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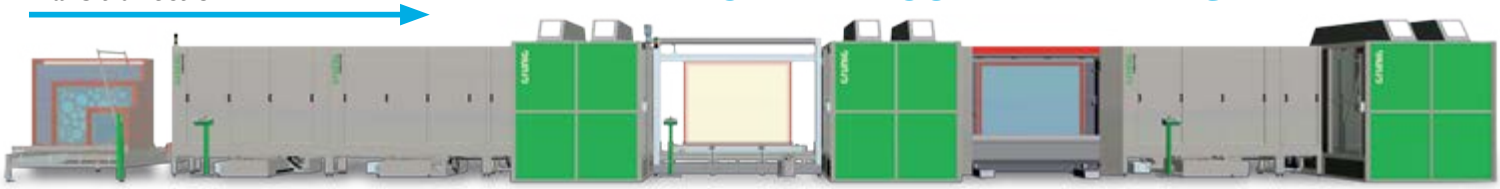

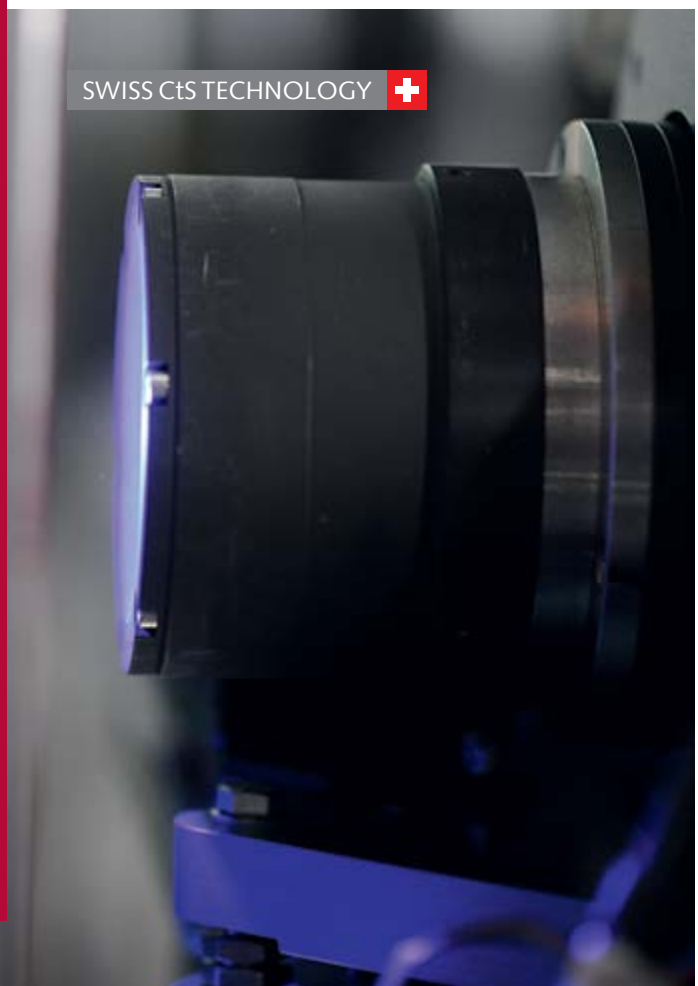

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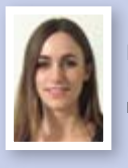

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We chose this picture as we felt it perfectly symbolises how each and every one of us is coming together in our industry at this difficult time. Working together we will overcome these challenges and succeed!

CONTENTS

Welcome • Benvenuti • Bienvenue • 欢迎您 Willkommen • Bienvenido • Добро пожаловать

What troubled times we are all living through. We each have our own special challenges with our families, our friends and our businesses. Here at *Specialist Printing Worldwide* we are working hard to continue to reach all of you through our online and printed editions and will continue to do so. Whilst we are fortunate our printer is still operating, we are very conscious that not all businesses are so fortunate and are facing massive disruption to their normal operations.

I know that Nicola, our Publisher, has talked to many of our advertisers and is helping them to stay visible in the marketplace and I am sure that each of you will have your own contingency plans in place to at least keep the wheels turning and in turn help your own customers. We will continue to supply you with excellent technical articles to help with running your businesses and are always pleased to hear from any of our readers if they have a special need for information which may be of general use to printers in their field.

It is at times like this that we realise what a great family we have in our industry with the people in each company always ready to help those who may be in difficulty. It crosses all boundaries and is truly an uplifting sector to be working in.

May I wish you, your families, friends and fellow workers good health in the weeks ahead and look forward to seeing you at trade shows once they start again.

Bryan Collings, Publishing Director

GRAND DESIGNS

Inkjet has a lot to offer the décor market, and there are indications its day may have finally come. John Corrall has some thoughts to share

Managing Director of Industrial Inkjet, John Corrall

Inkjet is hardly new in the décor market. The ceramic tile market changed over to inkjet almost overnight around the time of the 2008 financial crash. Tough times mean people have to look carefully at their business. The market realised that the economics of inkjet made sense, and suddenly no tile producer could afford to use any other technology. Rotary screen died and inkjet quickly came to dominate.

Now some 12 years later the tile market is very mature, with all production lines long since converted to inkjet. Machine sales into this market are all about replacements or upgrades. Ceramics machine builders are now looking to move into other markets such as packaging, textiles or '3D' ceramics such as tableware.

What about the rest of the décor market? The key areas inkjet suppliers are targeting are:

- wallpaper
- laminates (e.g. HPL)
- LVT
- edge band
- furniture direct-print

WALLPAPER

This market has real potential. The vast majority of wallpaper is produced on large conventional presses. Set-up times are long, waste is high and a 600mm image repeat distance limits design possibilities. Digitally printed 'mural' wallpaper exists, but it is a tiny fraction of the whole, largely limited by the low speeds of the wide format machines used to print it (dominated by HP Latex printers). To capture this market the goal is digital print at full press speeds (60–70m/min). The problems lie in the ink. There are tough EU regulations to meet, a wide range of wallpaper stocks to print and low cost/m² targets. Once these issues are solved there are 300 'analogue' wallpaper production lines to replace, and this might total 1000 including Asia.

LAMINATES

High Pressure laminate is used for furniture, flooring or exterior cladding of buildings. It consists of a sheet of printed paper soaked in resin (melamine) and bonded under heat and pressure to a board. The board may be particle-board, MDF or itself made from multiple layers of resin-soaked paper.

Inkjet is already used to print the paper sheets. Inks may be UK or water-based. A key requirement is that they don't fade when exposed to heat (e.g. from a hot pan placed on the furniture). Board producers also expect linear print speeds of 50m/minute minimum and print widths around 2.1m (so these are not small machines). Inkjet machine builders in this market are Palis, KBA and Hymmen.

'Use of digital print in laminates production opens up the market to much wider design possibilities'

Example of an edge band – the strip of colour-matched tape often found on the edge of furniture

Industrial Inkjet's Colour Print 562 print engine is one of the company's largest print widths, used mainly in wide web or sheet fed applications such as security printing, décor print or packaging

LUXURY VINYL TILE

LVT can look like wood or ceramic tile flooring but is warm underfoot and easier to fit. With any large area of print the human eye will quickly pick out any repeated patterns, so inkjet has a big advantage in that the printed images don't need to repeat. From this point of view, it can look far more 'natural' than conventional print. LVT normally consists of two or more layers of PVC and for durability the print is on the inside – either on the rear of the clear top layer or on the top surface of the second layer. The main issue is to ensure that the inkjet print does not weaken the bond between the PVC layers. Normally no adhesives are used – the layers are joined using heat and pressure. But normal inkjet inks can act as a barrier and prevent good adhesion between the layers.

EDGE-BAND

While the top surface of say, a table, might have been printed by high pressure laminate (HPL), the edges also need decorating to match. Generally, this is done using 'edge-band'. Edge-band is most commonly printed ABS [Acrylonitrile Butadiene Styrene] that is then glued to the edge of the board. The edge-band is printed in widths of 300–500mm on a roll to roll system and slit to the required width. Inkjet inks are normally UV type.

After slitting, the cut edge is visible, [so] it is normal to use pre-coloured plastic. For this reason, the inkjet may not be working very hard – typically it may be simply adding a wood-grain pattern on top of light-brown plastic. Colour matching of the edge-band to the rest of the board requires care. Even if the colour match is accurate, differences in gloss level between the top and sides of the board may be unacceptable. Metamerism issues [colours appearing different under different lighting conditions] also arise. So even if the board top and sides have an accurate colour match in daylight conditions, do they still match under LED or fluorescent lighting?

Agfa Graphics is very active in this market. Its PID ink set is low-metamerism and includes additional colours aimed at duplicating 'wood' images.

Industrial Inkjet installed its first system for edge-band production back in 2011.

DIRECT TO BOARD

Use of digital print in laminates production opens up the market to much wider design possibilities. But the true goal of any just-in-time manufacturing system is always to leave the customisation until the end. Printing onto laminate papers with inkjet doesn't help much – since the paper must be printed right at the start of the manufacturing process. The decision about what image to print (which must also be matched by the edge band) must be made before board production starts.

The ideal then would be to manufacture and stock plain, unprinted boards and decorate them only as required. In other words, the digital print system is printing directly onto an otherwise finished board. The image to print can be chosen at the last moment and can vary continuously to avoid pattern repetition.

Again, this is not a new idea. Spanish machine builder Barberan showed their first inkjet system for board printing in 2008. Cefla is another recognised name in this market.

Ideally, print systems need to print both the top and sides of the board together and with the same inks – so avoiding any colour-match or metamerism issues. When printing onto a large area such as a length of kitchen worktop, the accuracy of the board transport system becomes critical. Any errors in the smoothness of the movement will result in visible 'bands' in the print.

The next step after printing flat panels is then to print onto 3D furniture, e.g. chairs. While the same issues apply in terms of inks and accuracy of motion, a further difficulty is the limited ink 'throw' distance available from the inkjet printheads. With complex 3D shapes – especially concave shapes such as a chair backrest – it is difficult to get the inkjet printheads close enough to the surface to be printed. Inevitably some compromise is needed between using small ink drops for high print quality and larger ink drops which will 'fly' further.

'Inkjet technology has already made inroads into the décor market, increasing design possibilities and reducing economic batch sizes'

Inkjet technology has already made inroads into the décor market, increasing design possibilities and reducing economic batch sizes. Arguably late-stage customisation by direct-to-board printing will take this to another level. ■

John Corrall is Managing Director of Industrial Inkjet

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SPACE INVADERS

What is the holy grail of colour measurement? Rick Auterson examines three-dimensional colour space models that help users to avoid expensive mistakes

Choosing a method for expressing colour difference is a crucial decision for printing companies serving retail brands. It impacts their bottom line. To talk about colour, you only need a few words from the colour vocabulary. But to make sound business decisions, you need a profound understanding of every word you say.

Let's start by discarding equations. You do not need to understand the maths. I won't even show it to you. That sort of thing is useful to a handful of people who use far better references. All you need to know is that those equations describe shapes in three dimensions. I figured that if I could make those shapes visible, people could learn from just looking at them.

'The difference between two colours is called delta E'

I used Virtual Reality Modelling Language to map colours in three dimensions, and ringed them in wire frames to represent various colour difference methods.

The first time I looked around in one of these colour space models, I was surprised. I should not have been. I've been working with these equations for years. I thought I already knew everything. Well… I learned some fundamental truths about colour. I showed them to Mike Ruff, of Mike Ruff Consulting, and he was surprised. He should not have been. Mike actually does know everything. He said, "Imagine that."

The three-dimensional models presented here are available online. Take a deep dive and look around. You will emerge with a better understanding of colour than the experts. Besides, it's kind of fun.

HERE'S WHAT HAPPENED

In the late 1800s, the industrial revolution kicked into high gear and caught us unprepared. It demanded colour. Surprise! We had no way of measuring colour – darn it.

As it turns out, measuring colour is not that hard. Just scatter the light into its component wavelengths and measure each one. We could even compare one colour to another – and report the difference at each of three hundred wavelengths. Well… that's awkward. We needed a colour space.

The hunt began in earnest for the holy grail of colour measurement, a colour space, where, when two colours are plotted in three dimensions, their relative difference in appearance is equal to their relative distance apart. Sounds simple? We still have not figured out how to do that.

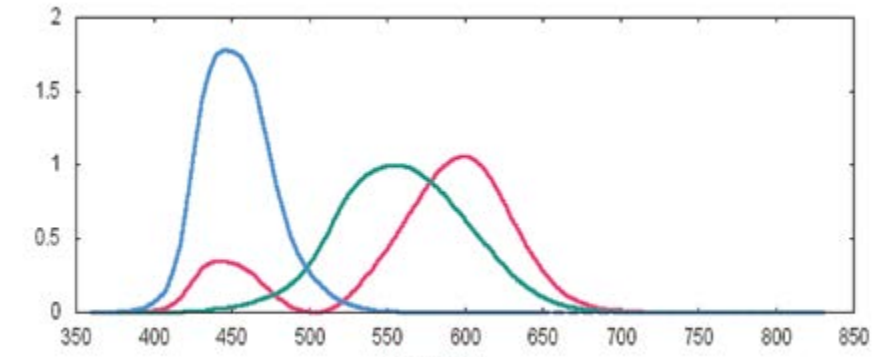

Figure 1: red, green and blue cones

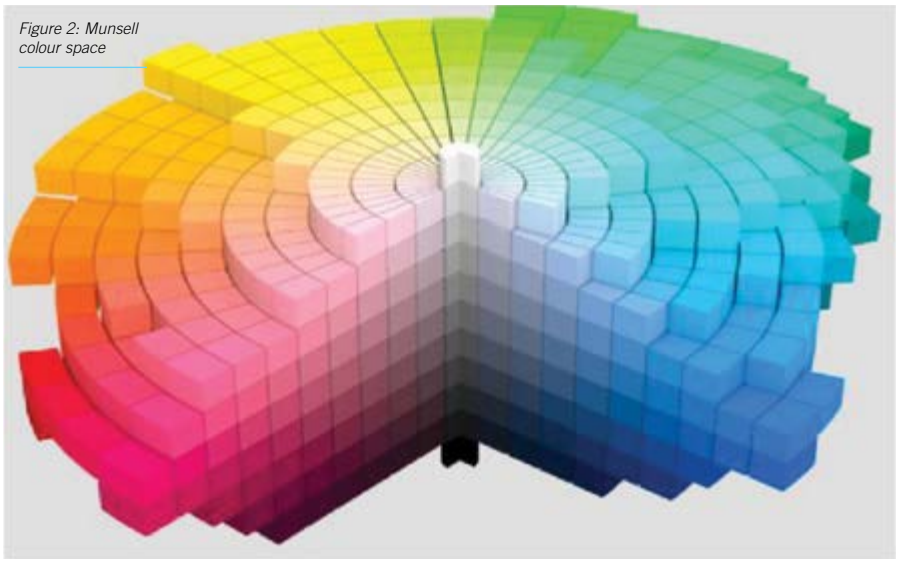

Figure 2: Munsell colour space

The difference between two colours is called delta E, often shortened to dE or ΔE. The little d and Δ both mean, difference. I'll stick to dE, just because there's a d on my keyboard. The purpose of delta E is to help us define an acceptable amount of colour change.

Over the years, the calculation of dE has steadily become better. But it left in its wake a series of incremental improvements. Knowing the difference between a few flavours of delta E will help you avoid potentially expensive mistakes involving colour.

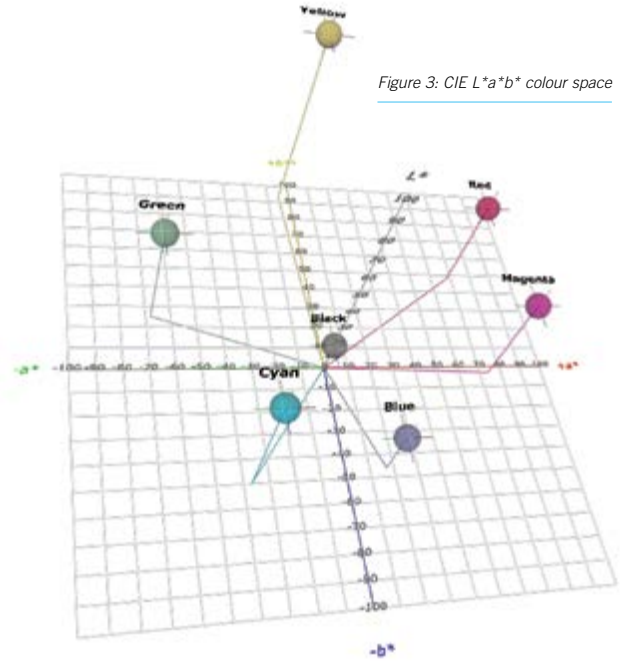

*Figure 3: CIE L*a*b* colour space*

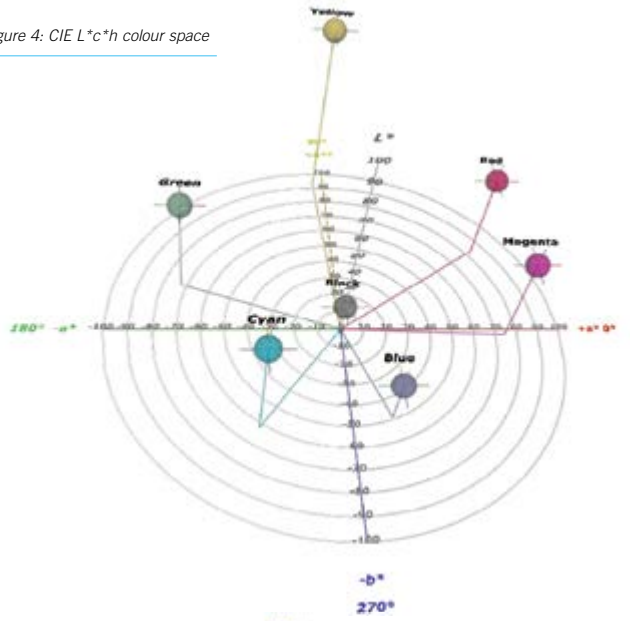

Figure 4: CIE L*c*h colour space

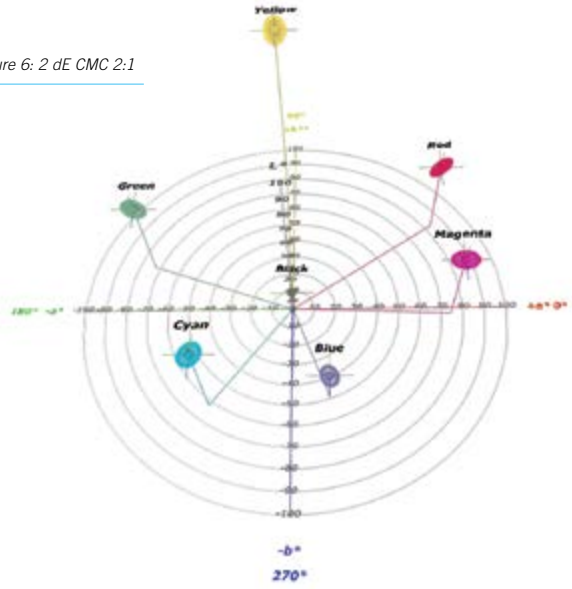

Figure 6: 2 dE CMC 2:1

Since the middle of the 1800s, people have known that the human eye has red, green and blue cones. By 1910, RGB had prompted some genius to make CMY inks. So, for decades, people tried to create a colour space with red, green and blue axes. No matter how they worked it, an RGB colour space does not agree with what people see.

Notice, illustrated in **Figure 1**, that the red cones in our eyes have

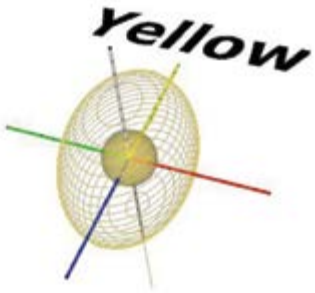

Figure 7: yellow at 2 dE CMC 2:1

Figure 8: greys and yellows in dE CMC 2:1

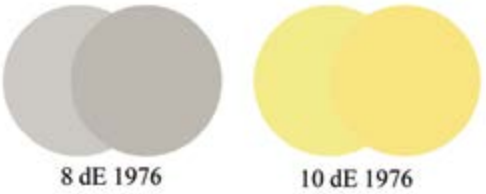

Figure 5: greys and yellows in dE 1976

problems. They react most strongly to red light, but they also react a little to blue. Blue and green cones are normal. But, again, the red cone is causing a problem. Red and green cones overlap quite a bit and share a lot of wavelengths, so we see an abundance of yellows.

Blue is the good cone, peaking a respectable distance away from the others and reacting strongly to a narrow band of wavelengths. Blues would be perfectly predictable – if the red cones were not whispering that blues are red.

Our red cones are weird; they react to nearly every visible wavelength, at least a little. Among mammals, only primates have them – presumably because red is the colour of sugars, so they can see ripe fruit. Hunters can wear those blaze orange vests because a rabbit or a deer cannot tell orange from green. Birds have red cones, but theirs

Wearing an orange vest to a duck hunt is a fashion faux pas

are normal, not like ours. Birds see reds better than we do. Wearing an orange vest to a duck hunt is a fashion faux pas. Anyway, people have these odd red cones, and they do have advantages, but they mess up what could have been a perfectly orderly and predictable colour space.

MUNSELL'S MODEL

In the first decade of the 20th century, Albert Munsell, an art teacher, worked the problem backwards. He created a three-dimensional colour space by arranging coloured blocks at just-detectable changes in colour. He did this by asking people what they saw and arranged the colours accordingly.

When Munsell completed his model, people were surprised. Just look at it, right there in **Figure 2**. There's a chunk taken out to show lightness and chroma, but that is what people see and yellows occupy a quarter of the colour wheel. Imagine that.

Munsell created a colour space based upon what people see. It has four axes: red, green, blue and new to the club, yellow. The abundance of yellows caused by red cones and green ones sharing so many wavelengths was accounted for. Munsell's model went into use in the 1910s and is still in use today.

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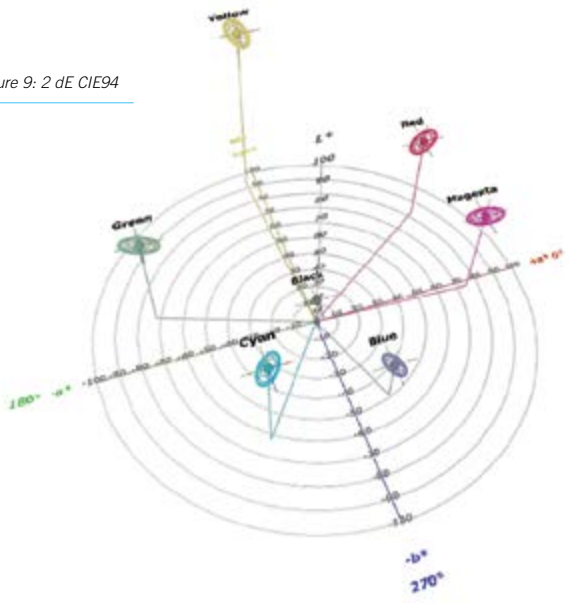

Figure 9: 2 dE CIE94

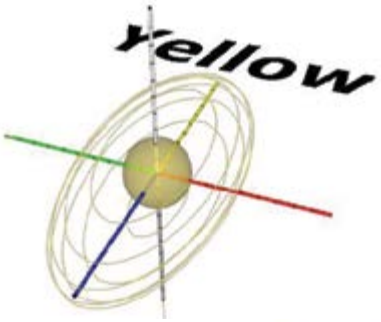

Figure 10: Yellow at 2 dE 1994

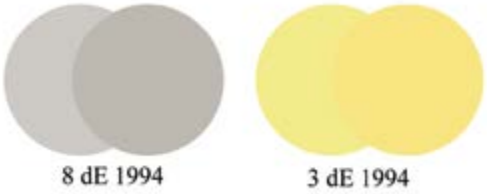

Figure 11: greys and yellows in dE 1994

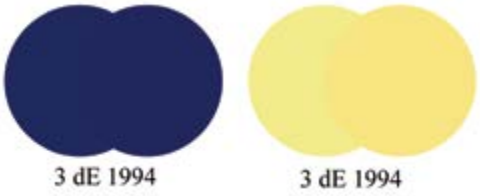

Figure 12: blues and yellows in dE 1994

CIE L*A*B* COLOUR SPACE

In 1976, the Commission Internationale de l'Eclairage (CIE), released the CIE L*a*b* colour space. Only slight revisions were made to Munsell's model. To understand what CIE L*a*b* colour space looks like, we need some colours. We'll use the CRPC-6 sheetfed offset colours—for no other reason than it gives us a wide range of colours to look over and printers are familiar with them.

As shown in **Figure 3,** CIE L*a*b* colour space is three-dimensional. The L* dimension, representing lightness, is up and down. When a* is positive, the colour is red. When a* is negative, the colour is green. When b* is positive, the colour is yellow. When b* is negative, the colour is blue. The CIE L*a*b* colour space was shaped by what people see, so red-green and yellow-blue are opposing colours. There is no such thing as a reddish green or a bluish yellow.

The distance between any two colours in this new colour space was called delta E. In **Figure 3**, using the 1976 colour difference method, a sphere with a radius of 5 maps out the points that are 5 dE from the target.

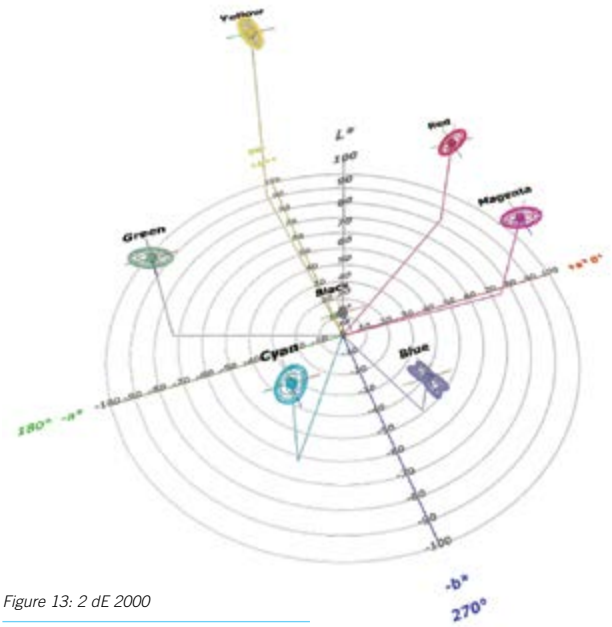

Figure 13: 2 dE 2000

In **Figure 4**, the colour space is labelled in terms of chroma and hue. Hue is an angle, with the red axis at 0°. Chroma is the distance from the centre. I just added the angles and drew circles on the floor instead of a grid. CIE L*a*b* and CIE L*C*h are the same thing. If you were giving directions to red, you could say, go 68 on the red axis, then go 48 on yellow. Or, you could say, take a heading of 35° and go 83. Both ways take you to the same place – the same colour. Either way, once you get there you have to go 47 straight up, to represent the lightness of that red. Should the need arise, there are online calculators that convert L*a*b* and L*C*h back and forth.

'Those greys look more than twice as far apart as the yellows'

Well… the 1976 colour difference method doesn't work. In **Figure 5**, both pairs of colours are about the same distance apart in colour space, so their relative difference in appearance should be about the same. I'm close to passing those yellows, but the greys are off.

COLOUR MEASUREMENT COMMITTEE

In 1984, the Society of Dyers and Colourists, released a standard for colour difference based upon hue and chroma. They had come to terms with the colour space problem. They gave up. They stopped trying to make the perfect colour space and tweaked the calculation for delta E instead. From this point on, the distance apart in colour space would no longer be delta E. And when someone said delta E, they had to specify which method was used to calculate it.

They named it after themselves, the Colour Measurement Committee, so CMC l:c. The little l and c, are weights given to lightness and chroma. In general, CMC 2:1 is considered acceptable and CMC 1:1 is considered perceptible. It's a bit of a problem, making it adjustable like that. Honestly, I don't get the whole perceptible and acceptable thing. You still have to agree upon a delta E.

As shown in **Figure 6**, CMC creates ellipses around the targets, pointing to the centre. The ellipses are longer than they are wide, so

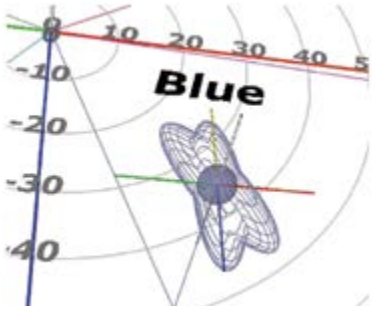

Figure 14: blue at 2 dE 2000

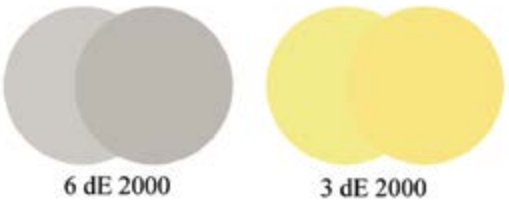

Figure 15: greys and yellows in dE 2000

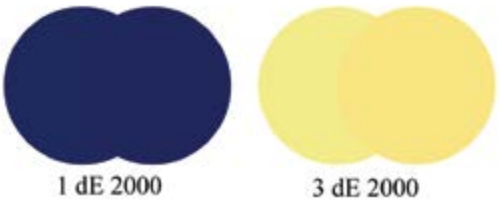

Figure 16: blues and yellows in dE 2000

CMC allows less change in hue than chroma. The size of the ellipse depends upon the colour. The spheres have a radius of 2. The wire frames around them map out the points, at which, the colour is 2 dE CMC 2:1 from the target. Look how narrow red is. That says we pick up changes in the hues of reds better than anything. Is that true?

Let's zoom in on yellow. In **Figure 7**, while dE CMC does not have an actual size of 2, it does have a size and is shaped like an M&M. The sphere at the centre has a radius of 2, so for this yellow, dE CMC 2:1 is larger than dE 1976.

Does it work? According to dE CMC 2:1, the greys in **Figure 8** are a better match than the yellows. Well… good try fellas. At least you are not still telling me those yellows are 10 apart.

CIE DE94

In 1995, the Commission Internationale de l'Eclairage, released the CIE dE94 colour difference method. I usually put a 19 in front, so dE 1994, just for consistency's sake – a slight Y2K issue.

In **Figure 9**, you can see that the ellipses got longer, so dE 1994 allows more change in chroma than CMC. Note that the red ellipse got fatter, allowing more change in the hue of reds. I'm in agreement with that.

Let's go down there and have a closer look at yellow. In **Figure 10**, we see that dE 1994 is flattened compared to CMC, so it allows less change in lightness. The shape is exactly as thick as the sphere within it. Every colour but black is shaped like a flattened football, all the same thickness and all pointing to the centre. dE 1994 does not correct for lightness. It assumes the 1976 colour space got changes in lightness right. In **Figure 11**, those greys look like they're more than twice as far apart as the yellows.

Well… it did not take long for people to realise the lightness thing isn't right. And it has trouble with blues.

In **Figure 12**, both colours are redder by the same amount. I can't tell those blues apart, but I can clearly see a difference in the yellows. When we look at a deep blue, our blue cones shout out, "BLUE!" And our red cones say quietly, "That's red."

CIE DE2000

In 2000, the Commission internationale de l'éclairage, released the CIE dE2000 colour difference method. In **Figure 13**, the first thing that jumps out is blue. What's going on with blue? Let's go down there and have a look.

In **Figure 14**, blue is two footballs joined together. The red cone's odd habit of reacting to blue light has its own ellipse – pointing at red. All the saturated colour is still footballs, but they have varying amounts of air in them. Yellow is fully inflated.

The delta E values in **Figure 15** look pretty good, but what about the blue problem?

From the looks of **Figure 16**, dE 2000 correctly predicts differences in appearance.

Good job CIE! Party at Mike's place.

CONCLUSION

There are three things you should take from all this:

- CIE L*a*b* is not a perfect colour space, but we are still using it.
- CIE L*a*b* and CIE L*C*h are the same thing.
- The dE 2000 colour difference method agrees with what we see.

All the rest is just a story about colour. ■

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Example of latex wrap. A search for 'vehicle graphics' and its variants on Instagram will bring up around half a million posts

THE #INSTA INK

As the technology moves into its second decade, Jane Rixon explains how latex ink meets the industry's demands in 2020 and why it's the perfect ink for modern customers

The printing market has changed enormously over the last decade. The rise and rise of online ordering has put more power in the hands of the end user; a customer can purchase a banner for an event or a set of retail window graphics almost as easily as ordering a takeaway. The plethora of print options is also more accessible to the public, in vibrant (and often filtered) colours.

Print Service Providers (PSPs) can post their projects on their own social media channels to showcase their incredible creativity in real time, while their customers are more than happy to show off their new printed products too. Search for 'vehicle graphics' and its variants on Instagram and you'll find around half a million posts with the hashtag. This means PSPs have to be prepared for demanding customers placing unusual orders – they've seen what they want in a photo taken 5,000 miles away and they want the same thing – so they need the equipment that can do the job.

Customers also want to buy all their products in one place. Becoming a one-stop-shop has been the goal for PSPs for decades, always trying to keep up with an ever-expanding array of printed items and exploring opportunities for vertical integration. Personalisation remains a huge market – there will always be an appetite for a unique item – while colour and aesthetic trends change on an almost weekly basis. Furthermore, customers want their purchases now: same- or next-day delivery is no longer something only fashion retailers need to worry about.

Meanwhile, consumers are also holding more businesses to account. The public is demanding values and transparency, especially regarding sustainability and social responsibility, and any brand that fails on these points is liable to receive negative exposure. Customers also want the lowest possible price and have the means to shop around at their fingertips. In short, PSPs need to be able to say 'yes' to everything.

HP's Latex 3600 3.2m industrial printer

AN INK FOR MODERN CUSTOMERS

Developed over a decade ago, latex ink has come into its own to meet these demands. The ink is 60% water, which is used as a vehicle to carry pigment in a latex polymer and then to jet it through a printer's printheads. The printer uses heat to evaporate the water, activate the polymers and bind the pigments and substrate together. This water-based chemistry makes latex inks more environmentally sensitive than solvent inks, for instance by not changing the recyclability of the printed substrate – it can be processed in the same recycling stream

'PSPs have to be prepared for demanding customers placing unusual orders'

as a non-printed material. Latex also offers a greater material compatibility than solvent inks, delivering excellent results on more sustainable materials such as fabrics, biomaterials, papers and recyclable plastics like HDPE and Tyvek. In addition, work printed with latex does not need to be laminated to achieve reliable outdoor durability of up to three years.

Moreover, the water-based nature of latex means this ink is rated A+, very low emission, for VOCs. This protects printer operators from poor air quality without the need for ventilation or air extraction in the print room,

The HP Latex 1500 (3.2m superwide printer)

which will have a comfortable, odour-free working environment. This benefit, crucially, is passed on to the end user: latex-printed work is suitable for sensitive environments such as hospitals, schools and homes – unlike solvent.

This expands the marketplace for PSPs, who can target new customers with the knowledge that their output is safe.

It is also fast – latex prints are immediately touch-dry, enabling same-day turnaround on

Continued over

The HP Latex mobile app provides remote monitoring capabilities for HP Latex printers

Latex prints are immediately touch-dry, enabling same-day turnaround on orders

orders. The quality is high on a wide variety of materials and products too. Businesses have invested in latex technology for the digital production of wallpaper – for one-off designs

'Linking the end user, the business and the hardware itself maximises the potential of latex ink technology'

and short runs of purely digitally produced rolls, and in combination with analogue techniques; to accelerate the production of vehicle wraps; to remove vinyl from the sign-making process by printing directly to substrates; to broaden their portfolio to offer white window graphics; and to speed up production across dozens of other applications.

PIONEERING LATEX

HP has pioneered the development of latex printing technologies, thanks in part to its expertise in thermal printheads and to its R&D in number of sustainability segments such as recyclability. The latest range, the HP Latex R Printer Series, features white ink that is compatible with wood and acrylic to further boost a PSP's potential application range. The ability to offer the widest choice of colours on the broadest range of applications can only help a business meet its customers' demands. Typical applications therefore include outdoor signage, hoardings and event banners, POP and retail displays, vehicle wraps, floor and window graphics, backlits, textiles and interior decor such as canvases, window blinds and wallcoverings.

Indeed, HP Latex inks are certified Greenguard Gold at the highest level, meaning they are officially safe for use in entire rooms – for instance floor to ceiling wallpaper – even in domestic and healthcare settings. By comparison, most UV and solvent output may be only certified for a one-wall mural or decal. Such is Latex's suitability with wallpaper and other home decor products, HP has developed the HP WallArt Suite, a cloud-based solution that connects PSPs' ordering systems directly with consumers.

Similarly, to help users get the most flexibility out of its Latex solutions, HP has developed a print and cut solution that combines an HP Latex printer, an HP cutter, HP FlexiPrint and Cut RIP software and a series of cloud-based applications that are accessible to both print suppliers and their customers. Linking the end user, the business and the hardware itself maximises the potential of latex ink technology.

As the printing industry develops, businesses need technology that ticks a lot of boxes. ■

Print & cut solutions, such as the HP Latex 335, help users to maximise the potential of latex ink technology

A hybrid printer with both roll and rigid capabilities, HP's Latex R Series features white ink that is compatible with wood and acrylic

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NEW WAVE

Are water-based pigment inkjet inks the next wave in industrial printing? Marc Graindourze discusses the benefits of aqueous inks for inkjet printing

Water-based pigment inks for inkjet printing have gained traction as high-performing, environmentally friendly, safe, and cost-efficient inks, so what is the potential for aqueous inkjet printing?

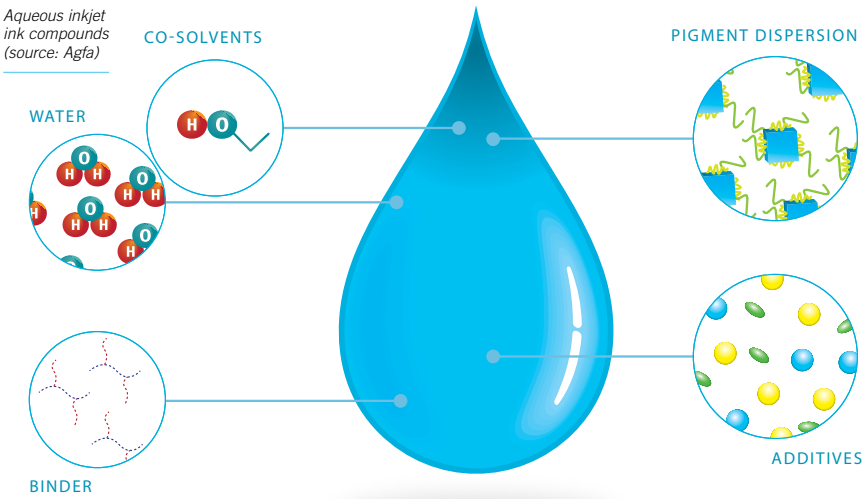
UV inkjet will stay the preferred printing technology for several applications for many years, but water-based inkjet is the challenger and will grow when it meets the requirements in terms of image quality, durability and cost. Aqueous ink technology has improved strongly in recent years and allows for consistent performance thanks to a well-aligned ink-print system approach.

BENEFITS OF AQUEOUS INK TECHNOLOGY

Firstly, aqueous inks are versatile: they can deliver high-quality prints for a range of applications. This includes porous substrates, such as papers, corrugated boards, and cardboard. We opt for pigmented inks because they are more durable than dyes, offering better light- and water-fastness. They deliver a high colour coverage, and they can be used to print great designs without surface relief, thanks to the thin dried layer.

Furthermore, aqueous ink formulations can be more easily designed in view of limiting safety risks for operators as well as end users, and for printing on food packaging (although carefully designed UV inkjet inks can also be used). In addition, prints with aqueous inks can potentially be recycled (to be proven by case-by-case studies).

Aqueous inkjet ink compounds (source: Agfa)



Finally, aqueous inks use a carrier comprising water and organic co-solvents, which are low-cost compounds. Depending on the other ink compounds (pigment, dispersion agent, binder) and the ink amount needed, the aqueous ink can deliver attractive economic benefits.

HOW ARE AQUEOUS PIGMENTS DESIGNED?

Formulating aqueous pigment inks requires tailoring the ink properties to the jetting process with piezo printheads, as well as controlling the drying of the ink; both are key elements for mastering image quality.

The jetting process requires low viscosity (about 2–10 mPa.s at jetting temperature, i.e. between room temperature and 35°C). This greatly limits the selection of ink compounds.

The combination of all ink compounds in the correct ratio results in ink formulations that produce sharp, high-quality images, tailor-made for specific applications. We take the entire print system into account during the ink development, and spend a lot of care on the very detailed study of jetting performance and long-term jetting reliability. Furthermore, the full production process (including pre- and post-processes) is considered during the entire ink design.

Agfa technology produces aqueous inks with a wide colour gamut and a long shelf life

ADVANTAGES OF AGFA'S AQUEOUS INKJET INKS:

- Experienced in pigment dispersion, Agfa focuses on delivering outstanding colour strength.
- Designed for batch-to-batch consistency, the inks promise consistent print results with little variation in performance, because of their jetting reliability.
- The composition and pigment dispersion qualities yield inks with great longevity: up to 24 months.
- Agfa formulates and uses the most appropriate binders to optimise print performance, with or without use of primers.
- The inks can be used on porous substrates, and are also suited for coated papers and cardboards. In future, this will be extended to other types of substrates.

The addition of a binder can deliver an important contribution to the durability of the print, but its impact on jetting reliability needs to be limited. Many different binder chemistries can be used in water-based inkjet inks. At Agfa, we base our selection on the combination of adhesion to the substrate, durability of the print, and jetting performance. In some cases, no binder is needed.

DESIGN ASPECTS FOR GREAT INK

Pigment dispersion is the key element. Agfa has a very long history in dispersion technology of pigments. We have tuned our technology specifically to inkjet printing, where a very narrow particle size distribution of pigment particles is crucial for all ink performance aspects. The Agfa technology results in aqueous inks with a wide colour gamut, excellent jetting reliability and a long shelf life.

WHICH INDUSTRIES WILL BENEFIT?

One of the industries currently exploring inkjet printing solutions is the laminate flooring and furniture market. A second industry is the packaging industry, especially corrugated packaging. In both cases the nature of the substrate is most suited to be printed on with aqueous inks, but the ink formulation is a key element in the design of the complete inkjet printing system. The combination of water-based pigment inkjet ink sets with a primer needs to be considered, depending on the image quality target.

What are the main advantages for the laminate flooring and furniture market? Typically, décor laminates are printed using rotary gravure, with spot colours mixed prior to printing, to create a natural wood-effect design. The inks are printed onto décor paper and then laminated to a base layer, usually by impregnating a melamine resin under high temperature and pressure. Adopting digital printing

'Aqueous ink technology has improved strongly in recent years'

enables customers to introduce new designs more quickly, increase productivity, and reduce printing and storage costs – especially for short runs. They can print more colourful designs, and decrease product and cylinder stocks.

The packaging industry also stands to benefit. Traditionally, corrugated packaging is printed using analogue flexographic or offset printing technology. However, smaller runs, just-in-time printing and e-commerce are driving demand for digital printing directly onto corrugated packaging. The result is an ever-increasing number of print systems for corrugated boards on the market. Agfa's water-based corrugated ink technology takes the complete board production process into consideration: printing on liner or primed liner, covering printed images with overprint varnishes, and even folding the board to the right shape.

AQUEOUS INKS FOR EVERYDAY USERS

What difference do aqueous pigment inkjet inks make for everyday business users?

In today's fast-paced business environments, the demand for high-speed document printing, for example for direct mail, and promotional and transactional purposes is ever-increasing. Agfa's aqueous inks help meet these needs: variable data can be printed on demand, with changes in text, graphics, and images made from one printed piece to the next, without stopping or slowing the printing process. ■

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ADVANCING WITH AUTOMATION

David Zamith explores the importance of automation in digital CTS screen stencil making, and discusses how to position screen printing at the forefront of the 4th Industrial Revolution

Managing Director of Ruy de Lacerda, David Forrester Zamith

The screen lab concept at Ruy de Lacerda

From my e-work platform I wish all of you and your loved ones the best of health! The economy must go on and we have to be prepared for future recovery; perhaps working in different ways from those in which we operated before the COVID-19 pandemic.

Although the terms 'industry 4.0' and 'fourth industrial revolution' are often used interchangeably, 'industry 4.0' factories have machines which are augmented with wireless connectivity and sensors, connected to a system that can visualise the entire production line and make decisions on its own.

Today, at the heart of traditional screen printing (graphic/textile/functional), it's imperative to be using innovative CTS (computer to screen) technology, with all industrial process steps standardised and based on automation to guarantee reproducibility and repeatability – and not forgetting continued training for better results.

'With I4.0 opportunities will increase significantly because of the benefits the technologies offer'

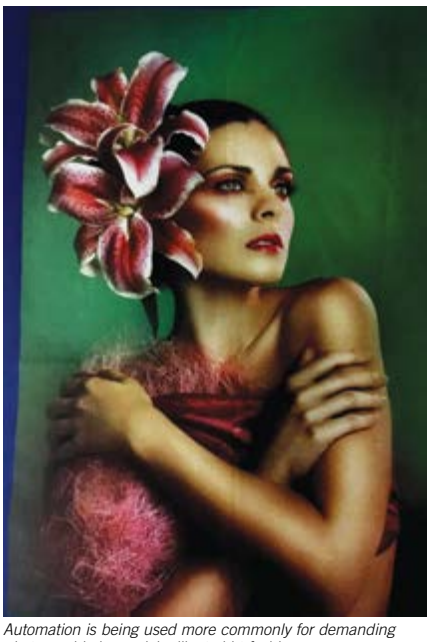
CTS-enabled 3D screen print mimics embroidery

SCREEN LAB CONCEPT

Globally, more and more companies using screen printing technology are adopting the so-called 'screen lab concept' for their prepress processes.

The prepress screen lab concept includes:

- A clear space with air conditioning and a clean environment.
- Avoidance of all kinds of contamination.
- Avoidance of excess humidity, so the water zone should be in a separate room.
- Use of only quality certified mesh types.
- Automated stretching and coating.
- Drying with good ventilation and lower temperatures.
- Using 'filmless' CTS for digital direct light UV exposing (a one step process).
- CTS models can be static, modular or fully automatic systems for stencil feeding, exposing, developing, pre-dryer and stencil discharge.
- Using dedicated RIP software for screen printing technology.
- Keeping a select number of pre-coated stencils in stock, for fast production exposing or troubleshooting.
- Having stencils flow from the 'lab' directly to the print room.
- Internal training or at suppliers (of mesh, chemicals, ink or equipment) with Technologic Centres to improve qualifications.



Automation is being used more commonly for demanding photographic image jobs like t-shirt fashion

CTS-assisted transfer print (1270dpi)

AUTOMATION

Clear benefits of the 4th Industrial Revolution (I4.0) include software highlighting functionality, improved efficiency and productivity, better flexibility, agility and increased profitability. Industry 4.0 also improves the customer experience anchored on better team qualifications.

Today, the traditional approach to strategy requires exact predictions and ROI analysis. With I4.0 opportunities will increase significantly because of the benefits the technologies offer, including those that improve automation, machine-to-machine communication

'If you use Screen Printing Technology, use the lab concept'

(inline automation), manufacturing control, higher productivity, faster sampling or production runs and decision making.

Excellent examples were shared at last year's GlassPrint Conference in Dusseldorf, featuring leading global technology providers for the business sectors of glass decoration, flat glass and

Continued over

The prepress screen lab concept includes automated stretching

Inline automation with CTS technology

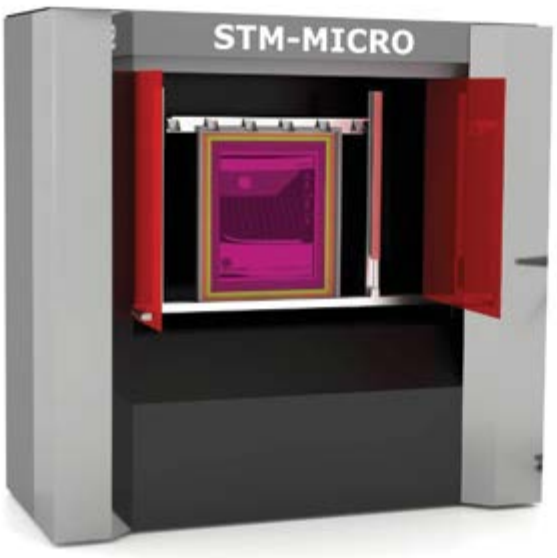
hollowware or automotive, using screen printing, digital or decals, in printing, curing and drying of inks and varnishes. With its highest ever participation levels, GlassPrint showcased the vitality of printing in decoration and in technical and functional applications on glass, in a two-day format of presentations, focusing on screen and digital technologies, digital pre-press CTS and the 'importance of automation' from stencil making to printing.

ALIVE AND KICKING

Although some people still say that screen printing is in decline, the facts speak for themselves and the increasing number of CTS technology producers (inkjet, waxjet, diode lasers, LED or UV) worldwide confirms what we experience every day. It is important to analyse correctly where screen, digital, offset, flexo or rotogravure are the elected printing technologies (or combined) for a certain job, as it's absolutely clear that screen printing is growing in industrial or functional applications. It should also be noted that a 'general shrinkage' of the print industry in Europe was due to the movement of industries to Asia – where there is now a growth in printing.

Automation is being used more commonly; for example, making it possible to prepare two sets of four-colour process stencils in one step; for demanding photographic image jobs like t-shirt fashion; or to ensure multiple screens have the same parameters for industrial or functional applications.

The intrinsic advantages of screen printing technology are enhanced by CTS: better brightness, more colour and density options; printing on a wider range of substrates, etc. Improved quality is easily attainable, as long as the investment is made wisely.



Film-free CTS direct exposing of stencils is offered by machines such as SignTronic's STM-MICRO

SHREWD INVESTMENT

It is important to consider investment in innovative technology and automation, assuming that we live in a new world, in a shrinking Europe and a super volatile global environment. To survive the new rules for international trade, it is essential to know 'what the market wants' in order to respond adequately to constant new demands.

In different print segments, from small or large graphic format, textiles, decals, transfers, labels and packaging to the growth of functional applications, it is important to consider the following in your vision strategy:

- Should you be closer to the market?
- Do you know what the market wants?
- Does your prepress include 'digital' CTS Technology and automation?
- Are you prepared for innovative technologies in automation?
- Is there diversity of activity at the company's core?
- Have you mastered various technologies 'in-house'?

If you use screen printing technology, employ the lab concept. Living in a volatile world full of threats and opportunities, the logic of Industry 4.0 and continuous training should be seen as the two most important elements of entrepreneurial business development. ■

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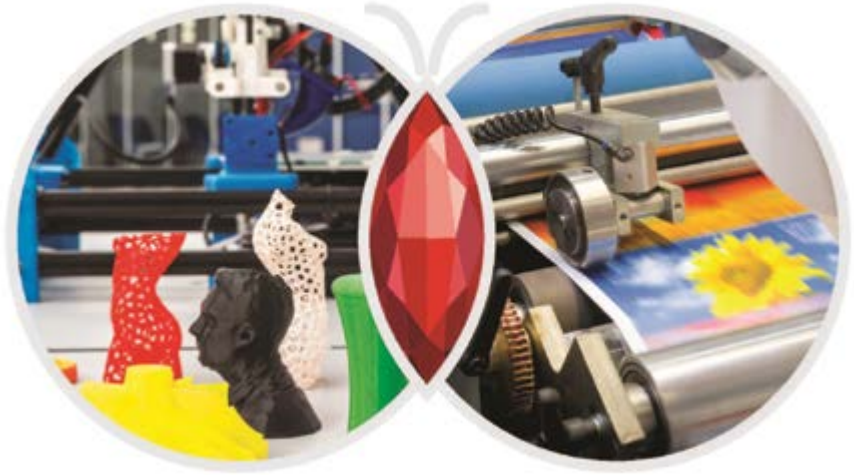
THINKING OUTSIDE THE BOX

Although governed by different techniques, 2D and 3D printing methods follow the same route, believes Itamar Yona, who advocates creating synergy between the two technologies to create business opportunities

Itamar Yona is Co-Founder & CEO of PrintSyst



In 3D printing you are printing batches of 2D layers in height

My name is Itamar Yona from PrintSyst, a young start-up company which is located in Israel. I'm an electrical engineer and the third generation in my family business of 2D printing, marketing and publishing in Israel.

In 1951, my grandfather opened the first printing house in Ness-Ziona which, for the uninitiated, is not the sexiest place in Israel but a little like Palo-Alto. My grandfather started with two-letter press machines and one wooden chair for his Turkish coffee breaks. Over the years his shop grew into a factory and my father joined the family business. The letter press machines were replaced by offset and digital ones. My father took over from my grandfather and I subsequently joined the family business after having graduated in engineering. Then, I discovered the 3D Printing, in other words – additive manufacturing.

This article is about sharing legacy insights and my own experience about how to create a natural synergy between 2D and 3D printing in order to create business opportunities.

PRINTING IS A TOOL

One of the insights that my dad passed on to me is the fact that printing is not the final mission of our family company. Printing is a tool in your toolbox which helps customers' businesses to grow. It's a means to an end. Once printing houses start using their machines, tools and knowledge in order to accomplish large undertakings and not just as a production line, their wheels will turn much faster leading to more profit.

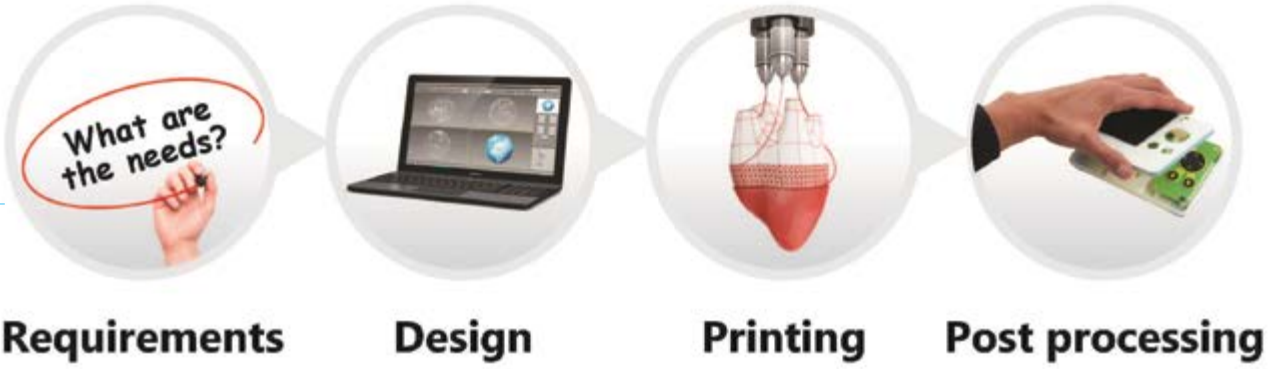
A lot has changed since then. My grandfather is no longer with us and technology has changed a lot. But one thing remains the same: the machines are still a means to an end. 2D printing providers have, for many years, been looking for ways to develop their businesses. The incoming younger generation has brought HiTech and engineering skills with them, resulting in the 3D evolution providing new services and products. Since we are now considered 'technical people', customers look to us to provide production solutions. This puts us at the forefront of technology in the field.

A COMMON ROUTE

Over the last three decades, we have seen that printing houses have adopted additional services such as wide format printing, web2print solutions, packaging solutions and, of course, short series printing according to customer needs. This evolution makes the printing houses more dedicated and more attuned to the customers' needs.

When I discovered 3D printing I realised that those wonderful technologies can complement my father's legacy and, of course, serve our customers' needs. If you analyse the route of the printing production line you will see a [similar] process flow: design; choosing materials and printing processes; printing and post-print processing.

Although 2D and 3D printing are governed by different techniques, the method follows the same route. The connection of the term 'print' in 2D and 3D printing can be found in this common route. Basically, you are printing using both of those techniques but in 3D printing you are printing batches of 2D layers in height.



Although 2D and 3D printing are governed by different techniques, the method follows the same route

Need + knowledge (2D printing + 3D printing) = great value

2D/3D SYNERGY

The fact that printing houses provide customised production solutions in their local areas makes 3D printing an added value to all our toolboxes. With 3D printing skills, you can provide solutions from prototypes, short series products and sometimes even mass production. You will find a demand for those solutions in packaging, paper bulb moulds, marketing products and more.

If you pay attention to the connection to 2D printing you will find compatible needs. There is an inherent connection between 2 and 3D printing. When a customer orders business cards he will probably need a 3D prototype. When he needs flyers and short series printing products, he will need the 3D printing in short series. Of course, it's the same when it comes to mass production of 2D and 3D printing.

There are also connections between 2D and 3D printing for the same products. For example, when you need to design a plastic package or bottle you [may] need to design a suitable 2D sticker, etc.

ADOPTING ADDITIVE MANUFACTURING SKILLS

How to adopt additive manufacturing skills. First, I suggest that you start on a small scale. By this I mean that you should start with a low budget 3D desktop printer. I built my 3D printer myself, but you don't have to be crazy like me; I would design my own watch if I could.

Start to develop your 3D printing skills. You will immediately find compatible and complementary needs to your existing products. Like the pill box that includes stickers, box and cap and like signage solutions – synergy of 2D and 3D printing.

I suggest that you put your efforts on a single selected process. There is a variety of additive manufacturing technologies and you should focus on developing your team knowledge on selected niches according to your customers' requirements.

2D printing and 3D printing are in sync. It is part of an evolution that is taking place now. You already have skills in your company DNA enabling you to make decisions. Time is all important if you want to benefit from this growing potential

Remember this formula: NEED + KNOWLEDGE (2DP+3DP) = GREAT VALUE.

Your customers are already looking for this and you want to be there for them with the answer. It is attainable. ■

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WALK THIS WAY

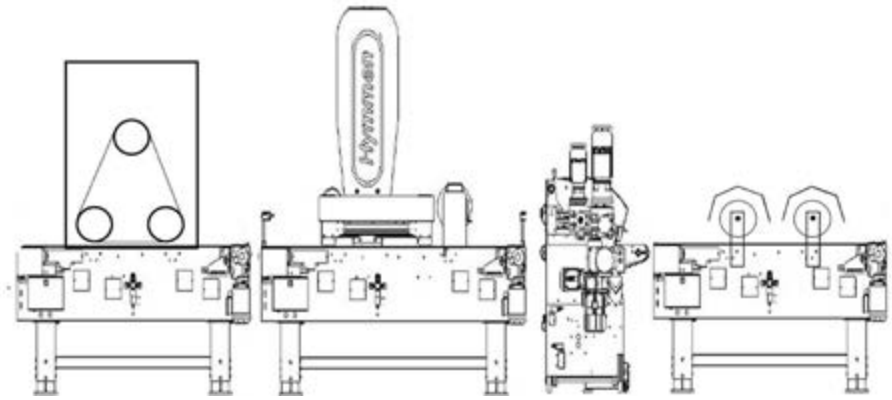
The digital structuring of surfaces is a very new technology. Dr. Anke Pankoke gives an insight into the development of digital staining and explores its potential to transform printed flooring

Digital Printing is already an established technology in the woodworking industry. Initially manufacturers focused on decorative print, then digital structure print entered the market.

Based on the knowledge of Digital Lacquer Embossing (DLE)-technology, a new innovative method has been created: a digitally-applied UV protective lacquer. This will lead to completely new product opportunities, in particular in the parquet industry, where it offers a substitute for traditional methods of wood staining. The following article gives a deeper insight into the latest developments of the German machine manufacturer and technology company, Hymmen.

BENEFITS OF DIGITAL PRINTING

Digital printing provides some basic essential benefits: it enables industrial production of small batch sizes, the embedding of digital print in process chains in the decor industry, individualised mass production, speedy reaction to market trends, short retooling times and low warehouse costs. Digital printing creates products which would be impossible with analogue technology. Extra-



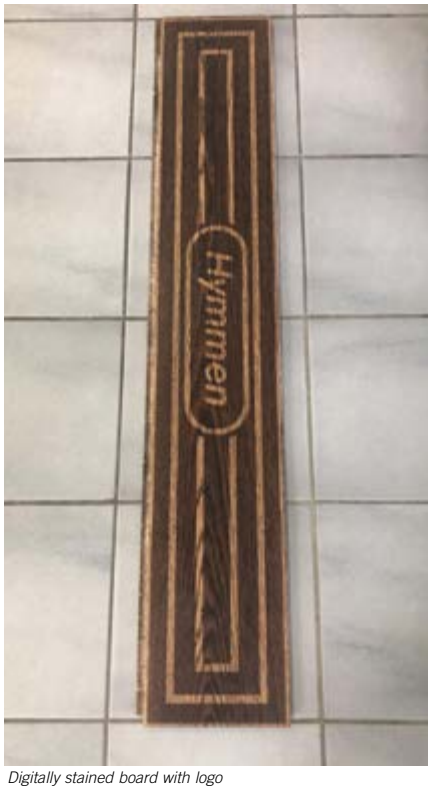
Staining method using digital printing

long pattern repeats, designs with 25 or more different boards, without repetition and designs with motifs which spread over multiple boards (logos, mosaic etc.) are just

'Hymmen has developed and patented the Digital Lacquer Embossing technique'

a few examples of decorative options. It is fair to say that printing decorative designs digitally with CMYK inks has become more or less established. The production of digitally printed flooring with Hymmen Jupiter printing lines alone is estimated at 70 million m²/year.

Digitally stained flooring with lines and logo



Digitally stained board with logo

A floor produced using digital staining was shown for the first time at Ligna 2019, the trade fair for woodworking and wood processing plant, machinery and tools, in Hannover

Adding characteristics, such as cracks, knots or colouring using a digital printing mask

DIGITAL STRUCTURE PRINTING

The digital structuring of surfaces is a very new technology. Hymmen developed and patented the Digital Lacquer Embossing (DLE) technique. One of the most important properties, alongside the appearance of the flooring, is its surface structure. However, the flexibility of digital printing is hampered by the inflexibility of the analogue structuring processes – decorative designs cannot be changed without losing time, and pattern repeats can be infinitely long etc. When it comes to the surface feel, the analogue structuring processes cannot keep up the pace. This is where Hymmen's DLE comes into play. It can be connected directly to a Jupiter digital printing line or even be used for digital structuring of surfaces printed and lacquered in other ways.

STAINING USING DIGITAL PRINTING

The basic idea of DLE has now been picked up on in order to create a further product which previously was only possible to produce with analogue techniques: furniture finishes and flooring which are decorated with a stain.

Formerly, staining was only ever possible over the entire product surface. The only way to include patterns and shapes in the design was by masking. Taking this method as inspiration, and using the DLE machine technology already developed, Hymmen has created a method and the patent is already pending.

In the first step, the wood is fine-ground in order to reduce standing fibres. Digital printing is then used to apply a highly transparent ink to the areas which are not to be stained. The ink is cured and the stain is then applied and distributed. A topcoat is finally applied to seal and protect the wood.

The applied ink layer is very thin (5–8 microns) and can be removed with a fine 'cleaning grind', meaning that a second passage with another stain colour or treatment with an open-pored seal is possible.

DESIGN OPTIONS

At the outset, every new technology is faced with the same challenge: how do you bring together this new technology with existing products? And this is where you have to think outside the box. It isn't always necessary to replace existing solutions with new technology. New technology can create something new or just something extra. ■

Dr. Anke Pankoke is Head of Marketing/PR at Hymmen

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DIRECT LINE

Folker Stachetzki looks at developments in direct-to-garment printing, and offers some pointers on selecting the right machine for your business

Since direct-to-garment machines were launched in the nineties, this technology has been constantly evolving. From the first CMYK-only versions to high speed production machines with five+ colours, DTG printing has become increasingly popular and is a now fixture in the industry.

Why is this? The first thing to point out is the high flexibility of DTG. Small print runs and even personalised single prints can be realised just as profitably as large quantities up to mass production. When DTG first started it was only for printing on white shirts – now, with printing a white under-base this is no longer relevant and garments of all colours can be printed on in high quality. In addition, there are hardly any restrictions *what* can be printed compared to other printing methods. The latest DTG printer in the field can print high resolution designs up to 1200dpi in CMYK mode – so how many colours a design has is irrelevant; from a single colour logo to high resolution photo, everything is achievable.

TECHNOLOGICAL ADVANCES

In recent years, there have been major advances in IOT, automation and Internet connectivity.

DTG printers no longer require the creation of print screens, as in the traditional screen print, so your digital designs can be sent direct to the printer, or via a RIP if you prefer. There are a lot of professional applications available for automated production – especially for online shops.

Integrating a DTG printer into an existing workflow or simply setting up your own workflow is also absolutely no problem; some manufacturers offer this solution for their machines and there are a lot of external companies doing customised solutions too.

Growing in popularity since the 90s, DtG printing is a now fixture in the industry

EXTRA EFFICIENT

DTG printers are also becoming more and more interesting for shop businesses, as they make it possible to print on site without taking up a lot of space, while customers only have to wait a few minutes for their finished garment.

Of course, the classic T-shirt is still the most widely used article but hoodies, jeans, caps, shoes and much more can be printed in DTG; and all of this can be produced on the same machine with the same ink. This gives the user the opportunity to increase product range by printing on other garments without any time-consuming conversion of the machine.

ENVIRONMENTALLY FRIENDLY

An increasingly important aspect is the environmental friendliness of products and especially their manufacturing process. Even there DTG can score, as garments are printed with water-based pigment inks and the DTG ink(s) are usually Oeko-Tex or GOTS [Global Organic Textile Standard] certified. Therefore the final product is not harmful to the customer and the production process does not cause any health issues either.

THINGS TO CONSIDER

No matter whether you want to get involved in the DTG business or if you want to increase the productivity of your existing system, you should think very carefully about your initial investment. Certainly, there are several aspects to consider before making your decision. One of the most important things to think about in the first place is what type of production you want to build, and the best machine you can work with to achieve your goals.

There are a variety of DTG models on the market, which can mainly be divided into single or multi-plate printers. While the multi-platen printers may have a higher output than most single-platen printers, they are also more expensive, require more space and are sometimes not as versatile as the 'smaller' models available in the market.

Additionally, some manufacturers of direct-to-garment printers offer an ROI (Return-To-Investment) calculator online, which can help you to select the best printer for your needs. ■

From a single colour logo to high resolution photo, everything is achievable with the latest DTG printers

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LASER FOCUS

Gérard Rich delves into computer-to-plate imaging technology and offers advice on choosing the right CTP system to meet all your needs

Printing is diverse in terms of the definition of printing forms and applications. It is therefore important for printers to look for the adequate preparation tools combined with the best choice of imaging technology. There are computer-to-plate (CTP), or computer-to-screen (CTS) devices that are hybrid in nature, optimised for any applications in terms of imaging resolution and imaging methods.

Different imaging systems are necessary to cover the needs of industrial, screen, pad, graphic and textile printing. In particular, high resolution imaging (up to 10,160 dpi) of silk screens with UV lasers and specialised software push the limits for demanding applications. Automation is called on to minimise human intervention in order to reduce both cost and process vulnerability. For instance in pad printing, where four different types of printing plates are used, there is a need for a technology offering many imaging wavelengths in combination with software tools and high resolution.

Lüscher's laser imaging technology offers four wavelengths for UV direct processing (375/405nm) or for thermal/ablation processes (830/940nm) and any resolution you can think of. Two different laser types can be incorporated in one system to address a broad set of needs.

INTRODUCTION

Prior to the advent of computer-to-plate, most printing forms were (and still are for the most part) UV sensitive and had to be imaged under UV light frames. As CTP was introduced in the 1990s, there were no affordable UV lasers that could process plates, and printing materials had to be adapted so that they could be processed with thermal or ablation lasers. Over time, the CTP landscape complexified itself as more types of printing forms went 'digital' and UV lasers finally became affordable.

'Over time, CTP systems have been improved to address demanding customer needs'

We will start by presenting a comprehensive analysis of the various imaging technologies relevant for the reader, how CTP systems address these needs and how recent improvements help pushing the limits. Finally, we will underline that there is always one optimal solution for any combination of needs.

SEGMENTATION OF IMAGING TECHNOLOGIES

First of all, we need to distinguish between thermal and UV lasers processes. Thermal processing lasers calling on IR (infrared) can only heat up potentially sublimate materials, whereas UV lasers can trigger chemical reactions, as is the case under a light frame. In offset printing, the thermal process (830nm) is primarily used, whereas ablation (940nm) is mainly applied to relief printing applications. The situation is more complex for pad printing for reasons we will explain in detail later on, and UV lasers hold a monopoly in the field of silk screen and photoresist applications.

Exhibit I gives an overview of imaging technologies used for six different printing forms relevant here. We distinguish between mainstream technology in the industry and availability of technology, i.e. having either a niche or an emerging status.

Historically, three wavelengths established themselves in the field. Thermal processes have a standard wavelength of 830nm. Ablation lasers were introduced at a later date and usually have a longer wavelength. We use 940nm as the laser power is higher at this wavelength. Initially, UV lasers were developed for the electronic industry with a wavelength of 405nm. Being only ten years

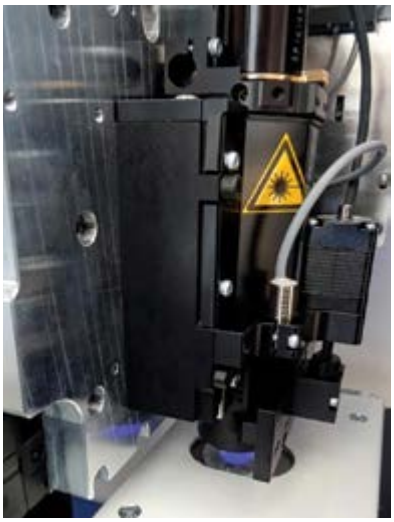
Continued over

BOX 1: BASICS ABOUT THE LÜSCHER LASER IMAGING SYSTEM

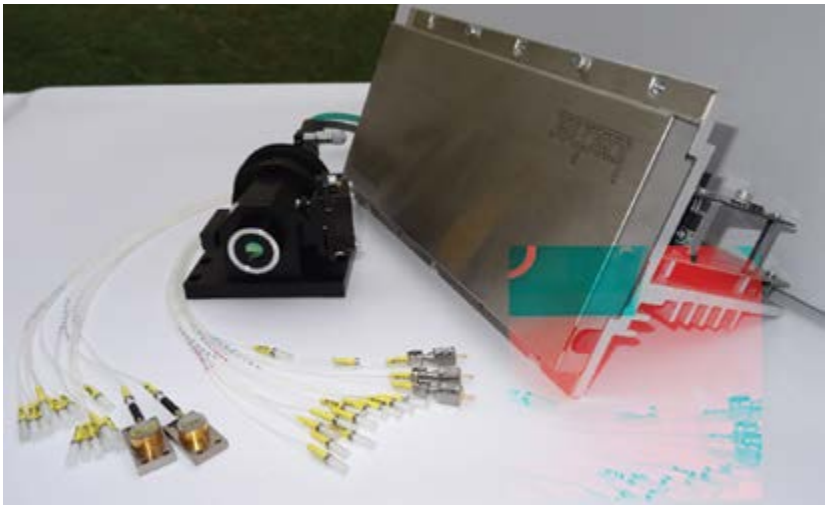
The Lüscher system is based on digitally controlled laser diodes. They scan the surface of a printing form in order to directly harden, destroy or ablate polymers. The individual laser diodes, coupled to optical fibres, bring the energy to the raster plate and the optics.

The energy is transferred via optical fibres and focused onto the surface of the printing form by the optics.

Fibre-coupled UV diode



Optics assembly with laser measurement box and focus system



Electronic module controlling lasers, laser fibre bundle and optics

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BOX 2: SOFTWARE IMPROVEMENTS FOR CTP IMAGING

Customers keep asking for improvements and systems benefit from continuous software development. Two examples are explained in detail in this section:

Variable resolution systems

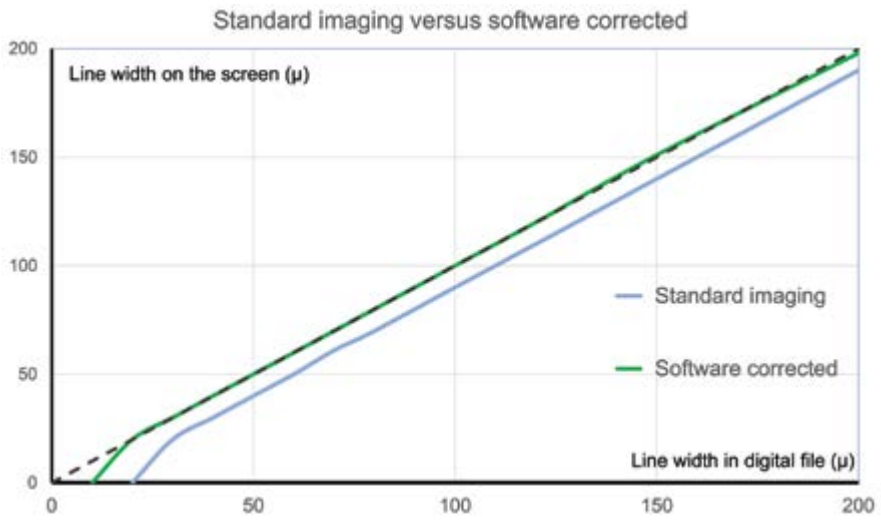
A key trend is the increase of imaging resolution to obtain a more accurate reproduction of digital data. For instance, systems imaging screens at a resolution up to 10,160 dpi have been recently introduced mainly for electronics. However, customers do not want to compromise on speed and ask for systems providing both high resolution for high end jobs and lower resolution to keep a high throughput for standard jobs. This is made possible by adequate software options.

Imaging of fine details

Imaging of very fine details is explained using the example of screen printing, but it also applies to photo resist applications and others. Customers have been pushing us to improve the imaging quality for fine printing elements to meet very stringent requirements. Therefore, we first had to understand what caused the deviations and then had to develop means to fix them.

To understand and to quantify deviations in imaging, we designed a special test file having line thicknesses from 10–200 microns in steps of 10 microns in relevant directions of space. Lines are used because their width can be properly measured under a microscope and results can be transposed to any other graphic element. The file was used to image screens with several high-performance emulsions from different suppliers on different mesh types. The outcome was evaluated quantitatively by microscope measurements of actual line widths generated on screens. This created a clear pattern that points in one direction.

The typical result on screen emulsions for fine graphics applications is illustrated in this graph. The job was imaged on a MultiDX! equipment at a resolution of 5080dpi. On the horizontal axis, the graph has the theoretical (negative) printing line widths in the TIFF file. The actual line widths with standard imaging (blue curve) and software corrected imaging (green curve) on the screens are illustrated on the vertical scale.



Graph showing standard vs software-improved imaging of capillary film

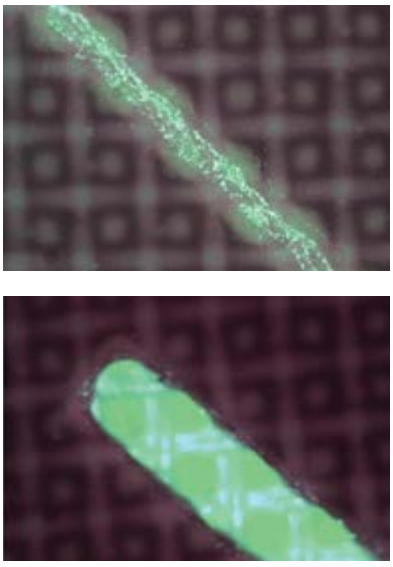
The results are analysed as follows:

There is a gap between the actual line width and the theoretical width (dotted line) in the standard imaging procedure that is significant. There is a lower limit of imaging at about 40 microns as thinner lines are not developed properly. The result on the same screen emulsion with software correction shows an almost perfect correction of the line widths.

The lower limit of imaging is pushed down to 30 microns. The improved software enables a faithful reproduction of digital data and also allows the reproduction of finer lines.

At the other end of the demand spectrum, the improved software pushed the limits for imaging thick capillary films.

With standard imaging procedures, even at high resolution, the light scattering and light diffusion in the film is limiting the imaging capability on the low end of graphic element sizes. Here again, software corrected imaging makes a huge difference.



Example of a 300-micron line of a 100-micron capillary film imaged at 2,540dpi. Top: standard imaging procedure (line not developed). Bottom: software-improved imaging (correct line of 300 microns)

old, 375nm wavelength lasers represent a fairly young technology. CTP builds on these new developments. Exhibit I underlines that the bulk of product types can be imaged with UV lasers. Because of the variety of imaging wavelengths, imaging of a set of printing forms may need more than one laser source. This has consequences for the CTP design.

LÜSCHER IMAGING SYSTEM

Right from the beginning of the CTP journey, Lüscher opted for a modular imaging system consisting of up to 128 diodes controlled by digital data at individual level. The laser energy is transported by optical fibres and collected onto a raster plate. The image created on the raster plate is reduced in size by the optics focusing the beams onto the print to be imaged. (See **Box 1** for more details.)

This architecture generates a set of valuable options. First, the diameter of the optical fibres and the characteristics of the optics with its variations allow the generation of any imaging resolution, almost at will.

Second, the system is compatible with any diode being either of the IR or UV type.

Third, two laser types can be combined in one system. Therefore, it is easy to mix any UV imaging process with any thermal or ablation process in one CTP. With four imaging processes and at least three laser types, the list of relevant combinations is considerable.

THE RIGHT CTP FOR YOUR NEEDS

Any printer must answer critical questions related to the choice of CTP. The first selection criterion is whether a flatbed system is mandatory. Drum systems can only accommodate flexible printing forms. The second criterion is whether UV and IR

Imaging process type and laser wavelength		Print form imaging - CTP type and resolution range (dpi)											
Type	Laser wavelength (nm)	Silk screen		Pad printing plates		Relief printing plates		Photoresist applications		Offset plates		Textile printing screens	
IR Ablation	830 up to 1064	-	-	External drum Internal drum Flatbed	2400 to 5080 dpi	External drum Internal drum Flatbed	2400 to 5080 dpi	-	-	External drum Internal drum Flatbed	2400 to 5080 dpi	-	-
IR Thermal	830	-	-	-	-	-	-	-	-	External drum Internal drum Flatbed	2400 to 12000 dpi	-	-
UV polymer degradation	405	-	-	-	-	-	-	Flatbed	2400 to 12000 dpi	External drum Internal drum Flatbed	2400 to 12000 dpi	-	-
UV polymer crosslinking reaction	405	Flatbed	635 to 12000 dpi	External drum Internal drum Flatbed	2400 to 5080 dpi	External drum Internal drum Flatbed	2400 to 5080 dpi	Flatbed	2400 to 12000 dpi	External drum Internal drum Flatbed	2400 to 12000 dpi	External drum Flatbed	1200 to 2540 dpi
UV polymer degradation	375	-	-	-	-	-	-	Flatbed	2400 to 12000 dpi	External drum Internal drum Flatbed	2400 to 12000 dpi	-	-
UV polymer crosslinking reaction	375	Flatbed	635 to 12000 dpi	External drum Internal drum Flatbed	2400 to 5080 dpi	External drum Internal drum Flatbed	2400 to 5080 dpi	Flatbed	2400 to 12000 dpi	External drum Internal drum Flatbed	2400 to 12000 dpi	External drum Flatbed	1200 to 2540 dpi

IR Lasers
UV Lasers

Mainstream process
Niche or emerging process

Exhibit I: mapping technologies and applications

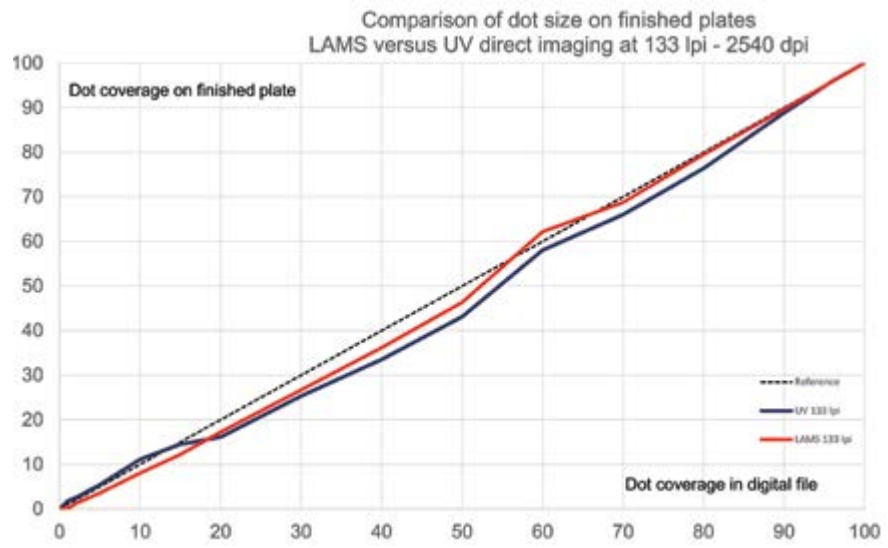


Exhibit II: comparison between LAMS and direct UV imaging for flexo water wash plate

BOX 3: JETSCREEN LT

The JetScreen system for large format digital imaging of screens offers imaging resolutions from 635 up to 5080dpi (depending on size); standard TriOptic system 635/1270/2540dpi; full in-line process automation if required; high power lasers to completely harden any emulsion; throughput up to 45m²/hour; low maintenance and operating costs.

Applications for: printed electronics, automotive, glass printing, transfer printing, labels and industrial screen printing.

Lüscher's JetScreen LT exposure system

are needed for the combination of needs considered. The third element is about the resolution range expected and the maximal size of forms (both are obviously correlated). Other options:

- If compatible with the need, a drum machine will always be faster than a flatbed system
- Exploration of the possibility to switch to another printing form technology to simplify the CTP design.

Over time, CTP systems have been improved to address demanding customer needs and this leads to important options, such as:

- Multiple resolution systems
- Software improvements of imaging of silk screens and photoresists

(To keep the text fluid, these options are presented in more detail in **Box 2**.)

IMAGING PROCESS LANDSCAPE

The processing options for silk screens, pads, photoresist and relief printing plates are presented next as they will influence the selection of the best CTP option.

Silk screen imaging

There are two main options that must be distinguished: for large format, vertical flatbed equipment is mandatory. (See **Box 3** for details on Lüscher Technologies' JetScreen LT exposure system.) For demanding applications with tight registration needs and high resolution, a horizontal flatbed system (such as MultiDX!) is preferable.

Figure 1 shows 20-micron lines on a steel mesh screen imaged at a high resolution and viewed under a SEM. Such a result is out of reach of an equipment operating with 'standard' resolution. (See **Box 2** for more details.)

Textile printing screens can be imaged with either flatbed or rotary UV CTP systems.

Pad printing forms

There is a choice of four imaging processes. These will be presented later on in sequence.

Lams ablation is a spin-off of relief printing. A carbon mask is ablated by IR lasers to

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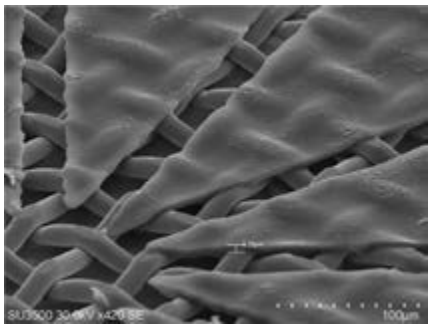

Figure1: 20-micron lines imaged at 10,160dpi

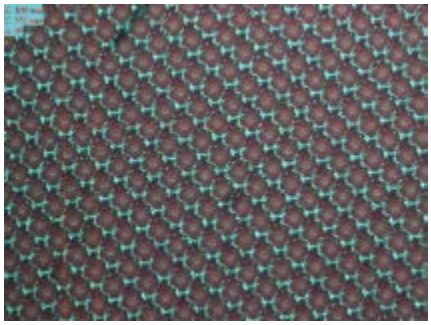

Figure 2: pad printing LAMS plate solid area

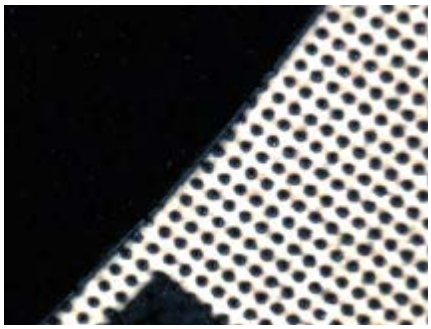

Figure 3: pad printing DLE plate

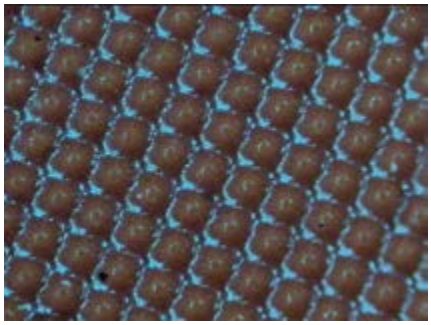

Figure 4: pad printing UV-exposed alcohol developed

create the equivalent of a film on the plate subsequently imaged under a light frame. **Figure 2** shows a microscope picture of a mask ablation pad printing plate – solid printing area.

Direct gravure (by ablation) is a recent development. IR lasers burn the pad printing cells into a special type of polymer. This comes close to a process-less system. **Figure 3** shows a microscope picture of a direct gravure pad printing plate – solid printing area. With the direct UV process, the polymer is selectively hardened by UV lasers. There are three options: **Figure 4** shows a pad printing plate processed by direct UV exposure and washed out with alcohol. See **Figure 5** for a 3D view of a different UV plate of the same type. High cell depth shown here. Figure 6 shows a polymer plate processed by direct UV exposure and water-washed – cell depth 100 microns.

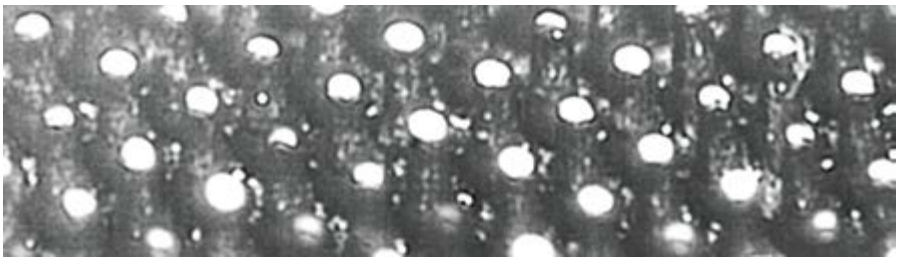

Figure 5: pad printing plate UV-exposed 3D view

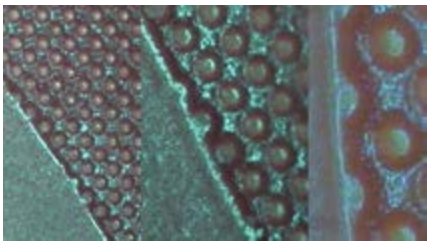

Figure 6: pad printing UV-exposed water wash plate

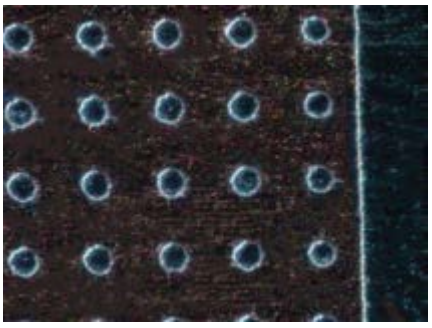

Figure 7: imaged protoresist plate

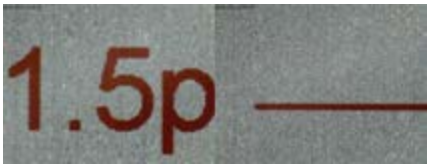

Figure 8: steel-based pad printing plate

Long-life pad printing plates made by etching of steel plates incorporate a photoresist layer that is imaged with UV lasers and developed. The plate is subsequently etched. See **Figure 7** for an imaged photoresist on a steel plate – 40-micron non-printing dots before etching.

Figure 8 is a view of the etched steel plate ready for printing.

Photoresist imaging

There is a range of applications including direct laser writing of conductive tracks, electroforming, wafers, etching, hot foil lamination, embossing, Intaglio, etc.

Figure 9 shows a laser imaged photoresist plate for hot stamping or embossing.

Figure 10 shows 20-micron lines on a laser imaged copper plate coated with photoresist.

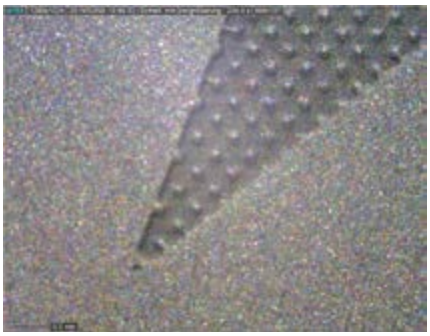

Figure 9: imaged photoresist on magnesium plate

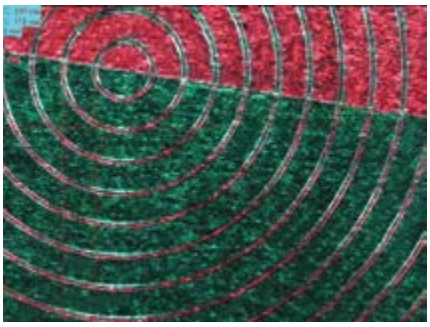

Figure 10: laser imaged photoresist coated on copper

Relief printing plates imaging

This covers flexo, letterpress and related applications. Relief plates can be imaged for the bulk using the LAMS ablation process. Except for SBR-based flexo plates, which are sensitive to oxygen inhibition, any relief printing plate can be exposed by the UV direct imaging process. See **Exhibit II** showing imaging results on both LAMS and UV plates presenting almost identical results.

CONCLUDING WORDS

There are two general trends that are transforming our industries. Customers have more and more demanding needs, and digital exposure of printing forms has become common use. This makes the choice of CTP (or CTS) more complex. With a set of criteria, however, it is possible to come to the optimal choice of CTP meeting all particular needs. ■

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SOFT SKILLS

Seeking improved printing stability, Dr. Daniel Hall discusses the results of an experiment to determine the benefits of density compensation software

Software density compensation for increasing uniformity is gaining acceptance as a solution to eliminate banding artefacts in inkjet digital printing. Compared with tuning physical parameters, software compensation can be more efficient and produce a more uniform result.

In a recent experiment we've discovered an additional significant benefit: using software density compensation can free up physical parameters to be optimised for stability i.e. stable jetting, fewer dropped nozzles, and lower printhead variability over time.

THE PROBLEM OF STABILITY

The fundamental challenge for inkjet is the physics of the micron-scale domain in which picolitre drops operate, which can be referred to as the mesoscopic physical domain. At this size, nanoscale molecular interactions, such as dynamic viscosity and surface tension, become increasingly important. However, the macro scale forces of bulk mass and thermal inertia are still strong. Therefore, picolitre scale drops are subject to a complex dynamic equilibrium between many strong forces with very different scaling parameters. So, for example, as drops get smaller the relative strength of surface tension increases greatly while the effects of mass inertia diminish, significantly altering the way in which drops evolve over time. Just as a mouse does not behave like an elephant, the behaviour of drops changes with size, e.g. modes of coalescence and transport change greatly with physical and chemical parameters. The effects of heat, chemistry, humidity, air flow, electric fields, particulates, bubbles are all felt strongly at the mesoscopic scale in which inkjet operates.

Bringing these physical parameters into perfect dynamic equilibrium to achieve consistent printing density on a printed page is not easy. Engineers working at large scales on machinery or on small scales like electronics may not fully appreciate the challenges of working with effects from both bulk and molecular scale forces at the same time. It is these inherent scale-dependent challenges that underly the engineering requirement for software density compensation for micron-scale digital printing systems.

Software density compensation like PrintFlat is a good solution to the density instability engineering challenge. In many ways this is analogous to the use of fly-by-wire in military jets: fly-by-wire allows the aerodynamics of an aircraft to be dynamically unstable to provide enhanced performance. Like jet aircraft, high performance inkjet will always push the engineering envelope of fluid dynamic instability.

TUNING FOR STABILITY

A nice thing about using software density compensation is that it frees up whatever physical parameters were used previously for density compensation. These parameters, e.g. driver voltages, can now be deployed to other tasks such as increasing printing stability or printhead lifetime.

'Just as a mouse does not behave like an elephant, the behaviour of drops changes with size'

One approach is to set driver voltages to manufacturer-recommended values. This ought to produce optimal performance; however, in reality printheads often vary in situ – either intrinsically or because of small differences in their immediate physical environment.

This suggests a new opportunity. Rather

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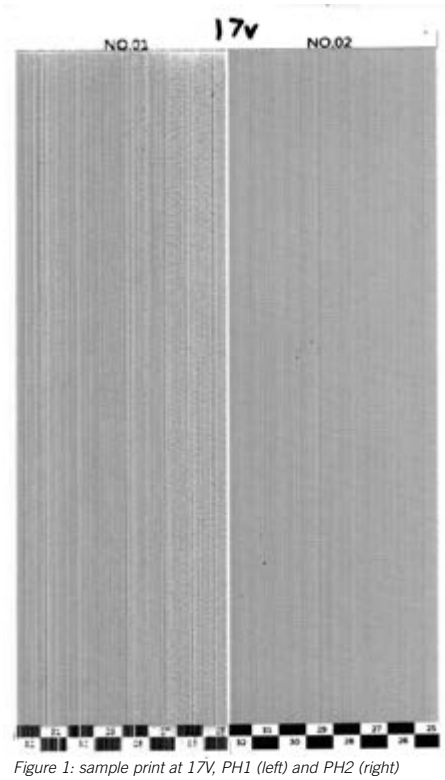

Figure 1: sample print at 17V, PH1 (left) and PH2 (right)

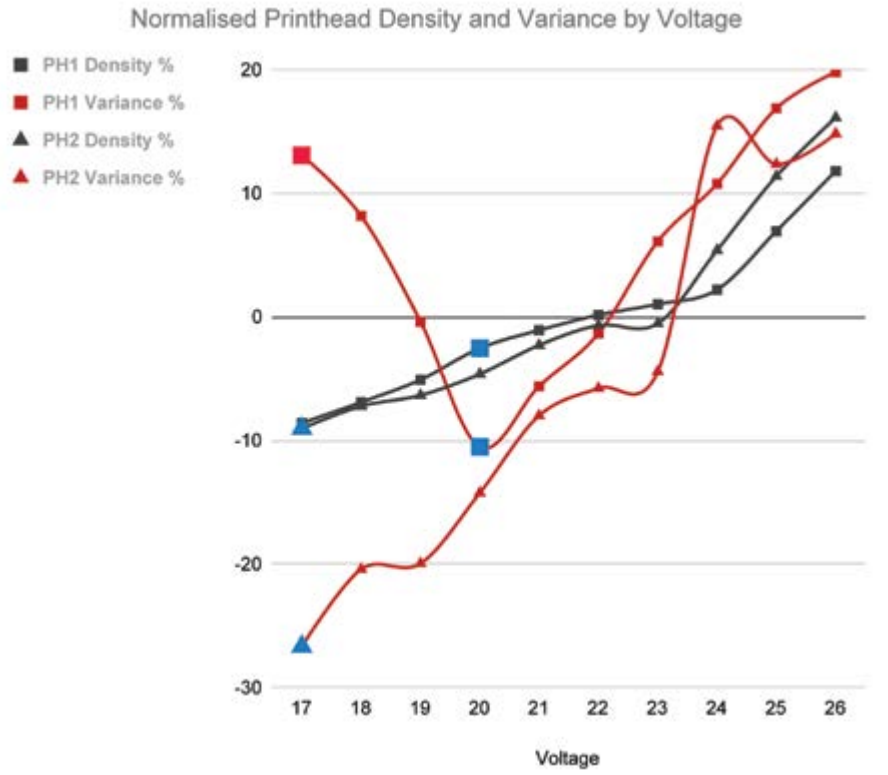

Figure 2: diagram showing the relationship between print density and variance for the two printheads over the experimental driver voltage range

Printhead 1	Drive Voltage	Relative Density	Relative Variance
	17.0	-8.6%	13.1%
	18.0	-6.9%	8.2%
	19.0	-5.1%	-0.4%
	20.0	-2.5%	-10.5%
	21.0	-1.1%	-5.6%
	22.0	0.2%	-1.3%
	23.0	1.0%	6.1%
	24.0	2.2%	10.8%
	25.0	6.9%	16.9%
	26.0	11.8%	19.8%
Printhead 2	Drive Voltage	Relative Density	Relative Variance
	17.0	-9.0%	-26.7%
	18.0	-7.2%	-20.4%
	19.0	-6.3%	-19.9%
	20.0	-4.6%	-14.2%
	21.0	-2.3%	-8.0%
	22.0	-0.7%	-5.8%
	23.0	-0.5%	-4.4%
	24.0	5.4%	15.4%
	25.0	11.4%	12.4%
	26.0	16.1%	14.8%

Figure 3: results table

than tune for density we wondered if it might be possible to detect and tune printheads for 'sweet spots' in their jetting stability?

To explore this possibility, we set up a test rig with two, notionally identical, printheads and measured the density variance from each printhead at different driver voltages. I'd like to thank Meteor Inkjet Ltd for making this experiment possible, especially Kevin Yu for managing the test rig.

Results (see **Figure 1**): The older printhead on the left shows more directional variance than the newer printhead on the right.

Figure 2 shows the following data collected from the experiment: The Relative Density is given as +/- percentage relative to the average density of both heads. The

'At this voltage PH2 is starting to climb dramatically'

Relative Variance is the +/- percentage relative to the average variance of both heads. Presenting the data in this format allows the data to be mapped meaningfully onto the same range. Each result shown was averaged from two separate print measurements. Printhead 1 and Printhead 2 printed simultaneously onto the same substrate for each print.

In the data we can clearly see that the newer Printhead 2 exhibits substantially lower minimum variance to -26.7% @17V (compared to the average of all measurements) while the older Printhead 1 has a 'sweet spot' minimum relative variance around 20V.

ANALYSIS

Figure 3 shows the relationship between print density and variance for the two printheads over the experimental driver voltage range. Points to note include:

- The generally lower variance of the newer Printhead 2
- The monotonically increasing density of both printheads with driver voltage
- The clear variance minima characteristic of the older printhead (PH1)

Various voltage driver policies could potentially be enacted:

1. Set the voltages to the same recommended default values, i.e. 22V. In this example this policy would work quite well as far as density is concerned with the new printhead (PH2) coming out just a few % lower density than the older one (PH1). However, this voltage is clearly sub-optimal from a variance point of view for both printheads.

2. Set the new printhead to mimic the density of the older printhead. This policy would be typical if a new printhead is installed in an existing digital press. In this case if PH1 was already at 22.0V, PH2 would intersect this density value at about 23.2V. However, at this voltage PH2 is starting to climb dramatically in intra-head density variance, indicating that printhead stability would be significantly worse.

3. Set each printhead to its intra-printhead variance minimising value (blue square and blue triangle on red curves). These voltages have the prospect of much lower intra-head variance and therefore likely printhead stability. These voltages (PH1 20.0V, PH2 17.0V) would generate significantly different densities from the two printheads (-8% and -3% compared to average density, an approximately 5% difference in absolute density). This is still well within the range where software compensation, e.g. PrintFlat, can eliminate banding. And as the underlying intra-printhead variances are much lower the net quality and stability is likely to be significantly improved.

CONCLUSION

Clearly the experiment demonstrates that the opportunity exists for these printheads to reduce the baseline intra-head variance by setting variance-minimising voltages. In this experiment for both PH1 and PH2 this reduction in variance would be significant (10-20% of total variance). However, setting these voltages would yield an average density difference between the printheads of about 5% which without software mitigation would result in printhead density bands in the output.

The general significance of these results still needs to be replicated and the wider scope determined.

Even in this quick investigation clearly the opportunity exists to improve printing stability by tuning physical parameters for stability, while using software compensation to deal with the resulting increase in baseline printhead to printhead density variation.

The length of our initial project did not allow for follow up investigations. However, anecdotally we believe that lower intra-head variance will also be correlated with printhead stability over time. It is known that there is often a correspondence between driver voltage and missing and deflected nozzles. This needs more careful investigation but promises to usefully address one of the most challenging issues in digital printing quality and stability.

Paradoxically, by loosening control of printhead average density, we may achieve greater printer stability over time.

We would welcome collaborations to explore these issues and to develop the potential of this technique for improving press stability. ■

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THE RIGHT STUFF

Typically, a customer buys a digital printer and ink to use with multiple products. Gregory Harwood advises on substrate requirements and selecting specialised UV inks for greatest versatility and performance

Why specialised inks? It's a frequently asked question: 'Why do certain substrates need specialised UV ink?' The performance of digital printing inks can vary depending on a substrate's surface tension. In some cases, the substrate may have a certain surface tension, while the ink carries another. If the two surface tensions don't align, the result is poor adhesion – or the ink will actually repel off the surface.

Given this, the surface tension of the ink being applied must be less than the surface tension of the object. If not, the ink will bead up against the substrate, creating a kind of water effect, with no adhesive bond taking place with the product. It may also just not stick at all. UV-cured inks, for example, can somewhat 'pin' the graphic to the substrate, but then it may readily flake off. To maximise the service life of the printed product, inks must anchor, or bond, into the substrate in order for them to stick.

'The goal is to minimise the need for frequent ink changeover'

Understanding surface tension or drying levels, therefore, is critical to picking the correct specialised ink and getting the results needed. It is essential that ink formulators understand the principles and relationships of surface tension for inks and the target substrates.

Bi-directional printing of plastic boxes utilising a specialised ink

DIGITAL PRINTING INK VARIETIES TO CONSIDER

While there are different types of digital printing inks, for purposes of this article, we'll focus on the popular and versatile category of UV inks. Within UV, there are different characteristics of inks, such as 'Tritan ink', which is specifically for Tritan products (a BPA-free durable plastic). This specialised ink can also work for other items, but it's specifically formulated for that material and its unique and popular substrate. There are also other inks designed for the sport bottle market. The impressions produced by these inks are squeezable and offer crease resistance; i.e. the objects can be bent and won't crack. That same type of ink, however, might be too flexible to work well with more rigid substrates.

When making selections, it's critical to find the proper balance based on understanding a customer's product line and determining their production volumes. If 80% of the printing is on Tritan, then it makes sense to make 'Tritan ink' the main ink – and then find ways to utilise it for other products. The goal is to minimise the need for frequent ink changeover.

Sometimes that comes as a result of an honest discussion and having the expertise to say, "We looked at your products and here are your top 10. This ink can handle eight of them. Does that justify the machine?" In most cases, it does, which allows users to consider a second machine for other items at another time – perhaps even using a different ink series.

To obtain optimal adhesion, glass needs to be flame-treated. In this case, the glass comes into contact with the hottest part of the flame to adjust surface tension

UV INK FOR SPECIFIC SUBSTRATES

When choosing an ink, it needs to be versatile. Typically, a customer buys a printer to use with multiple products, so a multi-purpose type of ink is essential. However, different substrates may still require different pre-treatments in order to run with a single

Continued over

Tritan plastic bottle printed with a specialised Tritan ink

ink. This is because printers aren't usually designed to pour in different inks on a rotating basis whenever the substrate changes. So, having one type of ink and then incorporating different pre-treatment methods to ensure proper ink bonding is the preferred process.

Companies that print on Tritan might have to follow this pre-treatment-then-print process, making it 80% of their workflow. As it happens, some industry suppliers have developed a 'Tritan ink', such as Inkcups' T2 series, that can print on Tritan without any pre-treatment. In that case, users only have to make adjustments for the other 20% of their business, which could include glass, metal and other materials.

'Different substrates may still require different pre-treatments in order to run with a single ink'

INK PRE-TREATMENTS

Ink pre-treatments comprise several processes that can be used to ensure proper adhesion. One method of pre-treatment is a flame process, where the plasma of a flame is used to change the surface tension. Another technique is to use a wipe-on chemical primer, where an operator wipes it on the object with a lint-free cloth before printing. For some applications it can be a combination of the two.

Additional pre-treatments include:

- Corona: an electrical-type of charge to the surface
- Plasma: effectively the same as corona, but more powerful
- Sprayable primer: for glassware; works in combination with a flame – first the product is heated and then sprayed with a primer

There are a number of ways to pre-treat a substrate, but the rule is to have as few touches as possible in order to reduce the amount of labour involved.

As for post-treatment, it's typically not needed. With proper ink selection and pre-treatment if applicable, excellent results are generally attainable as part of the print workflow. That way, finished products coming off the machine may be immediately packed and shipped, optimising productivity and efficiency.

ENSURING A STRONG BOND

Depending on the type of ink selected and the physical properties of the substrate, inks adhere in a few different ways. Some bond through absorption – typically with porous materials, such as wood or paper. Others adhere chemically by solvating or dissolving the surface and chemically uniting with the object. Finally, an ink can adhere by mechanically interlocking with the surface of the substrate, which is greatly dependent on how the coating wets the surface.

Regardless of how ink forms its bond, its adhesion strength must be sufficient for the application or the impression will not remain fixed. Typical adhesion failures include peeling, flaking and blistering.

To ensure that the ink-substrate bond is strong and long-lasting, the American Society for Testing and Materials (ASTM) has devised several standardised adhesion tests that can be performed. These include the scratch test, the tape test, and two crosshair tests. Additional tests can also be done, depending on the item, process, and customer requirements.

THE RIGHT INK FOR YOUR PRODUCT

When a buyer considers a printing system, it's typically based on the need to print on three or four popular substrates. Most ink suppliers will do an initial ink validation and recommend a formulation for the customer's applications. Leading suppliers go one step further and in effect serve as consultants, offering the customer a range of options to consider based on more in-depth evaluations and testing.

Such an evaluation process should include a variety of sample primers, in order to build a knowledge base of their effects on different substrates. Additional steps that could be taken include providing a primer wipe and testing all available primers. If one of these proves suitable, the customer can procure it in bulk quantities.

In certain cases, if a customer is unsure, does not have the time, or simply prefers not to undertake testing themselves, they can send the product to be tested by the ink supplier. Lastly, a detailed report is provided on what was effective and what was not.

These considerations taken up front, in collaboration with a knowledgeable and experienced ink supplier, will help ensure that ink and product are well matched for a long-term bond. ■

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Continuous strong growth in all market segments over the past few years made it necessary for Koenig & Bauer Kammann to relocate to a new building with more space and customised facilities

ROOM TO GROW

Axel Bohlmeier delves into the development of an innovative new machine targeting the beer and soft drink market, and looks at the growing demand for digital printing on glass

In *Specialist Printing Worldwide* Issue 3 2019 (pp.30–31), it was reported that Koenig & Bauer Kammann's production facilities were 'the subject of major investment and expansion'. The company has now moved to a new building with more space and customised facilities.

The relocation was completed on 20 December 2019 and all business units are now operating out of the new building, just three kilometres from the previous location.

The new factory combines 6,000m² for production and 3,000m² of office space, and is built on a 27,000m² plot with sufficient space for future extension. The building features state of the art infrastructure and offers 65% more storage space for parts and components, as well as an automated high rack warehouse with computerised immediate 'on demand delivery' and short distances from warehouse to assembly line. There is assembly space to build 12 machines simultaneously and ten new work stations for engineering and administration. The new premises were designed to meet Koenig & Bauer Kammann's exact needs for building fully automatic screen and digital printing machines for the glass industry.

'Kammann's HS 300 allows glass manufacturers to reduce the thickness of the base and reduce bottle weight'

The company also invested in a new demo and development centre with several permanently installed machines. In addition to presenting various models and machine features in the showroom, the facility allows Kammann to test new screen and digital inks,

Continued over

The HS 300 is Kammann's new high-speed printing machine for the decoration of round beer bottles and glass bottles for soft drinks

Digital printing on glass contributed to the company's growth

print samples, and to further develop digital printing with its team of process engineers

INTRODUCING THE HS 300

Coinciding with the inauguration of the new building is the presentation of Kammann's latest development: a completely new machine type, targeting the beer and soft

'A unique feature of digital printing is the option to imitate embossed glass by printing multiple passes of clear digital ink'

drink market. The HS 300 line of equipment offers speeds up to 300ppm and up to eight printing stations for thermoplastic inks, which the company says is over 50% more output than any other machine on the market.

Besides high speed and productivity, the HS300 offers some features, which are completely new, such as:

- Contactless camera pre-orientation to the bottle seam. This allows glass manufacturers to reduce the thickness of the base and reduce bottle weight.
- Freely selectable use of each printing station: each printing station can be used to print either on the body or on the neck. Any combination is possible.
- Print Image inspection system to identify any misprint or colour variation.

Kammann's first HS 300 delivery is scheduled for May 2020. A double speed machine for 600ppm is scheduled to be ready by the end of 2021.

DIGITAL PRINTING

In the last 24 months, digital printing on glass has also contributed to the growth of Kammann. Growing demand for machines with the ability to print high resolution images (up to 720dpi) using the half tone process

Kammann moved to its new premises in December 2019

has resulted in more than 20 models sold. This machine type has become the industry standard for printing high quality beverage bottles (spirits), drinkware and cosmetic containers with the digital process. High resolution print images, small order sizes and individualisation is now possible with this new technology.

Another interesting unique feature of digital printing is the option to imitate embossed glass by printing multiple passes of clear digital ink, thus achieving any thickness desired. For small runs or exclusive designs, this process eliminates the need to build special moulds.

NEW POSSIBILITIES

While 50% of Kammann's sales worldwide are still obtained from its versatile K15 screen printing machine for printing on all kinds of glassware, digital printing is also offering new possibilities in combination with other processes, such as foil transfer. The K-2019 in Düsseldorf show introduced the option of using a digital primer in combination with a foil transfer unit, allowing foiled images to be changed without changing screens.

Another recently developed feature is LED Pinning, which allows 360-degree printing to wrap around the article – and is only possible if the beginning of the print image is touch dry (overprintable). Whatever your decorating task, Kammann can offer a solution! ■

Axel Bohlmeier is Area Sales Manager for Koenig & Bauer Kammann

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Screen printing offers options from printing on simple round bottles with thermoplastic inks to 9-colour printing on difficult shapes with UV or LED curing inks

A result achieved with dual process: hot stamping + screen printing

THE BIG SQUEEZY

Shrewd thinking and a quality product enabled this French firm to consolidate its position in the screen printing market. Corentin Chretien has the full story

Manuel Zuckerman, General Manager of Fimor

In four decades, family-owned company Fimor has developed a strong name in the screen printing industry with its Serilor brand and a presence in over 80 countries through a network of over 300 distributors covering all screen printing applications: industry, electronic, glass, textile, label, commercial graphics.

The company has its headquarters and production facilities located in Le Mans, France, and is ISO 9001 and ISO 14001 certified. Over 90% of Fimor's production is exported from France, notably to Asia where the majority of industrial printing is located nowadays, or to the USA, where direct textile printing remains very strong.

'Quality-conscious customers have invested in more expensive triple layer squeegees'

SHARP THINKING

Fimor has developed products suitable for most screen-printing applications, ensuring the stability of the printing process. Its squeegees are produced by centrifugation to guarantee homogeneous thicknesses and bubble-free surfaces. The company provides complete traceability from the raw materials to the finished products.

Cut squeegees represent the bulk of Fimor's offering as they are the most competitive, widely available and offer a great cost:performance ratio. A printer will still need to define a hardness (typically ranging from 55–80 shore hardness) corresponding to their needs. A softer squeegee (55–65sh) will lead to more ink being printed, when high coverage or thickness is required at the expense of details, while a more rigid squeegee (80–85sh) will offer less ink lay down but better definition. A shore hardness of 70–75 is a popular choice for a compromise. Quality-conscious customers have invested in more expensive triple layer squeegees that offer a mix between good ink coverage with softer external sides and a rigid internal layer to prevent excessive flex. This is particularly beneficial to faster machines, long print dimensions, or long runs.

An advantage of cut squeegees is their ability to be re sharpened. A typical re-sharpening process will refresh the edge, thus maintaining constant quality in print – and get a better output of a squeegee. Let's not neglect the levelling function of sharpening a squeegee in its holder even before the first print.

VERSATILITY

"The beauty of our market is that this essential tool makes us present in virtually all markets covered by screen printing, from

The factory is located in the heart of the city of Le Mans

textile to industrial printing, from ceramics to electronics, from graphic displays to label printing...” noted Manuel Zuckerman, General Manager and second generation owner. “We are providing solutions to companies printing pens, discs, shirts, high tech electronic displays, solar cells or security devices. We even had a customer asking for a squeegee to print crepes! Our clients range from the occasional mom & pop garage textile printer to public-listed high tech companies that operate in white room conditions... yet they are all part of the screen printing community and it has been great to serve this variety of customers and challenges over the years.

“Today we must face a market that is very mature on one side, and very innovative on the other side” added Zuckerman. “We must provide high tech, customer specific solutions while a segment of our customers in developing economies is tempted by low cost

“We had a customer asking for a squeegee to print crepes!”

products that don’t always offer the same guarantees or the same chemical manufacturing conditions. But this challenge is common to many of our international partners at ESMA (European Specialist Manufacturers’ Association) of which FIMOR is an active member and that promotes the use of screen among other techniques for printing. We are confident that our product and service level will continue to be recognised and follow the evolution of printers worldwide.” ■

Serilor squeegees for all screen printing applications

Serilor is a registered trademark of Fimor SAS

Corentin Chretien is Key Account Representative at Fimor

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STAMP OF APPROVAL

When a family-run rubber stamp company explored screen printing for garments, they discovered that the technology also offered a cost-effective alternative to vinyl cutting. Mark Vasilantone relates how this happened

Rubber stamps have been the mainstay of Advance Stamp & Sign Co. since Bernie Sitron opened his doors three generations and 60-plus years ago. The family business has since expanded to include engraved signs and notary seals, large format printing, vehicle lettering, architectural signs and – most recently – screen printing for garments and Coroplast signs.

"To this day, we still make rubber stamps all day long," says general manager and Bernie's grandson, Elliot Sitron, who joined the company in 2005.

Once on board, he began investing in automation to reduce labour and improve efficiency. Upgrades included a laser cutter and engraver for making rubber stamps and a rotary engraver/router for producing Braille signage. With the advent of high-tech equipment, the shop was able to fill larger orders while keeping all services in-house – with the exception of printed garments.

"Every now and then someone would request a printed T-shirt or hoodie," says Sitron. "We hate to say 'no' to a customer, so we'd outsource the work. But we lacked control over quality and turnaround time."

MAKING CHANGES

Sitron began researching screen printing for garments and discovered that the process could also make a cost-effective alternative to vinyl cutting, the shop's standard method for producing Coroplast signs. In 2018, he purchased the necessary pre-press and printing equipment from Vastex International. Thereafter, he and one of his employees attended a three-day Vastex training course to learn the screen printing process.

Advance Stamp & Sign owners Steve (L) and Elliot Sitron

With the four-colour/four-station V2000 HD manual press, Advance Stamp & Sign began printing shirts and hoodies for local businesses and schools as well as signage.

'With the four-colour/four-station V2000 HD manual press, Advance Stamp & Sign began printing shirts and hoodies as well as signage'

The press's micro-registration system allows fine-tuning of print alignment to maintain registration throughout the run. Adjustments are made with hand knobs instead of tools, which was a selling point for Sitron.

For garments, he uses a RedFlash flash cure unit with a 46 x 61cm heater and an Autoflash upgrade to flash plastisol ink between colours. The head of the unit rotates into place via a foot pedal and automatically rotates away from the pallet after a preset dwell time.

"It made sense to have an automatic flash cure unit," says Sitron. "It takes a variable out of the process that could potentially be a problem: if we forget to move the flash unit, it could scorch the shirt."

Continued over

VRS pin registration system allows screens to be registered off-press, and then clamped on press with all colours in register

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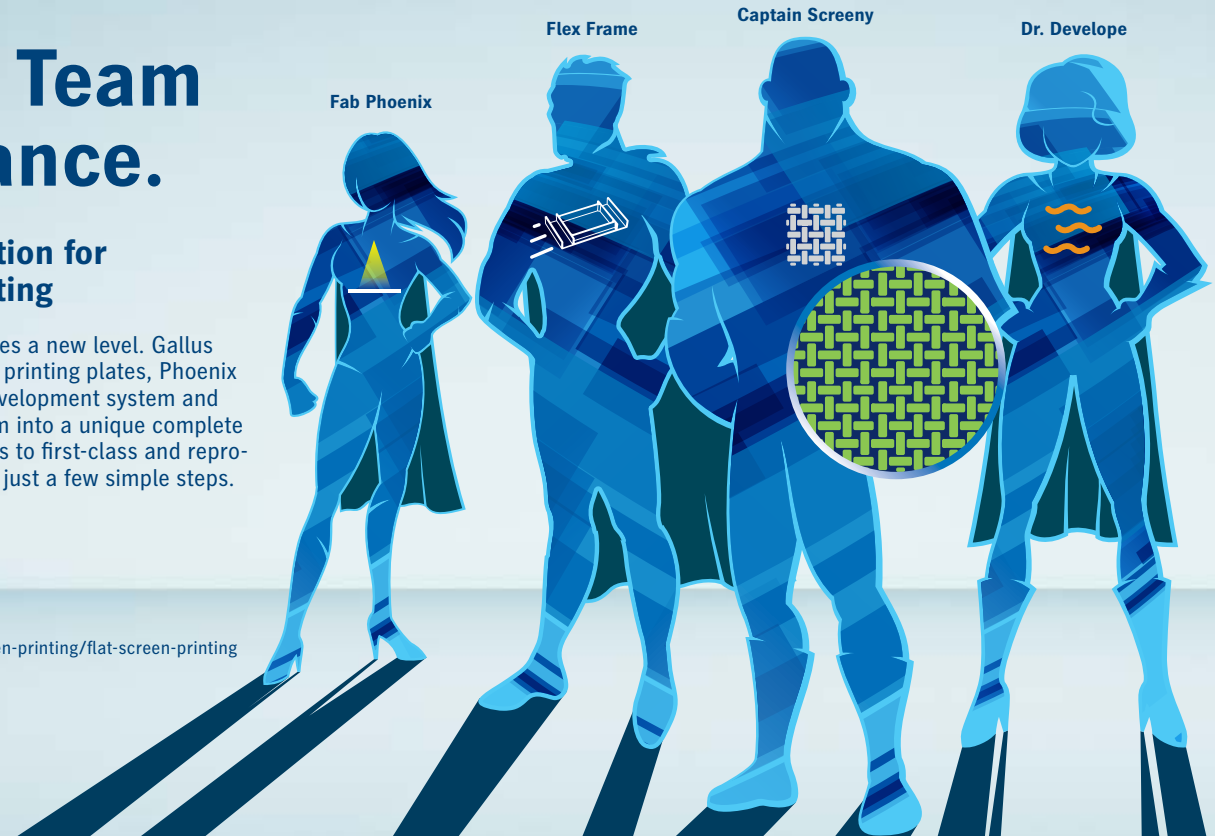

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C100 screen coater rack frees the operator's hands to coat the screen quickly, easily and uniformly

LED exposure unit exposes screens in approximately one minute, producing high-resolution line art and halftones

Advance Stamp & Sign upgraded its 4-colour/4-station manual press to 8-colours/8-stations in a few hours

SCREEN PRINTING SIGNS

Coroplast substrates can be challenging to work with, explains Sitron: the signs are made of non-porous, corrugated plastic, which does not absorb ink like the shirts do and can lead to colours bleeding.

He invested in a 51 x 66cm vacuum pallet to accommodate 30 x 46cm and 46 x 61cm signs. The pallet mounts on a pallet arm that slides onto the rotor arm of the press, making it easy to switch pallets as needed. The vacuum pallet's levelling feature ensures an even transfer of ink while an integral vacuum pump and hundreds of perforations across a suction grid hold the substrate securely in place.

"The registration system has been a major timesaver"

Unlike plastisol ink, which cures with heat, Coroplast substrates require a thinner, solvent-based ink that air dries. With the manual press and vacuum pallet, operators can print a detailed sign in two to three colours – something Sitron could not achieve with vinyl lettering due to the time and expense involved.

"We just finished screen printing 100 signs for a high school," he says. "Previously, we could only print 12 to 24 signs because making more was not cost-effective. We would have to unload and load different rolls of vinyl, which was time-consuming and far more expensive than a container of ink."

The finished signs air dry on a drying rack while printed garments dry in a LittleRed X1 infrared conveyor dryer with a 76cm wide conveyor belt. Having a 2,600-watt heater, the dryer can cure up to 130 plastisol-printed images per hour.

"The heater unit can be raised or lowered, depending on whether we're running a sweatshirt with a hood or a thin, polyester shirt," he says. "The temperature and belt speed are also adjustable, which allows you to set a higher temperature for cotton and a lower temperature for polyester to prevent the dye from migrating into the printed area."

PREPRESS EQUIPMENT FOR SIGNS OR SHIRTS

Sitron invested in a C100 screen coater after seeing other printers struggle to coat screens without the aid of a mounted rack. The height of the rack is adjustable and can accommodate screens for garments as well as 58 x 79cm screens for Coroplast signs. He says that the rack gives him greater control over the coating process and reduces the mess.

"Everything I read said that if you don't have a quality screen you won't have a quality print," so he researched exposure units and decided on an E200-2331 unit having a 58 x 79cm maximum screen outside diameter to accommodate standard as well as Coroplast

Advance Stamp & Sign prints shirts and hoodies for local businesses and schools, and clamps a 51 x 66cm vacuum pallet onto the press's pallet arm to print signs up to 46 x 61cm

A foot pedal rotates the flash cure unit into place above the newly printed colour, and then automatically rotates away, preventing over- or under-flashing

screens. Exposure time is approximately one minute. He appreciates that the LED unit is energy-efficient, and that bulb changes are "almost non-existent."

Sitron also invested in a VRS pin registration system to locate positives onto the screen off-press. Using the alignment pin board, the positives are attached to setup

The 76cm wide infrared conveyor dryer can cure up to 130 plastisol-printed images per hour

Micro-registration knobs, foreground, allow precise screen adjustments

sheets in register and then attached to the screens. Screens are then clamped onto the press in register using a pallet jig.

"The registration system has been a major timesaver because we can't dedicate our entire day to screen printing; we also need to make engraved signs and stamps," he explains, adding, "We can set up a four-colour job, expose it, and rinse and dry the screens within 10 minutes."

Sitron recently upgraded the company's press to eight colours/eight stations to fulfil an order for the March of Dimes. He says the retrofit required only a few hours.

A CHANGE OF PACE

While Sitron is involved in day-to-day operations, his father, Steve, who owns the company, visits existing and prospective clients to promote the screen printing side of the business.

"Screen printing is still a fraction of what we do," Elliot Sitron says, "but in time it will grow. When it does, the next machine we will need to upgrade is our dryer."

Meanwhile, he enjoys his newfound skill: "Screen printing is hands-on and offers instant gratification. It's a nice change of pace from setting up a big job on a machine and just letting it run." ■

Mark Vasilantone is President of Vastex

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The Impressions Expo Long Beach trade show and conference took place during 17–19 January 2020

IMPRESSIONS EXPO LONG BEACH

During 17–19 January 2020 over 400 exhibitors took stands in the Long Beach Convention Centre for the decorated apparel trade show and conference in California

Impressions Expo Long Beach 2020 offered opportunities for networking, education, new-product displays and more. Attendees expanded their industry knowledge with Impress U, the newly updated conference programme that offered 50 new seminars and 12 workshops. The Ink Kitchen's 'Shop Talk' series featured an array of speakers discussing various topics from all facets of the industry. Here are some show highlights:

NEW YEAR, NEW INK

Screen-printing inks have evolved in recent years. Impressions Expo Long Beach featured a few exhibitors pulling out all the stops for advancing their ink technology. PolyOne Specialty Inks launched its Zodiac Aquarius Digital Hybrid eco-conscious water-based ink system. Consisting of a white underbase and matte topcoat, the new inks are designed to protect and enhance digitally printed garments, producing a soft, matte finish; and vibrant colours, while also helping to improve wash durability. In addition to viewing live printing demonstrations throughout the show, attendees could explore PolyOne's comprehensive portfolio of screen-printing inks, from water-based and silicone to plastisol and non-PVC plastisol ink technologies from the company's Wilflex, Rutland, Zodiac, Union Ink and Printop brands.

MagnaColours also debuted a new product in the form of MagnaTrans, a new range of water-based inks, migration blocker, adhesives, fixer and films. The water-based inks are suitable for both traditionally screen-printed transfers and digital transfer printing systems. The base inks are available in white, neutral and black, with a collection of special-effects inks featuring metallic silver, two-tone, reflective, UV-reactive and glow-in-the-dark properties.

PRINTERS ARE TRENDING

Direct-to-garment (DTG) printing continues to elevate itself through advanced technology and the innovative combination of screen and digital printing. The Inkcups display featured the company's Brite, B100, ICN-2200PS and B150 pad printers, as well as the CobaltONE and Cobalt 2000 laser plate-makers. During the show, the Brite, B100, ICN-2200PS and B150 machines printed high-quality, one- and two-colour prints on T-shirts. Inkcups also gave live plate-etching demonstrations using the CobaltONE and Cobalt2000.

Chromaline revealed its newest product innovation: the ChromaCoat 20, a single-screen automatic coating machine. It allows for consistent stencil thickness, exposure times and print results, according to the company. Features include a full touchscreen panel, adjustable speed for fine-tuning emulsion over mesh (EOM), and single-hand adjustment for various screen heights. ■

Further information:
web: www.impressionsexpo.com/longbeach

FUTUREPRINT VIRTUAL SUMMIT

In response to the current crisis the world is experiencing, FM Future has announced the first FuturePrint Virtual Summit, taking place 2–4 June 2020

Free for all attendees and participants, the objective of the summit is to provide an online platform to connect the international print industry, to facilitate knowledge sharing, valuable networking, product and service updates and provide the inspiration and support to stimulate business during and beyond this very challenging period.

STAY SAFE, STAY CONNECTED

"In March, FuturePrint launched a series of webinars for April under the theme 'Stay Safe, Stay Connected', and these generated some surprising interest," recalled FM Future Director Marcus Timson. "So, we then thought why not extend this to provide a more significant level of content, across a wider spectrum of print?"

Graham Kennedy, Head of Commercial Inkjet Business at Ricoh Europe, is a strategic partner for FuturePrint and explained: "The FuturePrint Virtual Summit, taking place 2–4 June, will provide us with a really useful platform to connect and hear the latest thinking but to also share some of the projects and innovations that are being worked on. We look forward to the positive outcome it will have."

FM Future Directors Frazer Chesterman (L) and Marcus Timson

HOW WILL IT BE STRUCTURED?

It will run from 2–4 June comprising of pre-recorded and live sessions. The summit will include content on Commercial Print, Wide Format Print, Industrial Print and Packaging. The event already has the support of FuturePrint Partners Ricoh Europe, Integration Technology, Kavalan, Meteor Inkjet, Sihl, Sun Chemical, Global Inkjet Systems, Inca Digital, Memjet and Kao Collins.

If you would like to participate, promote, become a speaker, partner or simply discuss some ideas, contact Frazer Chesterman at frazer.chesterman@fmfuturenow.com ■

Further information:
web: www.futureprint.tech

DRUPA POSTPONED

Due to the spread of the Coronavirus, the drupa trade fair scheduled for 16–26 June 2020 at Messe Düsseldorf in Germany has been postponed until 20–30 April 2021

Messe Düsseldorf is following the recommendation of the crisis management team of the German Federal Government. In addition, a general ruling issued by the city of Düsseldorf on 11 March 2020 prohibits major events with more than 1,000 participants present at the same time.

"The decision [to postpone] was taken in close consultation with our advisory boards and sponsoring associations," emphasised Werner M. Dornscheidt, Chairman of the Board of Management of Messe Düsseldorf. "As their partner, we are currently doing everything in our power to reduce the economic losses suffered by our exhibitors.

"We would like to thank all partners for their excellent cooperation in making these difficult and time sensitive decisions," he added. "We are pleased that together dates were found so quickly in order to provide all those affected with reliability in planning."

drupa will return to Messe Düsseldorf in April 2021 (Photo: Messe Düsseldorf, Constanze Tillmann)

"A postponement of drupa was unavoidable," stated drupa President Claus Bolza-Schünemann. "The decision is therefore right and responsible. Many exhibitors start their logistical preparations middle of March – [the] announcement of the postponement enables all those affected to react now, reschedule and prepare for the event date in April 2021. The excitement for 'embrace the future' remains undiminished – also in 2021." ■

Further information:
web: www.drupa.com

FESPA TO RETURN IN OCTOBER 2020

Along with its co-located events, European Sign Expo and Sportswear Pro, FESPA's Global Print Expo will return to IFEMA, Feria de Madrid, from 6–8 October 2020

The three exhibitions, which were originally scheduled to take place from 24–27 March, have had to be postponed due to the disruption caused by the Covid-19 outbreak in mainland Europe.

"Despite the ongoing impact that the coronavirus is having on the speciality print sector, we've been overwhelmed by the strong demand from our global community for a FESPA platform in 2020," said FESPA CEO Neil Felton. "Therefore, we are extremely pleased to confirm that our shows will be going ahead on these re-scheduled dates and we're very grateful to the IFEMA team, who have been fully supportive of our decision under the extraordinary circumstances."

He continued: "Throughout this difficult time, we remain in close dialogue and consultation with our exhibitors to establish how FESPA is able to best support their 2020 product launches, engage with existing customers and nurture new prospects in the speciality print sector to fuel their future growth. We remain confident in the unique value of FESPA Global Print Expo for our specific stakeholder community."

FESPA will provide further updates regarding the events in due course.

UPCOMING FESPA EVENTS

- FESPA Global Print Expo, 6–8 October 2020, IFEMA, Madrid, Spain
- European Sign Expo, 6–8 October 2020, IFEMA, Madrid, Spain
- Sportswear Pro, 6–8 October 2020, IFEMA, Madrid, Spain
- FESPA Global Print Expo, 18–21 May 2021, Messe München, Munich, Germany
- European Sign Expo, 18–21 May 2021, Messe München, Munich, Germany ■

Further information:
web: www.fespa.com

DO YOU HAVE NEWS TO SHARE?

CONTACT: nicola@specialistprinting.com

Marabu donates disinfectant to hospital

German printing ink manufacturer Marabu is using its production resources to make disinfectant urgently needed as a result of the coronavirus pandemic – and is donating it to the RKH hospital in Ludwigsburg, near Stuttgart. Using equipment normally dedicated to digital printing inks, Marabu has converted selected production assets to the manufacture of disinfectant. Assuming the availability of the raw materials, much more will be manufactured at the main production site in Tamm.

The company has also formulated a hand and surface sanitiser that meets World Health Organisation standards. The enterprise is giving some of the products to its own staff, but donating the vast majority to the RKH hospital.

"We want to help those people who are working selflessly and beyond their limits to provide outstanding care to our fellow citizens," explained York Boeder, CEO of Marabu.

Over 2000 protective masks (including FFP2 masks) have been provided by Marabu's international subsidiaries, and these will also be donated to the hospital.

The entire workforce at Marabu is proud of their disinfectant

In addition, Marabu has provided a range of its Creative Colours products – including markers and paints for arts and crafts – for the day-care centre and playroom at the children's wing at the RKH in Ludwigsburg.

"Faced with the current, very difficult market for disinfectant and protective equipment, we are very grateful for any help," said Alexander Tsongas, Director of Communication at RKH. "It is wonderful that companies in the region are doing their part in the fight against Covid-19."

www.marabu-inks.com ■

Lüscher relocates to a new site

In February 2020, Lüscher Technologies moved to new premises in Oftringen, Switzerland. The new building is designed to meet current needs in terms of space and infrastructure, and to enable optimisation of production processes. The premises are conveniently located close to the Oftringen motorway junction, and feature a large showroom for hosting live demonstrations of machines. Lüscher welcomes visitors to the new building to discuss their customer-specific needs.

www.luescher.com ■

Lüscher has moved to these new premises in Oftringen, Switzerland

ColDesi releases virtual learning tool for marketing and business

US-based supplier of equipment for decorated apparel and promotional products ColDesi has launched 'ColDesi Daily', a web-based blog that provides industry professionals with resources to strengthen their marketing and business skills.

"Apparel decorators and others in our industry should take advantage of this time to not only improve their production skills but also their marketing and business skills," explained ColDesi's Director of Marketing, Mark Stephenson. "Let's learn and grow together during this time of uncertainty."

The company reports that the ColDesi Daily page will be updated with new learning material every day. The page features sections on marketing tips, selling and business advice and the material is in the form of both articles and videos to cater to different learning styles. These learning modules include lessons on how to get found online, using YouTube, Facebook posting tips, and lessons in paid advertising.

www.coldesi.com ■

GIS responds to customer feedback with latest Atlas software

Version 3 of GIS's industrial print Atlas Graphical User Interface (GUI) software now includes interface options and language packs for improved usability and functionality.

Developed specifically for system builders and end users, Atlas Professional and Production GUIs allow OEMs to create targeted interfaces for end users. The GUIs include tools for system configuration and monitoring, job submission and tracking, machine maintenance and print quality enhancement. Specific UIs are also available for various applications including labelling, corrugated, glass, direct-to-shape, varnish, and security.

Key V3 release features include separate Atlas Professional and Atlas Production UI platforms to cover a wider range of end users, and language packs for English, Chinese, Korean, Japanese, German, Spanish, Italian. The software also offers enhanced system configuration tools; new printhead support; job submission and tracking; and advanced drive electronics UI configuration.

"This latest release of our Atlas Professional user interface is part of our continuous development, strengthening our software product offering," said Nick Geddes, CEO. "We have listened to our customers, and the free language packs are an example of GIS responding to customer feedback."

Chinese, German and Spanish example language variants from GIS Atlas Professional GUI v3

Atlas Professional software is available now to GIS customers.

www.globalinkjetsystems.com ■

IIJ goes extra wide

With the packaging and décor markets requiring ever wider systems, Industrial Inkjet has responded with the MonoPrint 775i. This new system can print up to 160m/min at 360 dpi or 80m/min at 720dpi. IIJ's design has been developed to be capable of printing up to four colours at a maximum print width of 845mm wide when using Konica Minolta's 360dpi KM1024i printheads, or 891mm when using 600dpi KM1800i printheads.

www.industrialij.com ■

KNF releases low pulsation pump

The new FP 150 multi-diaphragm liquid pump from KNF is suitable for applications including medical devices, diagnostic instruments, laboratory equipment, industrial inkjet printing, semiconductor, fuels cell and cleaning & disinfection applications.

KNF's FP 150 pump offers linear flow adjustment from 0.2 to 1.5 l/min, low pulsation and continuous duty up to 2-bar pressure

Using five diaphragms to provide smooth laminar flow, pulsation values are said to be typically below 150 mbar (at the pump outlet) at nominal flow rate and lower still depending on system configuration and running speed. Benefits include greater pumping efficiency, greater flow through your system at lower pressure and no vibration of the pump and tubing – resulting in less stress on system components.

The pump is driven by a 5-wire brushless DC motor with integrated electronics offering linear speed control via either a 0 to 5V control voltage or an inverse PWM signal. Due to the stability of the pump and the laminar flow it produces, flow rate can be adjusted between 10% and 100% of the nominal flow rate with outstanding linearity.

The FP 150 is stable against back pressure (up to 2 bar) and, with a PTFE-coated diaphragm as standard (FFKM is an option on request) and a choice of FFKM or EPDM valves available, it can pump a wide range of challenging fluids.

During its development, the FP 150 was intensively tested at original equipment manufacturers in the USA, UK, Italy and Israel.

www.knf.com ■

Global Graphics accelerates product launches

Global Graphics' CEO Mike Rottenborn is taking active steps for the future

Despite the postponement of drupa, Global Graphics' companies Global Graphics Software, Meteor Inkjet and Xitron are accelerating product launches intended for the show.

"We stand shoulder to shoulder with our industry colleagues, partners and employees during this difficult period and look forward to participating in drupa in April of next year," said Global Graphics' CEO Mike Rottenborn. "In the meantime we are not treading water."

On 28 April the company held a worldwide 'virtual' rollout for Direct, a new software platform for digital presses.

"Direct is the first fully integrated product line from Global Graphics," Rottenborn explained: the platform features Global Graphics' Harlequin RIP technology, Mako for file optimisation, ScreenPro and PrintFlat products for inkjet digital printing, tight integration with printhead drive electronics and software from Meteor Inkjet, workflow for labels and packaging from Hybrid Software, and the global reseller network of subsidiary, Xitron.

Global Graphics plans to resume normal trade show activity in the autumn with a group presence at LabelExpo Americas and Printing United.

www.globalgraphics.com ■

Smart dryer from Lawson can be controlled by phone

Designed for curing digital, water-based, and plastisol inks, Lawson Screen and Digital Products' Digi-Star Elite dryer utilises SCR [silicon controlled rectifier] power controls for fast, precise control to optimise energy efficiency and consistency. Items that pass through the chamber are cured using a combination of convection jet-air and infrared radiation.

The smart dryer is equipped with wi-fi, allowing users to control it remotely via smartphone or tablet or with the attached touchscreen. This use of technology makes it possible for the dryer to remember numerous setting combinations for quick and consistent use. For example, a user can save settings specifically for dark polyester garments, DTG printed inkjet on hoodies, and screen-printed water-based ink on cotton and can switch between them easily. As users modify the settings, these changes are logged; print managers can then see who made what changes and when.

The Digi-Star Elite has a compact chamber design with customisable chamber and belt dimensions. Access to the heat chamber does not require tools, for easier maintenance.

www.lawsonsp.com ■

Lawson's Digi-Star Elite dryer features smart technology and touch screen controls

Zünd expands its presence in the French market

At the beginning of 2020, Zünd Systemtechnik took over its official sales and service partner Grafitroniks, which now operates under the name Zund France. Zünd Systemtechnik's partnership with sales partner Fogepack, which has been in place since 2003, will continue.

Zund France is operated in Vitry-sur-Seine, a few kilometres from Paris, by 15 employees who take care of a cutter fleet of over 800 systems. A separate demo room offers customers and prospective customers the opportunity to experience the diverse possibilities of digital cutting technology on site. The employees are trained experts in consultation, training, installation and service.

"We are very pleased to welcome Zund France into our global group of companies," said Oliver Zünd, CEO of Zünd Systemtechnik. "We would like to further strengthen the business in France and expand the customer base through the close cooperation with our new subsidiary and our sales partner Fogepack.

"The resources available to us as well as the extensive experience of our French partners will make it possible for us to continue to grow and further optimise our customer support," Zünd concluded.

www.zund.com ■

Hendrik Koemans has joined Inkcups as Sales Director for Europe

Inkcups appoints Europe sales director

Hendrik Koemans has joined Inkcups as Sales Director for Europe, having worked in the European print industry for over 26 years. Prior to joining Inkcups, Koemans spent most of his career in sales and marketing with Philip Morris International and in a key account management role at Berendsen Hygiene and Textile.

"Hendrik's wide network and expertise in the promotional market will open up many doors and opportunities for Inkcups in Europe," said Benjamin Adner, CEO of Inkcups. "This move is part of a plan and commitment to build up our presence in Europe as the market grows and our customer base there expands. We are thrilled to add Hendrik to our team," he added.

"I am pleased to be working with Inkcups and excited about this grand opportunity," said Koemans. "Having worked with the company for many years as a customer before, I can attest to the quality and value they offer."

Inkcups has also expanded the number of local service technicians to better service existing and new customers in Europe. Koemans and the new technicians will be based out of Inkcups' Europe office in Germany.

www.inkcups.com ■

Drytac advises on deep cleaning without damage

Museums, photo studios, retailers, schools and many more sites will have a range of graphics materials installed that will need to remain safely intact and in a good visual condition after cleaning with disinfectant chemicals. Wall murals, decals, floor graphics, window displays and signage may all need cleaning, but how to approach this will depend on the graphics material, especially that of its overlaminate product.

Drytac's range overlaminating films will withstand cleaning with everyday commercially available cleaning agents and disinfectants, but for more intense cleaning it's important to check the film's chemical resistance.

PVC has good resistance to aliphatic alcohols such as isopropanol, a widely used disinfectant within pharmaceutics and hospitals and dilute acids/bases found in common cleaners like bleach. However, organic solvents such as ketones (for example acetone), aromatics like toluene, and esters should be avoided as they will damage the PVC material.

Polypropylene (PP) has a similar resistance to that of PVC and is also durable against esters. PET can withstand cleaning with all of the above, including organic solvents.

Regardless of the film type, graphics should be washed with a soft non-abrasive wipe to avoid surface damage and scratches. Extra care should be taken with exposed edges; chemicals and liquids can detrimentally affect adhesives if given the opportunity to ingress. This is especially crucial on floor graphics, as reduced adhesion could result in a tripping hazard – and of course these are the graphics likely to be cleaned more often.

www.drytac.com ■

Valiani assists with Covid-19 PPE production effort

Italy-based producer of flatbed cutting machines, Valiani, has joined the list of institutions, businesses and individuals supporting initiatives to assist with the coronavirus emergency.

The company has purchased TNT (non-woven) material and allocated all of its showroom machines and part of its workforce to help the Certaldo (Florence) community by cutting masks for personal protective equipment (PPE). Valiani collaborated with the sisters of SS Maria Bambina institute from Certaldo, who worked in sewing and packaging of hundreds of masks for the project.

www.valiani.com ■

Valiani is working with the sisters of SS Maria Bambina to produce PPE masks

Saati celebrated for strong 2012–2018 performance

Saati Group SpA appears in the top 200 Italian companies with 120 and 500 million euros in turnover. A survey was conducted by the ItalyPost Study Center to determine the Italian companies that performed best between 2012 and 2018. Available on the ItalyPost website, the survey divides the 1000 best Italian companies into two categories: the first for businesses with 20–120 million euros in turnover, which names 800 'champion' companies; the second category comprises the top 200 Italian companies with €120–500 million turnover. Saati's ranking means the company is named a 'superchampion business'.

Mangogna, CEO of Saati, commented on the news: "It is not a good time to express pride, even if I confess that I feel proud. However, it is the best time to express my gratitude to all of our employees who are fighting to keep Saati operative these days and for everything they have done to deserve this award. Thanks!"

www.saati.com ■

Industry-specific information on Covid-19

SGIA, NAPCO Media, and Printing Industries of America (PIA), and its affiliates have joined forces to launch a resource channel to provide the printing and graphic communications industry with up-to-the-minute news and resources on Covid-19 and how to navigate the latest information about the pandemic.

Content is updated daily to provide easy access to guidelines and best practices as recommended by leading government agencies, such as the World Health Organisation and Small Business Administration, as they pertain to the printing industry and relevant operations and procedures.

"We are at a critical time in the industry right now," said Ford Bowers, President and CEO, SGIA. "It became apparent that our community is desperately searching for answers and the latest information on Covid-19 and how it is affecting business operations. As legislation and new mandates are changing daily, sometimes even more frequently, we worked quickly to assemble experts from across platforms to engage swiftly to track and monitor these updates, so that we could provide the resources, together, in one easily accessed location.

Content on the Covid-19 Resource Channel is provided daily by industry leaders in subject areas, as follows:

- State and Local Legislative Updates: Marci Kinter, Vice President, Government Affairs, SGIA
- National Legislative Updates: Lisbeth Lyons, Vice President, Government & External Affairs, PIA
- Safety Updates: Gary Jones, Director, Environmental, Health and Safety Affairs, SGIA
- Economic Impact on the Printing Industry: Andy Paparozzi, Chief Economist, SGIA
- Human Resource Updates/Guidance: Adriane Harrison, Vice President of Human Relations, PIA

www.sgia.org ■

Vastex replaces BigRed 3 with faster, quieter high-capacity dryer

The new EconoRed ER-III-30 dryer from Vastex has a 76cm-wide belt and three 61cm-wide, 3,600-watt heaters (total 10,800 watts), enabling it to cure 475 garments/h printed with plastisol ink, or 150/h printed with water-based ink or discharge. An EconoRed III-30-2 version equipped with an additional heating chamber (total 21,600 watts), allows doubling of belt speed, curing up to 950 garments/h printed with plastisol ink, or 300/h printed with water-based ink or discharge.

With the Vastex Infrared Focusing System, the heaters can be adjusted to any height 5–17cm above the belt, allowing the operator to compensate for varying garment thicknesses.

Vastex has stated that the EconoRed dryer is over 20% quieter and 13cm narrower than its predecessor – owing to its top-mounted exhaust system, which allows positioning of the control box on the right (standard) or left side of the enclosure to suit shop layouts. The new exhaust system draws in filtered air that cools the outer skin of the dryer while a 10.75 CMM exhaust system evacuates moisture and fumes from the heating chamber. (The two-chamber model includes a 21.5 CMM system.)

EconoRed dryers are supplied with a digital PID temperature controller accurate to =/- 1°, allowing the operator to repeat or fine-tune drying results.

EconoRed III-54 models with 137cm wide conveyor belts "will soon follow," said Vastex President Mark Vasilantone.

www.vastex.com ■

Vastex' EconoRed ER-III-30 dryer cures plastisol, water-based and discharge inks

Taylor Landesman is a NASMA Executive Committee Member and Vice-President of Lawson Screen & Digital Products

NASMA update

NASMA (North American Specialty Manufacturers' Association) is comprised of industry leaders specialising in understanding the screen and digital imaging industry. While focusing on North America, our group takes a holistic approach to how manufacturers can better serve the needs of a rapidly changing imaging industry. The more we know about each other, the more we understand the nature of the imaging and print community, the better service we provide.

Having wrapped up our most recent meeting, I came away excited about the changes happening in the printing world. First and foremost, in case you had any doubts, digital printing is here to stay. While there will continue to be a place for screen printing, more and more people and processes are going digital. The scope and scale vary, but include direct-to-garment (DTG) and hybrid screen printing. All size print shops are phasing in digital production.

Current digital methods are limited by suitable material types and production costs for long runs. For example, DTG has only been perfected for 100% cotton and production costs can be quadruple when compared to traditional screen printing.

Despite these current challenges, manufacturers understand the need to 'go digital.' This will manifest itself in two ways. First, hardware advancements are already increasing the spectrum of printable items. Second, improved and refined processes will benefit the quality and longevity of the finished product.

Make sure to stay tuned because while the methods may change, the decorated garment is still here to stay.

www.nasma.info ■

Report by Taylor Landesman, NASMA Executive Committee Member and Vice-President of Lawson Screen & Digital Products

NASMA North American Specialty Printing Manufacturers Association

AT A LOSS FOR WORDS

Frank Toma tries to stick to business as normal amid the far-reaching effects of the Covid-19 Virus, and considers the implications of the first Eurasia REACH

Frank Toma

Yesterday I received a mail from Nicola Penhallow, the publisher of *Specialist Printing Worldwide*, reminding me of my 'duty' as the chairman of the ESMA HSEP committee to provide an article for this edition of the magazine. Fact is, I had a reminder in my Outlook just a week ago. And still I completely forgot it. Because, honestly, with the Covid crisis going on, it is quite difficult to stick to business as usual.

It is difficult to talk to my customers about the poison centre issue with deadlines years away when they don't even know how to get through the next few months.

It is difficult to conduct training for employees when social distance is necessary.

It is difficult to keep an eye on work safety when safety advisors like myself are not allowed to enter company premises.

HSEP COMMITMENTS

It is even difficult to hold our next Health, Safety and Environmental Protection (HSEP) meeting. This will happen now, for the first time ever, as an online conference. I'm looking forward to this with mixed feelings, since I'm not a great fan of online meetings. But since we come from all over (western) Europe a physical meeting would be next to impossible right know. Still I wonder: with people in the HSEP committee from Italy, Great Britain, Germany – will it really be as interesting as usual [to discuss] what happens with chemical regulations all over the world? Difficult for me to imagine right now.

EURASIA REACH

After all these thoughts, there something that signals a semblance of normality: following many other countries, there will be a Eurasia REACH [Registration, Evaluation, Authorisation and Restriction of Chemicals], involving Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan). It is expected to come into force on 2 June 2021 and requires the registration of substances (the first step) and mixtures (the second step). Manufacturers and importers or nominated representatives will be responsible for registration.

Many points of the regulation, including deadlines, are not currently very clear. What can be said is that there will be a distinction between existing chemicals, which require only a fairly simple record-keeping registration, and new or restricted chemicals, which will require an authorised registration from a competent authority of one of the member states. Record-keeping registrations are valid indefinitely; authorised registrations will be valid for five years, after which a new authorisation will be necessary for restricted chemicals or a record-keeping registration for new chemicals. There is no low volume exception for new chemicals, so all new chemicals have to be registered. And since the regulation also covers mixtures (with deadlines ranging from 2027 up to 2033), there is much work ahead for companies delivering chemical products to the aforementioned countries.

That's all for now. Stay healthy! ■

Sources used:

- *Presentation made by Anna Szlezak (FujiFilm) at the HSEP meeting in Firenze, Italy in November 2019*
- *Chemical Watch website*

Frank Toma is Chairman of ESMA's Health, Safety and Environmental Protection Committee, and Safety Officer at ENVISAFE Consulting

ESMA
Driving Print Excellence

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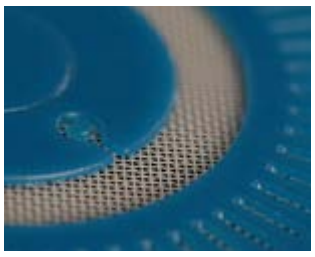

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