improvements being made in the process, The Thieme 3000D digital printing system has been installed at Blase, the large Westphalian printing works, handling industrial printing tasks which were previously only feasible screen-printed.

Blase GmbH & Co KG, with headquarters in Lübbecke near Bielefeld, has around 250 employees and is one of the largest screen-printing plants in Germany, specialising in sophisticated industrial printing applications such as industrial signage, glass prints and membrane keyboards. The new digital printing system from Breisgau's machine manufacturer, Thieme GmbH & Co KG, was installed for these tasks at the start of this year. Blase Managing Director, Thomas Struckmeier, is confident that his company has invested in trendsetting technology with the THIEME 3000D. "We are breaking new ground in the industrial printing industry with the Thieme digital printing machine," he states. "We now have the opportunity to provide our customers with the quality products they expect, but with the advantages of digital printing. This particularly includes personalisation options, even for small print runs, the flexibility in terms of time and the opportunities of multi-colour printing of vivid motifs".

RECIPROCAL PRAISE

Armin Gerland, Head of Thieme's printing systems division, reciprocates the praise expressed by his customer: "As pioneers in the industrial printing sector, Struckmeier and his team have played a large part in the successful completion of this test phase. Their team provided numerous constructive ideas and suggestions for improvement which we have been able to implement quickly." The Blase printing plant, which already operates several Thieme screen-printing machines, has "taken a very promising path" with its choice of new digital printing technology. "In the future, increasingly more products will be digitally printed, especially in the industrial sector," continues Gerland.

However, screen-printing still remains indispensable in many applications as demonstrated by the membrane keyboards produced by Blase. The keyboards, consisting of several film layers, are produced in a combined digital/screen-printing process, which enables individual design options such as colour gradients and photo-realistic motifs. "Digital printing will therefore not replace screen-printing but rather enhance it, since every printing technology has its own specific advantages," explains Gerland.

PRODUCED FROM "REAL MECHANICAL ENGINEERING"

There is a simple reason for this high quality digital and screen-printing process. Both printing systems are based on the same proven Thieme machine platform. Thieme's own

Continued over

The test phase of the Thieme 3000D digital printing machine installed at Blase Siebdruck has been completed successfully

development means a quantum leap in terms of quality for industrial digital printing, for which only less successful adaptations from the consumer sector have been available up to now. Because this is the first system produced from "real mechanical engineering" it can meet the high demands in the industrial sector for printing precision and contour sharpness. For users of both printing technologies such as Blase, the uniform machine platform also has advantages for material handling (e.g. mobile printing table, positioning points, flexible vacuum zones) and additional equipment for print optimisation (e.g. integration of cleaning and ionization systems) which are identical for both systems and which ensures an effective printing process.

The Thieme 3000D digital printing machine is suited for a wide range of printing formats, from 780 x 1080 to 2060 x 3360square m, with the option of special customised formats also being available. The printing system makes it possible to print on various materials (paper, cardboard, foil, glass, metal, plastic) with thicknesses of up to 50mm. Hence the Thieme 3000D meets all of the requirements for industrial foil printing, one of the main applications at Blase.

The digital printing unit can be variably equipped with printing heads and offers a resolution of up to 1600 x 2160 dpi.

FLEXIBLE ADAPTATION TO CUSTOMER REQUIREMENTS

The digital system, which is equipped with Konica-Minolta printing heads, was designed for maximum flexibility. The number and arrangement of the printing heads can thus be varied, with the maximum achievable printing resolution being 1600 x 2160dpi. Inks from different manufacturers and even customised inks can be used, which provides the user with far greater scope for their own process development. "In the industrial environment, with its wide variety of applications, it is important that we can flexibly adapt our machine concept to changing requirements – the test phase at Blase has already shown this,"emphasises Gerland. "Thieme's strength is being able, as a machine manufacturer, to offer the flexibility sought by our customers with regard to the free choice of formats and inks or printing head specifications."

Struckmeier confirms this from the user's perspective: "We must manage the highly diverse requirements of our customers every day. In the past, we have met these requirements solely with screen-printing technology. The combination of technical digital printing with technical screen-printing opens up almost limitless new opportunities for us and our customers." ■

Further information:
Thieme GmbH & Co KG, Teningen, Germany
tel: +49 (76 41 5 83-0
email: info@thieme.eu
web: www.thieme.eu

Roland DG launches TrueVIS VG-640/540 printer/cutters

Roland DG has launched the TrueVIS VG-640 and 540 1.62m and 1.37m printer/cutters, a new generation of wide-format, eco-solvent inkjet models to be released under the TrueVIS brand name.

According to Yuko Maeda, division president of Roland DG business development unit, the TrueVIS brand expands Roland DG's technical capabilities in ink formulation, print-head design, precision control, and firmware engineering, resulting in far greater flexibility for Roland DG customers moving forward. "We will now be able to match the most appropriate head technology to each application and market that we serve, delivering the best available solutions to all of our users," says Maeda.

The VG series represents Roland DG's most advanced printer/cutters ever. Maeda states: "Our goal was to provide an innovative, state-of-the-art solution for our customers' businesses, while delivering optimum production capability for a vast array of signs and graphics. VG printer/cutters are the ideal tool for producing indoor and outdoor advertising, vehicle graphics, banners, posters and displays, labels and decals, packaging prototypes, apparel heat transfers and more."

TrueVIS VG series printer/cutters are equipped with four newly developed Roland DG FlexFire print-heads which more flexibly control the metallic plate attached to the ink chamber for a higher firing frequency. The FlexFire print-heads also deliver precision droplet placement in three sizes, and an approximately 25% wider print pass compared to previous Roland DG models.

The VG-640/540 also offers seven-colour (CMYK plus light cyan, light magenta and light black) or eight-colour (CMYKLcLmLk plus white) ink configurations. White ink provides excellent opacity for transparent window graphics while Light Cyan, Light Magenta and Light Black offer smooth gradations, perfect skin tones and beautiful images.

The VG-640/540 uses new TrueVIS INK which comes in 500cc pouches that fit neatly into reusable cartridges that slide into a hidden ink bay for clean operation with less waste. In dual CMYK configuration, up to one litre of ink can be loaded for each colour, ideal for high-volume, unattended production.

New Roland VersaWorks Dual RIP software – included with the VG – features a new core engine that accurately interprets native PDFs as well as legacy PostScript files, including files with transparencies. The precision cutting mechanism of the VG-640/540 is adopted from Roland DG's latest cutting advancements, facilitating reliable contour cutting of complex designs, and expanding the range of possible applications such as cutting thick materials for laminated floor signs. ■

New identity for Lüscher Technologies

Following the takeover of 100% of the Lüscher shares by Heliograph Holding last summer, the management of Lüscher Technologies AG has decided to redefine its corporate design by bringing it in line with the corporate identity of the Heliograph Group. Besides adapting the colours of the Holding Company for the company logo, the new company appearance also includes a redesign of all product brochures and a new web appearance.

At Drupa 2016, Lüscher Technologies AG will show a new model of its XPose! product line called the FlexLine 330L for 1.07 x 1.52m (42 x 60 inch) formats. The imagesetter combines a revolutionary dual optic with 5080/2540dpi with a unique patented inside drum system.

At the show, a further product development of the well-established MultiDX! 220 will be presented in the form of the MultiDX! 320, all-in-one computer-to-plate system. The new 320 line is equipped with a dynamic autofocus, which automatically adjusts any unevenness of the plate material of up to 0.5 mm during the exposure. Furthermore, the MultiDX! 320 can be equipped with up to 128 laser diodes to allow processing of larger screen frames. With this universal system, almost any printing forms, such as rotary screens, letterpress, flexo and offset printing plates, flat screens and aluminium and copper plates, can be exposed. Finally, Lüscher is introducing a "surprising novelty" for flexo applications. ■

Lüscher's new MultiDX! 320

Epson launches new wide-format SureColor screen-print models

Epson's two newest graphics solutions target screen-printers in the form of the 43cm SureColor P800 and the 61cm SureColor T3270 Screen Print Edition. Building on award-winning technology featured in the current Epson SureColor P800 desktop photo printer and SureColor T3270 large-format color printer, these new editions come bundled with AccuRIP Black Pearl SE software and Epson Screen Positive Film to produce high-quality film positives used to burn screens for the traditional screen-printing process.

Leveraging genuine Epson UltraChrome HD Ink and UltraChrome XD pigment inks respectively, the Epson SureColor P800SP and T3270SP provide a complete film positive printing solution. The new printers produce high-quality solid and halftone films up to 65 lines-per-inch (lpi) with high UV opacity and an exceptional black density up to 4.0 Dmax – all at best in class speeds, up to 24 films/hour with the SC-T3270SP1. Because these printers use a full colour ink set, screen-printers are able to produce high quality comps and even graphics with the same printer used to produce screen positive films.

Designed for professional use, the SureColor P800 is a borderless printer capable of high-volume printing with minimal downtime for maintenance. Equipped with Epson's latest PrecisionCore TFP print-head and specially formulated Epson UltraChrome XD pigment ink, the SureColor T3270 Screen Print Edition delivers brilliant colour and crisp lines on virtually any paper type. ■

Nazdar appoints Altair Servis MMC in Azerbaijan

Nazdar Ink Technologies has announced the appointment of Altair Servis MMC as a distributor of its digital ink solutions in Azerbaijan. Conveniently situated at the crossroads of Eastern Europe and Western Asia, Azerbaijan proclaimed its independence on 30 August 1991, prior to the official dissolution of the USSR. Located in the country's capital city Baku, Altair Servis MMC is the one of the leading printing equipment and solutions providers in Azerbaijan, representing brands such as Ricoh, Oki, GCC, Mutoh and Xante.

Altair has a strong sales team supported by an excellent service centre and continually searches for high quality and cost-effective solutions for its customers in the indoor/outdoor printing industry. Nazdar inks perfectly fit the bill as they offer exceptional compatibility, quality and cost effectiveness, combined with a seamless conversion process from OEM inks.

Mark Britton, Territory Manager at Nazdar responsible for the Azerbaijan region, comments: "Altair Servis MMC is an important part in the international puzzle of distribution for us. Securing highly qualified representatives with technical staff and a commitment to customer satisfaction is not easy in some of our more remote territories. As Nazdar continues to expand its geographic channels to market, new territories have become one of the most important methods of expanding our sales growth."

All Nazdar inks are plug and play when converting from OEM inks, with no need for the time-consuming task of re-profiling printers. The company states they come with one of the best warranties in the business covering the entire ink train should they be proven to have damaged an approved/compatible printer. ■

SII Printek introduces RC1536 ink circulation print-head

SII Printek's newest addition to its industrial ink-jet print-head product range, the RC1536, will be demonstrated live during Drupa. Featuring an extra wide print-width of 108mm, the printer cost is reduced by configuring print-bars with a small number of print-heads.

The ink circulation structure allows ink to circulate within the print-head at a high flow rate while the constant ink stream behind the nozzles removes bubbles and impurities and prevents sedimentation of ink containing large pigments.

Nozzles recover automatically and instantaneously, eliminating the need for routine nozzle cleaning and significantly reducing ink wastage.

The RC1536 has a high driving frequency up to 40kHz, and achieves a drop volume up to 100 picolitres, ensuring high productivity which meets industry requirements. Compatible with oil and UV-curable based inks, a water-based ink version is currently under development. It is suitable for a wide variety of applications such as ceramic tiles, cardboard and textiles. ■

SII Printek's RC1536 industrial print-head

Trelleborg partners with Nazdar to promote Marathon squeegees in the USA

Trelleborg's applied technologies operation has partnered with Nazdar SourceOne to promote its Unitex Marathon range of squeegees in the USA. As a leading supplier of screen and digital printing equipment, inks and supplies in the United States, Mexico & Central America, Nazdar SourceOne Distribution evaluated several types of squeegees to see how much they swell in UV-curable ink systems.

The Unitex Marathon squeegee performed extremely well during the evaluations, showing exceptional resistance to UV inks and monomers. The squeegee is now available in the US market and is ideal for textile and graphic screen printing applications.

Dave Durbin, VP, Director Screen Products for Nazdar SourceOne, comments: "SourceOne is excited to bring the Marathon squeegee to our customer base. Marathon performed very well under extensive testing for squeegee swell with UV inks and also is a great fit for the textile industry."

Unitex Marathon squeegees provide premium screen-printing performance and quality at a competitive price. Manufactured from Diphenylmethane Diisocyanate (MDI) technology, they are designed to give superior resistance to degradation by commonly used UV and solvent based inks used in modern printing processes throughout the world.

Paul Habberfield, Sales Manager within Trelleborg's applied technologies operation, states: "We have a long standing partnership with Nazdar and we are pleased that they will now be promoting our Unitex Marathon squeegee in the US. Extending our partnership with Nazdar is a testament to the durability and outstanding value of this squeegee.

Unitex Marathon squeegees are available in single durometer and triple durometer profiles in various Shore A hardness. Advantages of Trelleborg's Unitex Marathon squeegees include precision printing edge, excellent abrasion resistance and that they perform very well in UV inks and solvents used in modern ink systems. ■

New roll-to-roll LED UV-curable printer from Mimaki

Mimaki has launched a new 3.2m roll-to-roll ink-jet printer, designated the UJV55-320, which uses UV-curable ink and a low-energy LED light array. The company says this results in sign and display graphics that exit the printer dry and are immediately ready for further processing, significantly reducing production cycle times. In addition, UV-curable inks emit no volatile organic compounds (VOCs), minimising its environmental footprint.

"Large indoor signs backlit with energy-efficient LED lights are growing in popularity in locations such as airports, train stations and commercial facilities as brand owners move to more environmentally sustainable advertising," says Mike Horsten, General Manager of Marketing for Mimaki EMEA. "The new UJV55-320 is ideal for these applications, and we are very excited to bring it to market. Users will be especially pleased with the image opacity and broad colour gamut this outstanding printer delivers. And even better, we think it offers the best price/performance in its class, ensuring profitable operations."

The Mimaki UJV55-320 is an affordable roll-fed wide format printer that delivers speeds of up to 110 square m/h and resolutions of up to 1200dpi, depending on substrates. Instant-curing UV inks enable post-processing and operations immediately after printing, which helps shorten the operation time and improve productivity.

The UJV55-320 also features cyan, magenta, yellow, black, white, light cyan and light magenta inks that can be configured in a four-colour mode or six-colour set plus white. Light cyan and light magenta inks reduce grainy appearance in light colours and ensure smooth gradations. Built-in LED lights make it more efficient for operators to check printing quality of backlit signage during the production run, simulating their installed look and reducing waste and rework.

Automatic detection of nozzle faults and cleaning and/or nozzle substitution for high quality uninterrupted printing is complemented by twin roll capability. This enables printing on two separate rolls of the same media for simultaneous printing of two different jobs. ■

Ricoh TotalFlow cloud suite minimises IT burden for print operations

Ricoh is due to unveil its TotalFlow Cloud Suite at Drupa, a range of cloud-based solutions offered as SaaS (Software-as-a-Service), expanding the portfolio of workflow solutions to support commercial print service providers and corporate enterprise clients. The solutions that form the suite comprise data cleansing, web-to-print, marketing asset management, cross media services, and workflow automation.

These carefully selected Ricoh software and third party Ricoh-endorsed solutions have undergone a due diligence exercise, with a particular focus on data security and compliance with applicable data protection standards. Production printing businesses can select the software solutions they want to subscribe to without the upfront investment in an IT infrastructure to host them themselves. This also enables them to add new capabilities when demand dictates, allowing them to grow at their own pace, expanding their services in a responsive and measured way.

While the flexibility of TotalFlow Cloud Suite allows print service providers to build a software toolkit that addresses their own requirements and best fits their business needs, it also ensures updates and enhancements made to the individual solutions are taken care of without the client having to make any alterations to their own operations. There is no need to factor in cost or time for software and server maintenance or upgrades. Further TotalFlow Cloud Suite minimises the inadvertent downtime that can be caused by human error in the execution of these processes. ■

CCI introduces Warp Speed table top vacuum led-exposure unit

Specialising in providing innovative products and solutions to meet the screen-printing industry's needs, CCI's table top Warp Speed LED-EXP is designed for conventional or direct-to-screen exposures. It claims to increase production output drastically for screen making while saving space and energy costs. The LED-EXP also saves in bulb usage and costs compared with metal-halide bulbs which are costly and constantly need to be replaced.

Unlike metal-halide bulbs, LEDs do not require a light integrator and do not waste power and money while they sit idle like metal-halide bulbs. The LED-EXP will cut exposure time by more than 70% with the PLC controlled touch screen giving users complete control. Pre-sets can be used for every mesh count and coating used making the unit simple, easy, and affordable. ■

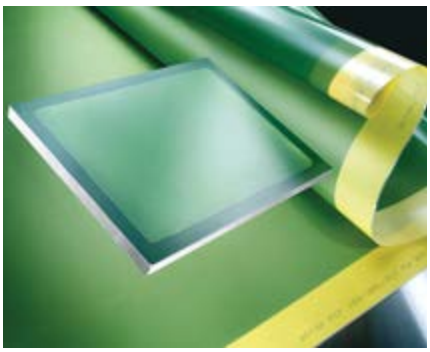
CCI's table top LED-EXP is designed for conventional or direct-to-screen exposures

Industrial screen-printing expertise from Sefar

Sefar is exhibiting its fabric ranges that highlight the Drupa themes of functional printing, packaging production, multi-channel, 3D printing and green printing. The company believes that it is responding to changes by opening up new visitor target groups with state-of-the-art technologies and new solutions that demonstrate its expertise in industrial screen-printing.

Sefar's PME is the high-performance mesh for screen-printers who want to expand their options. These fabric solutions provide stencil manufacturers and printers with maximum precision and tightest tolerances, and allow the efficient and safe production of highest-quality stencils for printing the most demanding and sophisticated products in large quantities.

Also on show is Sefar PCF, said to be the company's unique pre-coated screen printing fabric range for industrial screen-printing by providing the best possible print quality together with maximum efficiency. The processing of this innovative product is clean, space-saving and environmentally friendly. ■



Sefar PCF pre-coated fabric range for industrial screen-printing

EFI increases investment in China

In its latest development to support its strong commitment to customers in the Asia-Pacific (APAC) region, EFI has relocated its APAC headquarters from Singapore to a new, state-of-the-art facility in Shanghai. The recently constructed building in Shanghai's Minhang district is more than twice the size of the company's former APAC headquarters. It houses a new, high-tech customer experience centre to provide real-life demonstrations of the productivity and quality advantages EFI's advanced industrial ink-jet, Fiery digital production print technology plus integrated MIS/ERP workflow and web-to-print software products offer.

"EFI's brand new APAC headquarters strengthens our presence and provides a platform for further growth in a region where face-to-face interaction is extremely important," states Stephen Green, EFI's APAC vice president of sales. "It also offers a great working environment for our employees, something we work hard to do in all of our facilities around the globe."

The move to the new Shanghai facility is the latest EFI investment in the region to address and support customers' on-going successes using EFI products. The company, which also has APAC facilities in Japan, Australia, New Zealand and India, continues to hire additional service, sales and R&D/product development staff in the region.

In addition to serving the entire region, the new Shanghai facility directly supports growing business opportunities taking place in China, a nation that is on pace to become the world's largest market for printing technology by 2017, according to industry vendor association NPES and print research organisation PRIMIR.

China already is one of the top countries for EFI's Cretaprint ceramic tile printers, print servers and inks. EFI Reggiani textile and VUTEk wide- and superwide-format ink-jet printers also have a strong, growing presence there. Additionally, the company has recently introduced a range of value-priced, dedicated roll-to-roll LED printers featuring advanced material handling capabilities to the China market. ■

Kornit Digital introduces Storm Hexa and Storm 1000

Kornit Digital has launched two new direct-to-garment printing systems that join its platform of Storm systems. The new Kornit Storm Hexa and Kornit Storm 1000 have been equipped with state-of-the-art ink-jet technology to turn them into advanced industrial direct-to-garment printing systems for medium-size businesses. Their features include a recirculating ink system to reduce ink consumption and to optimise reliability further, as well as a doubled number of nozzles to increase productivity of up to 40% over previous Storm configurations.

The Storm 1000 is the standard configuration of the new product family and features twelve print-heads in a CMYK and white configuration. It produces up to 170 garments/hour in high productivity mode, including inline pre-treatment. It covers a print area of up to 50 x 70 cm.

The new Storm Hexa is equipped with 16 print-heads and two additional colours for full CMYK, red, green and white support. Kornit believes it is the system of choice for colour-conscious applications such as the production of promotional and brand related garments. It also can produce up to 170 garments/hour in high productivity mode.

Both systems are based on Kornit's unique NeoPigmentTM printing process. They are equipped with advanced productivity features such as a built-in pre-treatment system, a quick replace pallet mechanism, a four litre bulk ink system, an integrated humidity system and a backup power system for a quick and easy system start. All Kornit printing systems are compatible with a variety of fabrics (cotton, polyester, blends, denim, silk wool and more) and are geared towards industrial mass-customization applications. ■

The Storm Hexa is one of two new introductions from Kornit Digital

FESPA UK Association's presentation videos available on YouTube

A useful resource of information, advice and tips, delivered by expert presenters at two recent conferences, is to be made available, free of charge, by FESPA UK Association. The filmed presentations, delivered at the Screen Printing Now conference in 2014, and those at last year's Fabric Printing Now conference, will be added to the Association's YouTube channel each week, until the complete collection is online.

The presentations cover a wide range of screen- and fabric printing topics and were well received by delegates at the two conferences. Subjects range from electronics in the display industry to textile printing in a digital market, and a total of 24 presentations will eventually be shared with the print community via YouTube.

The Association's Peter Kiddell comments: "We are hoping the content of these presentations will be helpful both to companies and individuals already involved in the sector, and possibly to people thinking about making a business move into this area. The presentations represent a fantastic resource of valuable information, and we hope will help to underline one of the many business benefits of being a member of FESPA UK."

The first presentation video, 'Polyester is not the only fabric' by Mitesh Patel of Premier Textiles, is now online. Delivered at last year's Fabric Printing Now conference, Patel looks at all things fabric, from quality to colour yield, and new developments in pigment ink print performance. ■

HALT confirms longevity of GEW LED UV systems

GEW (EC) Limited, the UV system manufacturer based in England, has made use of HALT (highly accelerated life test) procedures to improve the performance and the longevity of its LED UV systems. With its proven mercury arc lamp UV technology, the company has demonstrated that conventional systems can operate efficiently and reliably in a wide range of inhospitable environments. The purpose of the HALT procedures was to show conclusively that, in a hybrid set up implementing both Hg and LED technologies, even under extreme conditions LED systems also offer the same consistent performance and dependable reliability.

The impact of environmental conditions varies with the geographical locations and the climate in which UV systems are installed. In the specialised environmental test chamber at the GEW headquarters in England, LED UV systems are exposed to extreme temperature and humidity profiles and continuously monitored to confirm the performance and reliability of the LED lampheads.

During the test cycle the LED lampheads are operated at ambient temperatures of up to 50 degrees C (122 degrees F) and at up to 95% humidity. HALT proactively tests the life cycle and thereby increase product durability and reliability when operating under the harshest conditions.

Reliability tests and HALT testing of LED arrays carried out at GEW have convincingly indicated a potential service length of more than 20,000 hours even in adverse conditions. This is some seven to ten times longer than that of a conventional mercury-arc lamp with 2,000 to 3,000 hours.

Rob Rae, Technology Development Manager at GEW, explains: "At GEW we believe that the simplest solutions are the best. LEDs are the most straightforward and most effective solution for an increasing number of curing applications and therefore it is essential that they offer the same level of performance and durability as their conventional mercury arc counterparts." ■

GEW's LED UV systems have been put through rigorous testing

Armor Group enters industrial printing market

As a French-based global player in the ink and cartridges industry, Armor has founded a new business unit dedicated to digital industrial printing. Beyond industrial coding and printing, where Armor claims it is ahead of the global market, the company has been developing and producing inks for desk-top printing for the past two decades.

Last year the decision was taken to expand the business activities of the group by starting activities in inks for industrial printing. Following this road, at the beginning of 2016 Armor Industrial Inks (A2i) was created as a separate business unit dedicated to the development and production of high quality inks for industrial applications. These include sublimation, surface decoration and décor print.

A2i is based in Dortmund, Germany and benefits from the experience and know-how of two decades in the development and in-house production of inks. The experienced team of Armor engineers, chemists, sales force and marketing will be directed by Frank de Jonge joined A2i at the beginning of April. ■

New Streamline Ultima HPQ LO announced by Sun Chemical

Sun Chemical has expanded its Streamline range of eco-solvent alternative ink-jet inks with the introduction of a new ultra-low odour offering. The Streamline Ultima HPQ LO benefits from Sun Chemical's advanced low odour chemistry to provide a high performance ink that has been developed for use in Mimaki JV300 and JV150 high-speed wide-format printers.

Formulated with the same physical properties as the original inks, this OEM-compatible inkjet ink has been fully colour-matched and is inter-mixable with Mimaki's SS21 inks range. This enables printers simply to switch between inks to reduce waste and achieve total consistency of colour and high quality output, even when using a combination of inks during the same print run.

Users also benefit from Sun Chemical's HPQ LO (High Print Quality/Low Odour) ink chemistry platform, resulting in significantly lower odour emissions for improved production environments, especially in confined areas.

"All our Streamline OEM-compatible inks are highly engineered to replicate the colour and physical properties of original inks and are rigorously tested to ensure optimum performance," comments James Gould, Product Manager, Digital Aftermarket at Sun Chemical. "As a result they present cost-effective, operationally efficient alternative inks that guarantee the highest quality output. The introduction of our new Ultima HPQ LO ink to the Streamline portfolio further extends the flexibility of our eco-solvent alternative inks range to address the increasing health and safety responsibilities for print operatives.

Sun Chemical's new Streamline Ultima HOQ LO inks in action

The new Streamline Ultima HPQ LO ink is currently available in CMYK, with special colour options including orange and light black to be added to the series later in the year. ■

3M MCS warranty added to Mutoh ValueJet 1638X and 2638X dual-head printers

Wide-format digital printer manufacturer Mutoh has announced that its high performance ValueJet 1638X (162 cm) and ValueJet 2638X (260 cm) printer models and Mutoh + 3M Universal Mild Solvent Inks have been added to the 3M MCS (Matched Component System) Warranty programme for finished graphics. Application possibilities include fleet and vehicle graphics plus indoor and outdoor signs.

The Mutoh ValueJet 1638X/2638X printer models offer high quality 720x720 dpi production print speeds up to 29 square m/h (1638X) and 33 square m/h (2638X). With Mutoh + 3M Universal Mild Solvent inks in combination with qualified 3M products, 3M-certified graphics manufacturers will be able to provide warranties up to five years for various fleet and sign applications and up to eight years for indoor applications, with the full support of 3M as total solution provider.

Applicable to new ValueJet 1638X and 2638X printers, the 3M MCS Warranty programme will be rolled out in the EMEA business area towards graphics manufacturers having a Certificate of 3M MCS Warranty or wanting to apply for the certificate. The 1638X/2638X ValueJet printers and Mutoh + 3M UMS inks will be available through Mutoh trained and certified resellers. 3M media and overlaminates will be offered through 3M and 3M authorised resellers.

Labelled as a 3M MCS Warranty component, the Mutoh + 3M Mutoh Universal Mild Solvent (UMS) CMYK inks are available in special litre pouches for uninterrupted ink supply, providing the functionality of an ink cassette, but with the advantages of a bulk ink system.

The ink pouches are loaded in ink pouch adaptors that are mounted in the printers' ink slots. Mutoh + 3M UMS inks combine the key benefits of resin-based, eco solvent and mild solvent ink chemistries. Mutoh says they offer an unrivalled colour gamut and a unique gloss preservation. The CMYK ink set covers 83% of the Pantone C colour chart, are fixed and dried at temperatures below 50 degrees C and are suited for both high quality and high speed printing. ■

Mutoh's ValueJet 1638X and the wider 2638X have been added to the 3M MCS Warranty programme

SHOWING THE POTENTIAL OF FUNCTIONAL PRINTING IN DÜSSELDORF

Innovation for decorative and industrial applications to feature strongly

ESMA, European Specialist Printing Manufacturers Association, will be present in two pavilions at Drupa 2016. The first, in hall 3A 70, will be dedicated to functional and industrial printing with member companies such as SPS demonstrating screen-printing equipment used for food decoration (e.g. chocolate) and other special effects achievable at high operation speed. SPS's partner ATMA will showcase latest developments in machines for conductive and technical printing. German specialist in stencils, KIWO, will present printing of pressure sensitive adhesives with high electrical conductivity. A variety of decoration techniques for glass and other rigid materials will be in the spotlight in the ESC booth and another ESMA member, Marabu, will present applications of their inks for touch panels, tablet and smart phone masks.

Visitors to the ESMA Lounge will learn about the latest projects around smart tags, smart sensors, flexible and washable conductive inks used in textile industry, and the overall employment of various print technologies for the Internet of Things.

Further innovations will be highlighted in the second ESMA pavilion in hall 6 where Color Passport will present its revolutionary approach to colour management and reproduction on different substrates. Other experts in colour management, ColorGate, come to the show with development stations and state-of-the-art RIP technology for industrial printing with ink-jet. Last but not least, Intrinsic Materials, a specialist in nano-materials, will show its achievements in conductive inks and printed electronics components applied by the medical industry, such as disposable testers with smart tags.

FUNCTIONAL CORE

Functional printing will build the core of ESMA presence at Drupa and it is worthwhile briefly investigating what hides behind this term. In its early days, functional printing relied on chromatic inks which changed colour due to external influences such as light (UV/black light), temperature (heat), pH changes or water contact. They found their applications in printed gadgets, especially packaging which took marketing advantage from the distinctive special effects. This glowing and phosphorescent decoration started years ago and continues to reappear on the market on a continuous basis. More advanced and more functional opportunities have followed and entered new industries. Evolution in conductive inks and electroluminescence (EL) has not only benefited branding purposes (e.g. the light-emitting packaging of Bombay Sapphire Gin) but delivered solutions also for solar panels (fingers and busbars).

Initial applications have pushed the boundaries of functional printing. Printed circuit boards (PCB) and flexible antennas combining FM, TV, mobile, GPS in one antenna and used, for example, in automotive environments, gave rise to car radar systems for adaptive cruise control. Nowadays, near field communication (NFC) and RFID antennas are standard features in electronic devices and the integration of printing in the manufacturing process constantly improves their cost-efficiency. As far as electroluminescence is considered, a technological jump took place towards OLED (organic light emitting diodes). Flexible OLEDs integrated in fabric pave the way for smart textiles and wearables, as shown in one of the recent ESMA-powered international projects – POLEOT (Printing of Light Emitting Devices on Textile).

FASCINATING FUTURE

The door to the future of printed electronics, conductive inks and coatings is now wide open. Batteries (flexible, thin, rechargeable), energy harvest systems (based on the Peltier effect), smart tags and sensors are becoming common consumable goods, many of them disposable, too. Smart wearables and smart sensors increasingly find applications in medical and pharmaceutical sectors – for instance quick test strips for diabetics, blood analysers, smart blister packs, and more. Healthcare is one of the markets which embraces new solutions and enables successful business cases of printers who decided to 'go functional'. Quad Industries has developed temperature logger labels for blood bags used in transport. The smart tag registers and transmits data to a smartphone app to ensure the correct transport conditions.

When mentioning the smartphone, many may not realise the number of its components facilitated by printing techniques. Capacitive switches, batteries, touch panels and screens – printing once again replaces expensive and highly energy-consuming processes. Obviously, marketing departments will come on board, as well. One of the recent Audi TT brochures included printed controls which, after aligning with the smartphone on the right spot, turned the page into a controllable experience of the new model's cockpit display. Functional printing partners with anti-counterfeiting technologies and delivers combinations of inks, coatings and substrates to create invisible markers. Both for monetary needs or luxury goods, security print is the most efficient and cost-attractive protection against imitation. Current possibilities even offer fingerprint recognition surfaces.
Many of the above mentioned applications are included in the in-mould decoration process, be it for automotive or electronic devices – ranging from the integration of antennas in car mirror caps, in the car console, to capacitive buttons on 3D thermoformed parts and surfaces. The industry is growing and gives new, creative development dimensions for printers, manufacturers and product designers. ■

ESMA PAVILION IN HALL 3:
EPTA I ESC I Fimor I Global Inkjet Systems I Hurtz I K-Flow I KIWO I Lotus Holland I Martinenghi I PVF I Saati I Sefar I SPS I Technigraf.

ESMA PAVILION IN HALL 6:
Caddon I ColorGate I Color Passport I Intrinsiq Materials I Print-Concept I Teckwin.

ESMA
Driving Print Excellence

Further information:
web: www.esma.com/www.drupa.com

CELEBRATING TEN YEARS OF DEDICATED WIDE-FORMAT EXHIBITIONS

Amsterdam hosts largest digital event to date

March saw the return of FESPA Digital to its birthplace in Amsterdam, where 16,309 unique visitors attended the combined exhibitions, descending on the RAI to participate in the first global wide-format event of the year. An increase of 34% in footfall since the last digital show held during a similar time period in 2012, and a total of 23,240 visits during the four days, highlights the strategic importance and continual growth of the event.

The visitor data collected shows that some 75% of attendees are heavily involved in the decision making process for their businesses, and this was apparent by the record number of sales that were being made on exhibitor stands over the four days. Likewise, the high level of product launches witnessed on the show floor was also indicative of the importance that exhibitors place in FESPA Digital as the leading digital wide format event, and the wide-format launch platform of choice for new products in 2016.

SHOW HIGHLIGHTS

Particular highlights include Mimaki, who launched a series of UV-LED printers and sold 52 units throughout the show, with both resellers and PSPs making purchases. HP announced its Scitex 9000 industrial press, while EFI unveiled six new VUTEk printers, including textile and LED UV-curable inkjet options. Durst also launched its water technology dye-sublimation printer, suitable for soft signage and fabric applications, while Kornit Digital introduced two new industrial direct-to-garment printers within its Storm range.

Crowded aisles demonstrated the popularity of the exhibition

With its central location within Europe, Amsterdam proved an ideal setting for wide-format specialists to convene and expand their knowledge within the ever-changing digital print landscape, with visitors from 120 countries in attendance. The top visiting countries were the Netherlands (35%), Germany, UK, Belgium and Italy. However, visitors from North America, Asia, Australasia and Africa were also in attendance, demonstrating the truly international scope of the FESPA Digital exhibitions.

With four events under one roof, visitors were able to switch seamlessly between FESPA Digital, Textile, European Sign Expo and Printeriors to uncover all of the possibilities of wide-format digital print and non-printed signage. Popular features included the Wrap Hub and the Signage Demo area. Both the Digital Textile and Printeriors conferences received positive feedback, with global visitors from across the print, digital textile and interior design sectors in attendance. The Printeriors 'Print Hotel' showcase displayed the possibilities of interior décor and digital print, and its eye-catching room sets captivated visitors and exhibitors alike.

AN EXCELLENT CELEBRATION

FESPA CEO Neil Felton comments: "What a fantastic way to celebrate the 10th anniversary of FESPA Digital. I am delighted with how many exhibitors chose our event to launch their latest products and technologies, and those who visited left as true print superheroes; inspired, invigorated and excited to see where the next chapter of digital print and signage may be heading, taking away invaluable insights that will provide them with the opportunity to diversify.

"The halls were buzzing with activity and feedback from both visitors and exhibitors has been overwhelmingly positive, particularly for the value-add seminars, demonstrations, competitions and interactive workshops," Felton continues. "Many exhibitors have declared this their best FESPA ever, with expectations greatly exceeded. I can't wait to see what the next chapter will be in Hamburg next year."

Specialist Printing Worldwide at FESPA Digital

FESPA announced that its Global Expo, FESPA 2017, will take place during five days from 8 to 12 May 2017 at the Hamburg Messe, Germany. The event will cover ten halls at the exhibition centre and, as well as being a screen and digital exhibition, it will encompass FESPA Textile, European Sign Expo and Printeriors.

Roz McGuinness, Divisional Director, FESPA, states: "We always listen to feedback from our exhibitors and in the most recent survey Hamburg came out near the top of potential destinations. After careful deliberation, we decided that it was time to revisit this booming business location. The eighth largest city in Europe, Hamburg is a major transport hub and is easily accessible by plane from all major European and International cities as well as having excellent rail and road links, and an outstanding infrastructure to support an influx of visitors." Hamburg Messe enjoys a favourably central position, which is just ten minutes walk from the city centre as well as being close to the airport, which is served by more than 60 airlines. FESPA's Global Expo typically attracts 22,000 visitors from 125 countries, making it a truly international event. ■

Further information:
web: www.fespa.com

NEW STRATEGIC FOCUS ON PRINT FOR DÜSSELDORF

Focus on 'touch the future' covers future technologies

This year's Drupa international trade fair for print and cross-media solutions kicks off with a new strategic focus, improved scheduling over eleven days, a new look and greater frequency running every three years. Using the motto 'touch the future' the exhibition places the industry's innovative power centre stage and provides a platform for future technologies. The focus is especially on next-generation and highlight themes such as print, packaging production, multichannel, 3D printing, functional printing or green printing.

"With this strategic reorientation and its focus on future and highlight themes we are obviously on the right track. Because the response of international upstream suppliers to the industry has been very good – which was not a given in view of the difficult market environment," explains Werner M Dornscheidt, President & CEO at Messe Düsseldorf GmbH.

Accommodating some 1,650 exhibitors from more than 50 countries will give impressive proof of the versatility and innovative power of their sector from 31 May to 10 June 2016 in all 19 Düsseldorf exhibition halls. "International global players and market leaders will present themselves alongside aspiring newcomers and innovative outfits from throughout the world," underlines Dornscheidt. "The complete spectrum of print and cross-media exhibits and topics will be represented. Such a comprehensive 360 degree view of the entire industry is provided by nobody but Drupa,"

The mega trend at Drupa 2016 will be Print 4.0 as Claus Bolza-Schünemann, Chairman of the Drupa Committee and Chairman of the Board at Koenig & Bauer AG explains. "Print 4.0 enables individualisation and personalisation in digital printing. In the face of high-quality packaging and the rapidly diversifying range of solutions in industrial and functional printing this digital networking of machines and systems offers the solution and guarantee for efficiency and competitiveness. Print 4.0 is the mega trend at Drupa 2016. This is very clear even at this early stage."

ADDED VALUE: TECHNICAL SIDE EVENTS

The programme of accompanying technical events – including the Drupa innovation park, Drupa cube, the brands PEPSO (Printed Electronics Products and Solutions), 3D fab + print and 'touchpoint packaging' – is a substantial enhancement offering target visitor groups real added benefit.

One of the most important highlight themes at Drupa 2016 is packaging production. According to current forecasts, the packaging market will grow to US $985 billion by 2018. A dedicated special show, 'touchpoint packaging' comprising some 20 participating exhibitors, reflects the relevance of this market. This special forum in Hall 12 (Stand B53) has been designed and organised in close co-operation with the European packaging design association (epda), Europe's leading association of brand and packaging agencies. To cater even better to the special needs of the various user industries, 'touchpoint packaging' is divided up into four 'future labs' namely 'food and beverage', 'non-food', 'pharma' and 'cosmetics'.

Another highlight theme at Drupa 2016 is 3D printing. The potential of these additive manufacturing technologies for any vertical markets should not be underestimated. "The spare parts' business in mechanical engineering or packaging design offers particularly great opportunities for machine producers, users but also print service providers," says Sabine Geldermann, Director of Drupa. The touchpoint 3D fab+print featured in Hall 7A (Stand C41) reflects this spectrum. As part of this special show the latest technical developments are presented here as well as visions and exciting examples of best practice. Technology suppliers and users, exhibitors and visitors, visionaries and practitioners can all meet here for dialogue and drive this exciting subject forward.

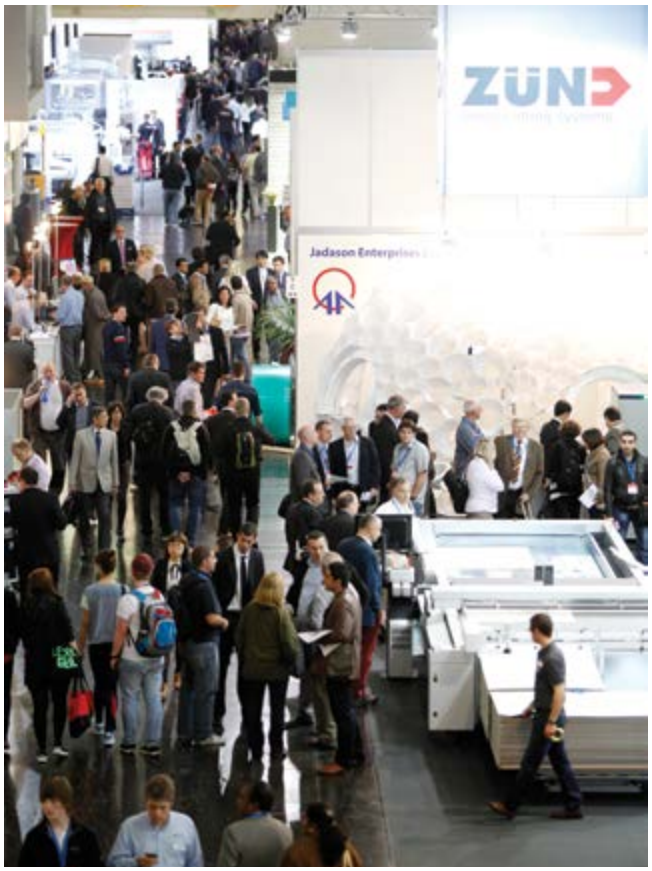
FOCUS ON FUNCTIONAL PRINTING

Another major future theme at Drupa 2016 is functional printing. Across the globe there are many application examples for printed electronics. Touch sensors on furniture surfaces, Bluetooth loudspeakers from paper or conductive inks are no longer science fiction thanks to innovative printing technology. Drupa 2016 picks up on this highlight theme not at one but several points:

1. Under the PEPSO brands various exhibitors will be represented with stands on the theme of Printed Electronics Products and Solutions.
2. The OE-A (Organic Electronics Association) covers the topic with its members at 'dip' (Hall 7.0).
3. ESMA, the European Association for Screen-printing, Digital and Flexoprinting Technologies, addresses this issue with a programme in Hall 6 (Stand C02) and Hall 3 (Stand A70).
4. And finally, VDMA (Hall 7A, Stand B13) also offers a number of activities at its 'Showcase Industrial Printing' feature.

Impulse-generating innovations and business case studies for process-driven print and publishing solutions are centre stage at Drupa innovation park, where young companies and

This year's show accommodates some 1,650 exhibitors from more than 50 countries



Drupa's motto 'touch the future' is designed to provide a platform for new technologies

start-ups as well as global players are presented with pioneering solutions. For visitors the so-called 'dip' in Hall 7.0 has the benefit of allowing them to explore trend-setting innovations, solutions and business case studies on an easy-to-manage area. Presentations, lectures and interviews at the 'dip energy lounge' round off the ranges displayed by approximately 130 exhibitors.

ENTERTAINING, EDUCATING, ENGAGING

The Drupa cube has opted for a new approach under the heading 'Entertaining, Educating, Engaging'. This event and congress programme (Hall 6, Stand D03) will centre on the innovative power of printing and the multi-faceted possible applications of printed products across a multitude of industries and spheres of life. The organisers succeeded in enlisting the multi-national The Medici Group founded and headed by CEO Frans Johannsson as an innovation partner. With his book 'The Medici Effect' Johannsson caused a tremendous stir and has been associated with thinking and acting out of the box, known since then as the 'out-of-the-box principle'. In addition to two keynotes on 31 May and 2 June the agenda will feature some 40 lectures by international experts.

Drupa is open daily from 10.00 am to 6.00 pm (on weekends to 5.00 pm). One-day tickets cost €45 online and €65 purchased at the ticket office. Three-day tickets are available online for €120 (€175 at the ticket office) while five-day tickets are €190 (€290 at the ticket office). Students and trainees pay €15 online instead of €25 at ticket offices. All Drupa tickets include free return trips to the Exhibition Centre by bus, light rail and trains within the networks of the Rhein-Ruhr (VRR) and Rhein-Sieg (VRS) transport authorities (on non-supplement trains, travelling second class). For more information on the network go to http://www.vrr.de and www.vrs-info.de. ■

Further information:
web: www.drupa.com

THE INDUSTRIAL SEGMENT IS THE RISING STAR OF PRINT TECHNOLOGY

Marcus Timson assesses the InPrint Show Market Survey 2016

Industrial print continues to be the rising star of the printing technology sector. The adoption of new technology has been consistent over the past 18 to 24 months. With the InPrint Show itself experiencing growth of approximately 30% for net meterage, visitors and exhibitors, this is clear to see. In 2015, the InPrint White Paper 'Why is industrial print booming?' outlined the key consumer and manufacturing trends that are creating the right conditions for change. The follow up white paper 'What is the future of industrial print', authored by Mark Hanley of IT Strategies, provided further headline growth forecasts per segment for ink-jet with a headline fact that there was accelerated growth of 36% for ink-jet between 2012 and 2022. This report continues the InPrint Show commitment to providing insight and analysis for industrial print technological development.

INPRINT SURVEY RESULTS – CONDUCTED JANUARY 2016 WITH 150 RESPONDENTS

Respondents came from across the globe from Austria, Germany, Sweden, Singapore, Italy, France, USA, UK, Japan, Switzerland, Belgium, Netherlands, Ireland, India, Turkey, Greece, Russia, Hong Kong, Denmark and Poland.

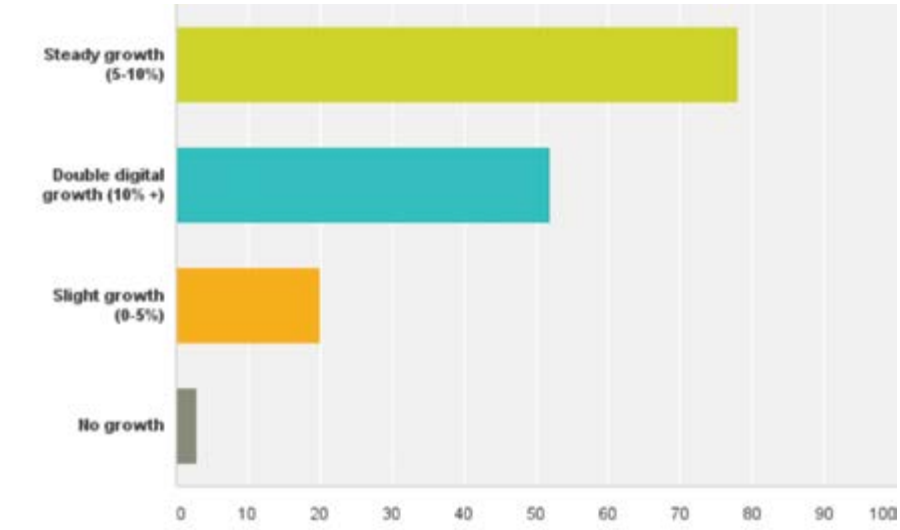
The objective with this survey is to gain insight and understanding of the pace of development within the marketplace. In addition, unearthing the key issues and discovering what kind of future industrial print technology can look forward to.

ROBUST GROWTH PREDICTED FOR INDUSTRIAL PRINT CONTINUES

Q 1) What is your prediction for growth for industrial print?

Given the strong indicators towards growth for industrial printing, it is therefore unsurprising that the overwhelming majority of respondents believe growth is 5% or above. This suggests that the technology sector is developing quickly. Nearly 34% believe this to be double-digit growth which is an increase of nearly 10% on 2014 where 25% of respondents believed growth to be 10% or above. Less than 2% believe there to be no growth.

Q 1) What is your prediction for growth for industrial print?



Answer Choices	Responses	
Steady growth (5-10%)	50.98%	78
Double digital growth (10% +)	33.99%	52
Slight growth (0-5%)	13.07%	20
No growth	1.96%	3
Total		153

DEVELOPMENT OF MARKET IS CONSIDERABLE FROM INPRINT 2014 TO 2015

Q.2) If you attended both InPrint 2014 and InPrint 2015 do you think the market and show had evolved during this time?

Visitors and exhibitors that attended both (2014 and 2015) shows clearly thought the event and the market had evolved during this time. If we remove the larger portion of people who didn't attend both events (30.93%) those who believed that the market and the show have evolved considerably is well over 25%.

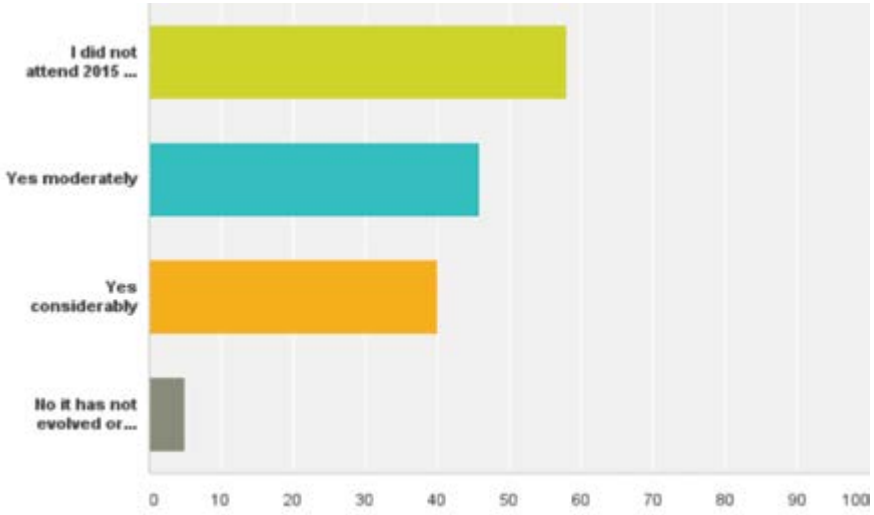
A DESIRE FOR NEW APPLICATIONS TO UNLOCK NEW BUSINESS IS KEY DRIVER

Q.3) When investing in new technology what benefit are you looking to gain?

There are a number of key benefits that the investor is looking for when acquiring new

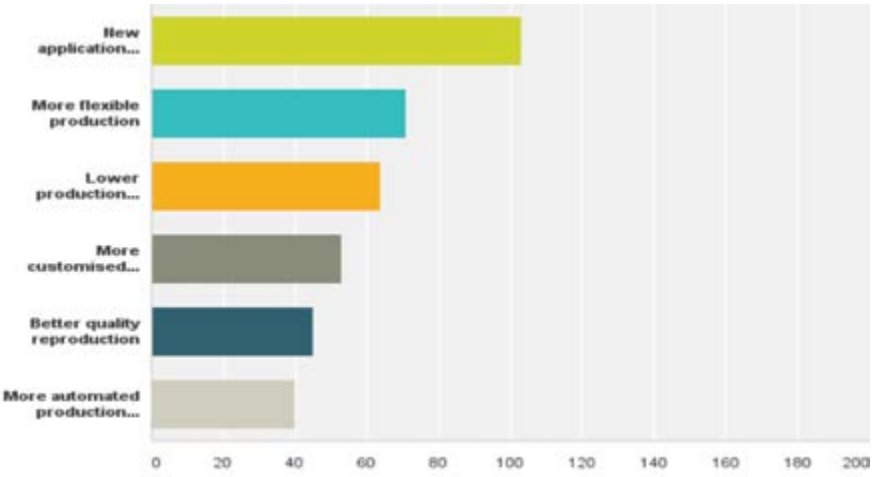
Marcus Timson

Q.2) If you attended both InPrint 2014 and InPrint 2015 do you think the market and show had evolved during this time?



Answer Choices	Responses	
I did not attend 2015 and 2014 Shows so cannot provide an answer	38.93%	58
Yes moderately	30.87%	46
Yes considerably	26.85%	40
No it has not evolved or developed	3.36%	5
Total		**149**

Q.3) When investing in new technology what benefit are you looking to gain?



Answer Choices	Responses	
New application possibilities	74.64%	103
More flexible production	51.45%	71
Lower production costs	46.38%	64
More customised production output	38.41%	53
Better quality reproduction	32.61%	45
More automated production output	28.99%	40
Total Respondents: 138		

industrial print technology. However the benefits one would consider to be perhaps the strong USPs of digital production are not necessarily the main drivers. For example, the potential for automated production with (29%) came out as the least important. However what is regarded as the lead benefit, by some distance, is the ability to print onto new applications (75%). This is perhaps due to a desire to add value, diversify or indeed open up entirely new markets. The second is flexible production, which is a key digital benefit with (51%) and lower production costs with (46%) rounding off the top three. For industrial screen-printing this suggests it has retained a high value due to its continued importance in the manufacturing process of many products. For industrial digital and ink-jet printing it is an indication of the fact that new value is being created and that this is highly valued. Therefore, lower production cost is not the main driver.

MORE OPEN COLLABORATION IS CONSIDERED A KEY ISSUE FOR CONTINUED DEVELOPMENT

Q.4) Industrial print is currently in a growth phase but what is required by the market for it to develop in the most effective way?

By some margin (72.48%), respondents believe that more open collaboration between suppliers is required in order for the market to continue to develop effectively. This is closely followed by the need for greater knowledge from the entire supply chain. Collaboration is really essential for industrial print. No one vendor has all of the answers and a number of different providers must collaborate in order for successful development to be achieved. It is clear industrial printing could benefit from more open collaborative development in order to increase effective integration into manufacturing. A high level of secrecy coupled with an unwillingness to work together could slow development.

PACKAGING, IN PARTICULAR DIRECT-TO-SHAPE, IS THE LEADING RISING STAR APPLICATION

Q.5) Which industry segments are currently enjoying most significant growth for industrial ink-jet?

These results demonstrate that industrial print in general is in a growth phase and forecasts are that this will continue.

Packaging (60%) is perceived to lead as it continues to enjoy a period of investment by suppliers to the industry particularly in relation to industrial printing. Consumer brands continue to place importance upon its position within the marketing of products and print is clearly a key technique for distinguishing and enhancing a product from

Continued over

a sales perspective. As well as product decoration and the growth of direct-to-shape printing, which is attracting plenty of attention, it should also be noted that coding and marking and security printing is also growing in its importance. FMCG brands are keen to protect their products from a trade mark perspective but also to be able to effectively track and trace for security purposes. Digital ink-jet printing affords retailers and brands the ability to manage stock levels and distribution, controlling cost, optimising sales and minimising waste.

Perhaps as exciting as textiles is the high level of respondents who believe that interior decor onto new surfaces with (47.79%) are set to make considerable gains. This is supported by the growth in decor printing particularly evident at InPrint. Further down the list, but still credible and noticeable is functional printing (29%). However despite the hype surrounding 3D printing, this is still languishing far behind all other processes in terms of real life, real time use.

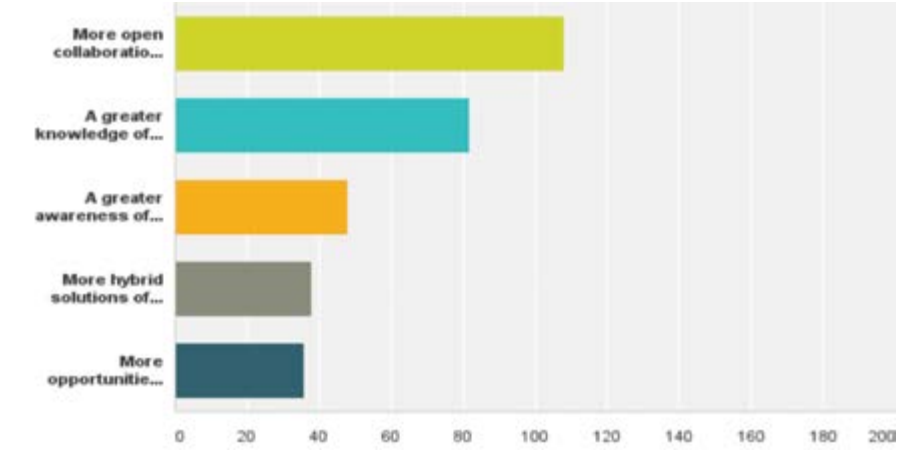
TECHNOLOGICAL INNOVATION COUPLED WITH CHANGING CONSUMER TRENDS IS CREATING CONDITIONS FOR CHANGE

Q.6) Demand for industrial print is growing, in your opinion, what are the main drivers for this growth?

Technological innovation is driving new possibilities of production in a whole host of industries. Print technology seems rather blessed in this regard to have an analogue process such as screen-printing that is particularly suited to a wide range of applications including new markets such as smart technology. In addition, ink-jet technology is maturing and becoming ripe for use in multiple applications mostly to create new value that complements rather than displaces analogue printing.

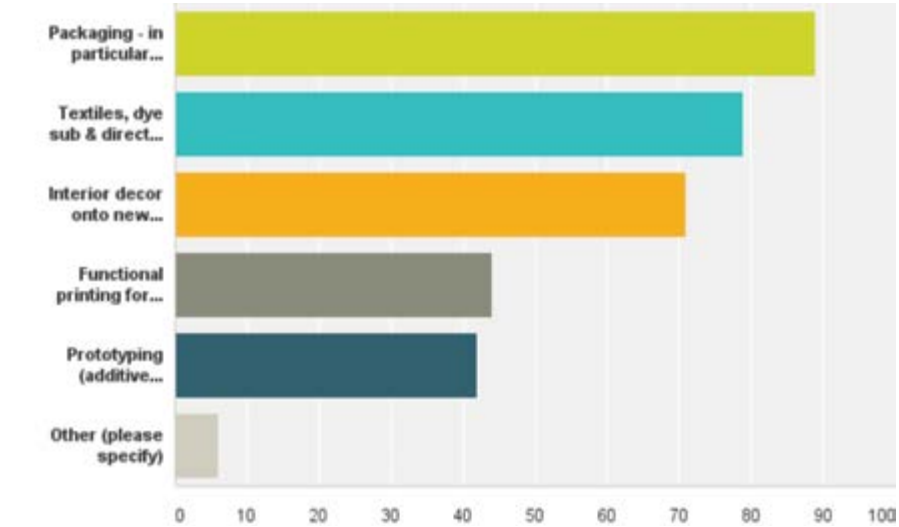
From these results, it is clear that the main drivers of change are two-fold. Technological innovation leads with (69.54%) and is a result of vendors seeking new markets, enabling new potential never previously possible. This isn't entirely digital's domain. New market formation in consumer electronics, smart technology and the inevitability that this will grow means that sectors such as automotive are pushing industrial screen-printing to meet an innovation need for smarter technology. But in order for any new technology to be adopted, there must also be a pull from the top of the supply chain, the consumer (56.29%). This climate is essential for change. New industrial printing solutions are clearly required in order to meet a more diverse and fragmented set of needs from a

Q.4) Industrial print is currently in a growth phase but what is required by the market for it to develop in the most effective way?



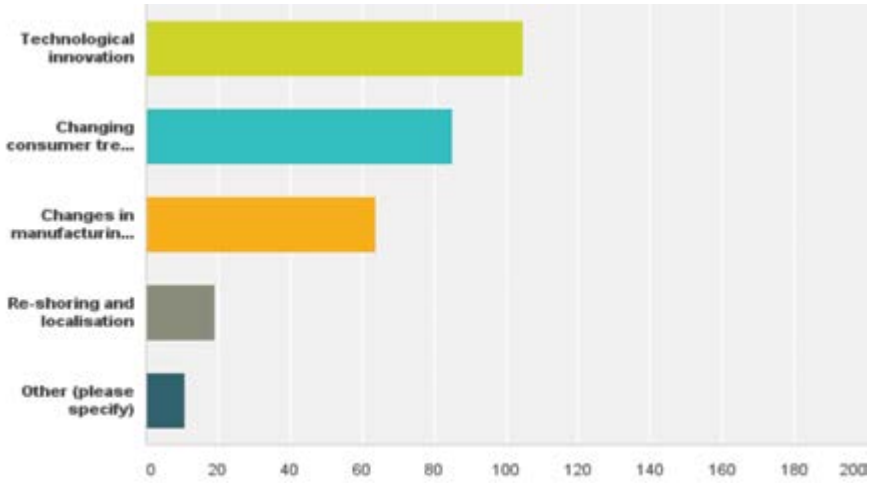
Answer Choices	Responses	
More open collaboration between suppliers (heads, inks, system integrators, printers and end manufacturers) is needed in order to best solve complex production problems	72.48%	108
A greater knowledge of industrial printing from the entire supply chain is needed for innovation to be successful	55.03%	82
A greater awareness of industrial inkjet is needed in order for adoption to accelerate	32.21%	48
More hybrid solutions of screen and digital inkjet in order to create the best solutions now	25.50%	38
More opportunities to connect with key people in the industrial print supply chain is needed	24.16%	36
Total Respondents: 149		

Q.5) Which industry segments are currently enjoying most significant growth for industrial ink-jet?



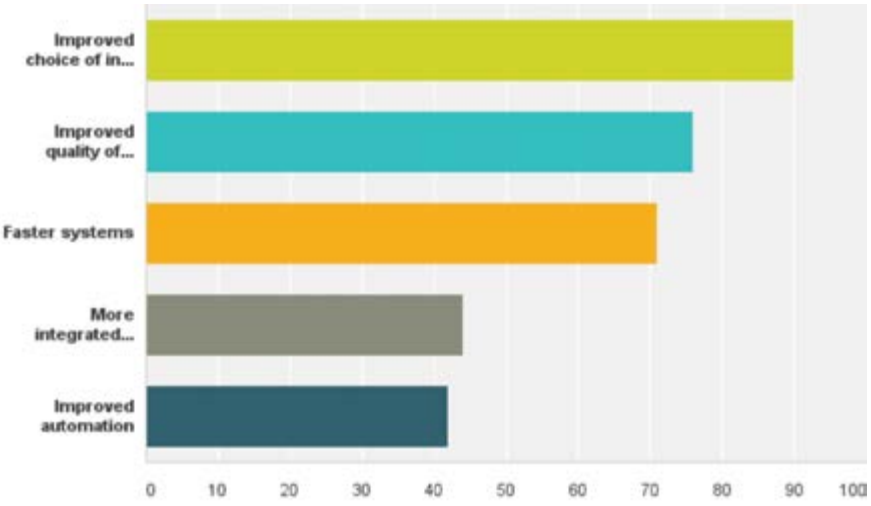
Answer Choices	Responses	
Packaging - in particular direct to shape	60.14%	89
Textiles, dye sub & direct to garment inkjet, home textiles	53.38%	79
Interior decor onto new surfaces including: wood, plastic, metal, glass, wall papers	47.97%	71
Functional printing for automotive, electronics, medical and pharmaceutical	29.73%	44
Prototyping (additive manufacturing, 3D Printing)	28.38%	42
Other (please specify)	4.05%	6
Total Respondents: 148		

Q.6) Demand for industrial print is growing, in your opinion, what are the main drivers for this growth?



Answer Choices	Responses	
Technological innovation	69.54%	105
Changing consumer trends and demand	56.29%	85
Changes in manufacturing (Industrie 4.0 and the shift to digital manufacturing)	42.38%	64
Re-shoring and localisation	12.58%	19
Other (please specify)	7.28%	11
Total Respondents: 151		

Q.7) what in your opinion is the key to increasing growth for inkjet in industrial applications?



Answer Choices	Responses	
Improved choice of inks and materials for industrial printing	60.40%	90
Improved quality of industrial printing finish (more robust, more effective printing)	51.01%	76
Faster systems	47.65%	71
More integrated technology provision	29.53%	44
Improved automation	28.19%	42
Total Respondents: 149		

continually evolving consumer who has sophisticated knowledge, taste and requirements. And this trend is particularly well suited to digital production. Not far behind (42.38%) these two key trends, a changing manufacturing segment is restructuring in order to meet a need for Industrie 4.0 and digitisation of manufacture.

DEVELOPMENT OF INKS AND MATERIALS WILL ACCELERATE ADOPTION OF TECHNOLOGY

Q.7) what in your opinion is the key to increasing growth for inkjet in industrial applications?

In order for industrial ink-jet to grow in its use it makes sense that continuing improvement of the core technology is needed. The incredibly demanding nature of industrial printing means that quality and durability must be of the highest standard. From this survey 60.40% believe the main issue is improved choice of inks and materials for industrial ink-jet. The development and growth of industrial ink-jet is clearly challenging ink and material manufacturers to adapt and innovate to meet new demands. This is not an easy task given the diversity of different applications and industries. This challenge is however being met, but this will remain a leading issue for some time to come. Industrial printing is both engineering and chemistry. So an advancement in engineering capability will not always coincide with convenient development in chemical manufacturing. Secondly, improved quality (51.01%) is deemed as important which is no surprise given the intolerance for less than perfect production. In third place are faster systems (47.65%) which are an important facet of any industrial process. Whilst these challenges are being met with the advent of single-pass systems and general improved speed and head development, for industrial ink-jet to thrive in industrial conditions, the considerable challenge of both producing high quality print at speed must be met in order for increased adoption to occur. ■

Marcus Timson is co-founder of InPrint (analysis provided by Mark Hanley, President of I T Strategies)

Further information:
FM Brooks, Leatherhead, Surrey, UK
tel: +44 1372 370 854
email: marcus.timson@mackbrooks.com
web: www.inprintshow.com/
www.it-strategies.com

STIMULATING ADOPTION OF PRINT FOR VARIOUS PRODUCTION PROCESSES

Innovation continues to embrace functional solutions

The great variety of companies and research institutes represented at the Advanced Functional and Industrial Printing conference (AFIP) proved the readiness to embrace functional print solutions across different industries. Held at the beginning of March in Düsseldorf, the ESMA event delivered an agenda packed with presentations, networking moments and inspiration both for suppliers and end users in the automotive, electronics and healthcare sectors.

Organised for the third time in its current guise, the AFIP conference is already an established brand on the industrial printing market and yet its formula leaves enough room for innovation and keeps on attracting many newcomers. The agenda opened with the real case scenario by Quad Industries which now employs screen-printing in the manufacturing process of flexible batteries and smart textiles but also in temperature loggers for medical and pharmaceutical applications.

Rated as the best presentation of the conference, Quad was closely followed by other keynotes, Professor Long Lin from University of Leeds (an overview of functional materials for anti-counterfeit applications and conductive inks for textiles) and Professor Arben Merkoçi from the Catalan Institute of Nanotechnology. Although it might have appeared distant from the printing domain, Professor Merkoçi's speech on bio-sensors for diagnostics was extremely well received and widely commented by the delegates.

One of the AFIP networking moments

A packed conference room for AFIP

FULL CONFERENCE PROGRAMME

Altogether 21 presentations by both screen-printing and digital printing orientated speakers filled the conference programme and, in the words of Marvin Waldinger from Rathgeber GmbH, provided: "an in-depth view of the progress made in the last years regarding functional printing and those who contribute to it". Piet Blomme from Clicktouch NV described AFIP as an "all-in-one event" where "new printing products, techniques and challenges were explained within 1.5 days". More explanation and discussions took place during multiple tabletop and networking sessions and lasted long in the evening during a splendid networking dinner.

From the perfect screen preparation or advancements in ink-jet technology, through speciality effects and conductive inks, to printed electronics, automotive and medical applications, AFIP 2016 served every attendee with content useful to their developments in niche markets or with stimulation needed to enter production of industrial volumes. By many considered as the key contribution to their technology roadmap, the conference continues to unite representatives of various market sectors. Gregory Gentile from Apple Inc. summed it up as: "an excellent mid-sized venue that focuses on new technology rather than sale of products. A great environment to learn and exchange ideas."

All conference presentations are available as PDF files. Please write to info@esma.com if interested. AFIP 2016 in numbers:

- 21 presentations
- 25 tabletop exhibitors
- 135 attendees from 20 countries
- 72% delegates declared key interest in printed electronics, 65% in screen-printing, 63% in inks and 53% in digital printing ■

Further information:
web: www.esma.com

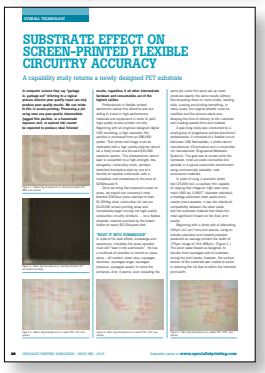
INDEX TO DISPLAY ADVERTISERS

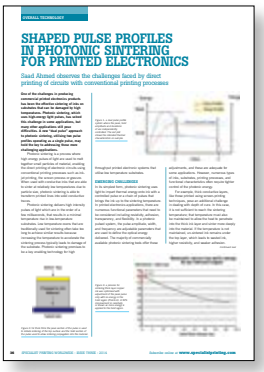
AGFA....67
BELTRON GmbH....13
Chromaline Screen Print Products....33
Douthitt Corporation....9
Easiway Systems....59
EFI....5
ESMA....62
EXTRIS....27
Fimor....19
Gallus Ferd Ruesch AG....21
Grünig-Interscreen....Front Cover & 3
Inkcups Now Corporation....19
ISIMAT GmbH Siebdruckmaschinen....25
J-Teck3 Srl....39
K-Flow GmbH....7
KBA-KAMMANN GmbH....11
Kiian Digital....57
KIWO, Kissel + Wolf GmbH....Outside Back Cover
MacDermid Autotype Ltd....51
Marabu GmbH & Co KG....49
Mimaki Europe....Inside Front Cover & 1
Murakami....31
Natgraph Ltd....15
Phoseon Technology....17
Premier Textiles Ltd....45
PVF-Vertriebs GmbH....47
Roland DG Benelux nv....41
Sefar AG....21
Sensient Imaging Technologies....29
SGIA Expo 2016....45
SignTronic AG....Front Cover & 3
SPS® TechnoScreen GmbH....35
TECHNIGRAF GmbH....61
The IJC....62
Zünd Systemtechnik AG....43

SUBSCRIBE NOW to receive future copies of the industry's leading international reference source

If you're a user of screen or wide format digital printing systems from anywhere in the world, subscribing to *Specialist Printing Worldwide* will ensure that you are kept up-to-date with the latest technological advances throughout the industrial, graphic and textile sectors.

SPECIALIST printing worldwide





To receive the next four issues (covering 12 months) at the total cost of only €58 / $84 / £48, subscribe at www.specialistprinting.com or return the order form below to email subs@specialistprinting.com or fax +44 (0)1342 322664.

Company name: .....

Your name: .....

Address: .....

.....

Tel: ..... Web: .....

Email: .....

Powerful variety

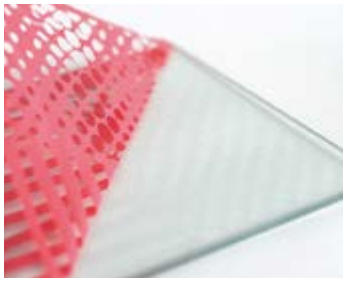
Stencil-making chemicals · special adhesives · resists & coatings for surface finishing **by KIWO®**

Top quality photoemulsions

and stencil-making chemicals for every screen-printing job

Special adhesives

solvent, water or UV-based; for graphic and industrial applications



Resists & coatings

for technical, graphic and protective applications

Please get in touch today or see us at

drupa: hall 3, booth B71-1

KIWO

products · concepts · solutions

KIWO – Kissel + Wolf GmbH · In den Ziegelwiesen 6 · 69168 Wiesloch · Germany
Phone +49 6222 578-0 · Fax +49 6222 578-100 · info@kiwo.de

www.kiwo.de