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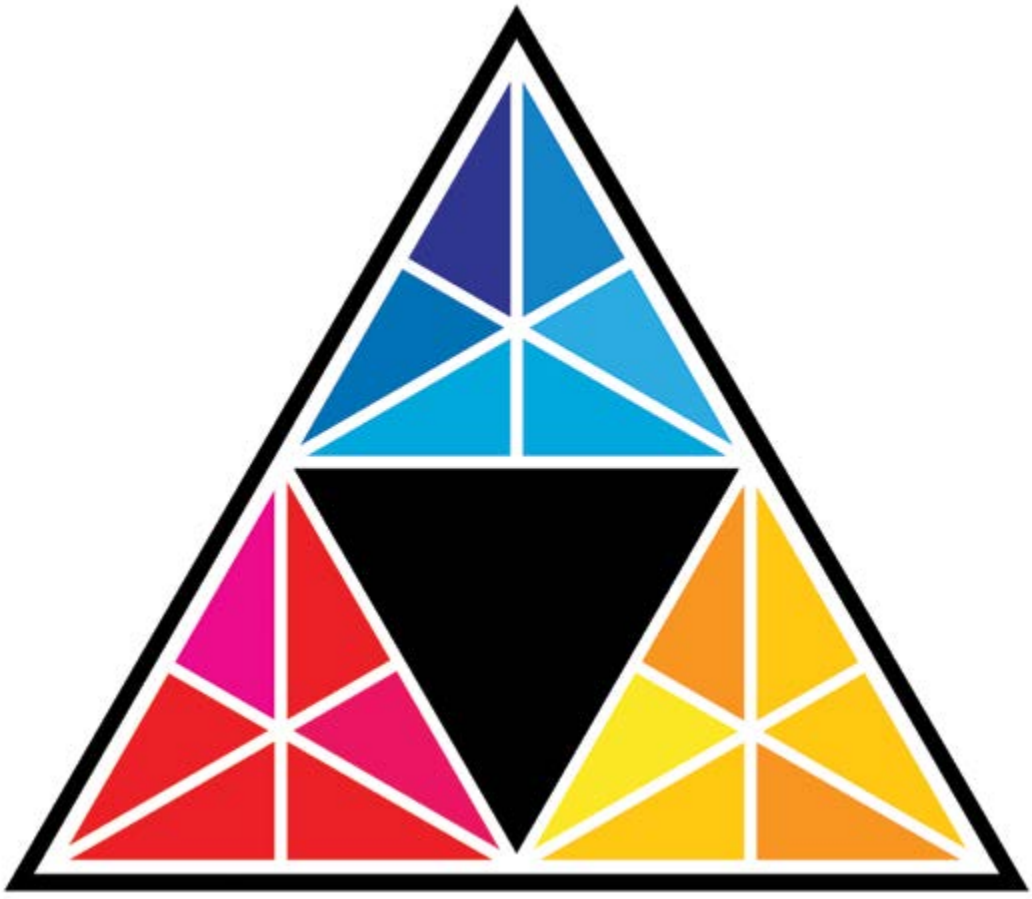

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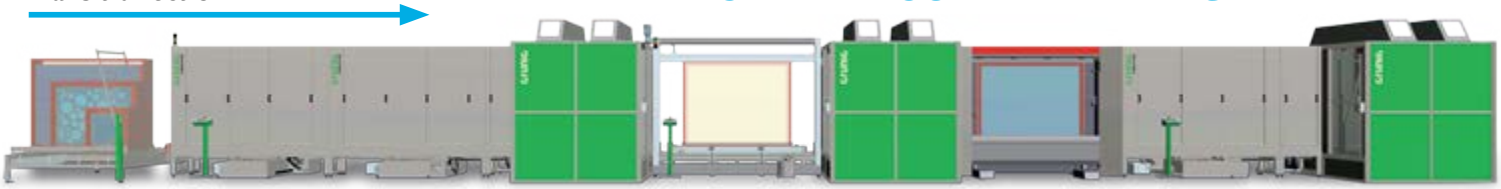

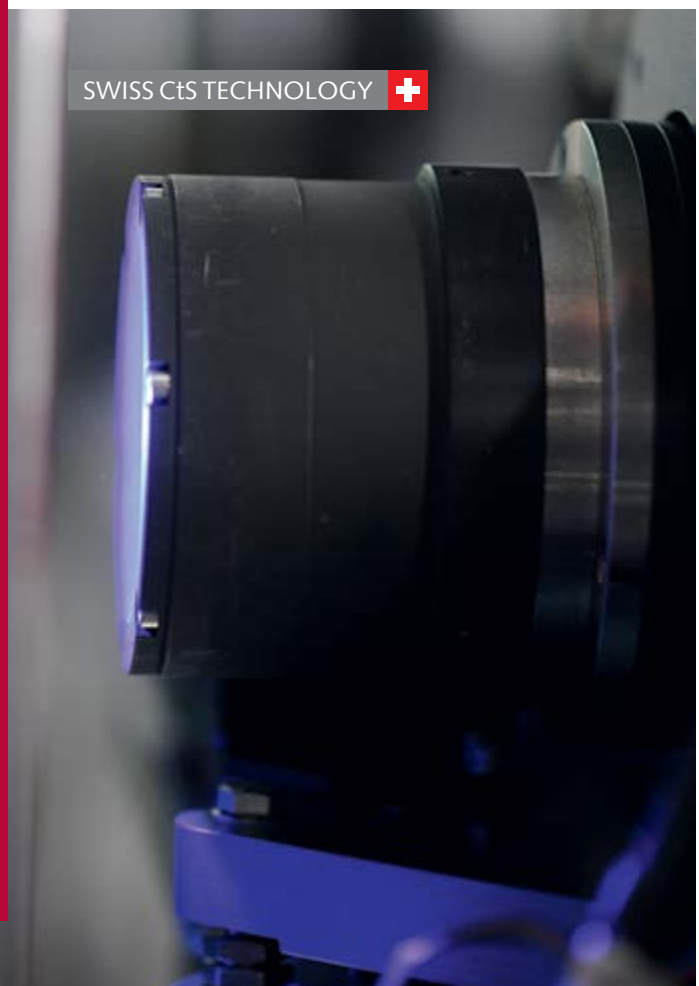

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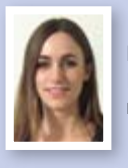

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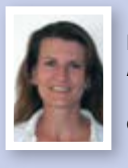

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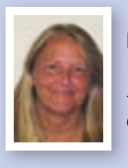

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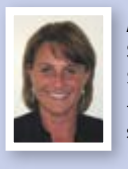

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A FINE ART

Will compressed files invariably lead to bad print results? Charlie Facini explores the origins and implications of JPEG compression

The letters JPEG represent a group that met on a regular basis to discuss and create standards for still image processing and compression to be used and transferred over the NEW Internet in the 1990s: 'Joint Photographic Experts Group.'

The .jpg format was originally developed to minimise the size of photographic image files for transport at a time in the 1990s when the Internet had very low bandwidth, and not for production use. If accepted, the full quality image was then shipped via a more traditional method, ensuring the best print result. Never intended to be a format used with images destined for print, it was meant to be a thumbnail or reasonable representation of the higher quality original image that could be e-mailed through a slow Internet. So, why is the .jpg format used often and widely today in all print industries, including screen-printing, when quality is lost?

They say, you can't fight City Hall, but I say you stand a much better chance with City Hall than you do the masses on the Internet. Once the masses grab hold of something, for better or worse it stands a good chance of becoming a 'standard' regardless of its original intent, capability, or lack thereof. The .jpg format became a fast and easy way of sending images from just about any software. The associated issues began when compressed images were used for print production – and they remain widely used today. Artists take the creation process seriously, although these same artists may simply be in the dark about the file formats they select and the compression methods involved in the saving process. Once enlightened they may change their ways, ultimately improving their image reproduction.

The colour and quality corruption that JPEG compression causes (although there are many levels of compression, all result in a loss of quality)

SOME CLARITY

Although .jpg has come a long way since its humble beginnings, make no mistake: it is still a 'compression format'. There is good compression and bad compression in regards to image quality. Good compression is LZW or ZIP that compresses a file based on code, replacing redundant code with flags (markers) that take up less space. When the file is opened the flags are replaced with the larger original code, allowing the file to open as it was originally. This causes no loss of quality to the file (image) itself. Good compression is therefore known as lossless compression.

Bad compression is .jpg that compresses by removing colour (data). Already you can see that this is bad for any image. To reduce the file memory size, .jpg removes colour shades and hues it deems NOT needed to deliver a 'fairly good' representation of the original. Those colours never come back. Think of it as posterization, reproduction with solid tones or colours and little detail from continuous-tone originals or photos, and you have a good idea what is going on here. Zoom in on a .jpg file and you will see the compression cubes on screen – the boxes created when the data was extracted/altered. These things affect printing.

JPEG in many cases has a 'quality' slider that compresses less, but it seems odd to use the term quality when all levels are causing a loss of original quality. In today's world you will frequently get .jpg files; in some cases you will have no other option than to use them, but now you know what they are, what level of quality to expect, and to ask for the file in an 'original uncompressed' format if supreme quality is needed. By the way, re-saving an already compressed .jpg file to another format does not restore quality.

YOU CAN NEVER GO BACK

Once a file has been compressed using JPEG, colour data has been extracted and lost forever. [Saving] a file as a .tif (TIFF) or any other format will not restore the image. It remains the same. The key is to never let the file become compromised.

JPEG is a raster (pixel)-based format. Saving a vector-editable file as a .jpg loses all the vector properties converting the file to a 2D raster based image. We often see this: a file arrives that looks like it was created in a vector app, but it arrives as a .jpg. The client wants to do 'this and that' with the file, but it is no longer possible. Asking the client to supply the original vector file solves most issues. Why take a perfectly good and useful vector file that is fully editable and scalable, then convert it to .jpg before sending it to a printer for reproduction? The answer is they were more concerned with the ability to e-mail the file, and/or uneducated on what is ultimately needed to deliver the best-finished product to avoid the results associated with compression. Always speak up; ask for the original vector file, especially when you suspect it exists.

ACHIEVING THE BEST PRINT RESULT

Now it should make sense that all good cameras come with a RAW mode. RAW is uncompressed and usually saves as a .tif (originally TIFF – tagged image file format). RAW is the best quality. All other settings in the camera are a form of compression, usually .jpg. Use RAW mode when quality matters. In the graphics industry quality should always matter.

There is some good news though for .jpg format users working in the screen print industry. Don't panic when many of the stock images or supplied art are .jpg files. With humble line screens and a process that has less stringent resolution requirements than other applications, you will find many occasions where that loss of image quality does not have to mean a lousy printed piece is imminent.

To improve your odds of success on-press, use the .jpg image at 100% size or smaller. Understandably, enlarging it exposes the issues and is not recommended. Armed with this information, you can make the call on when and how to use the file format. Certainly you should save your custom-created images with a lossless format. TIFF is a favourite.

JPEG happens. We can't always get our clients to supply files in other formats. When you separate a file that has been JPEG-compressed, the compression is visible. You will see a mosaic of compression cubes throughout the image/separations that are undesirable. There is a way to work around this. The sim process engine in Spot Process, for example, uses an algorithm that is truly unique. As part of the RGB decompiling happening during the automated colour separation procedure, a smooth tonal underbase, overprint white and a black separation are each created, which improves the overall look of a separated and printed piece produced from a .jpg file.

A good start is a good finish. But, when a .jpg file is your reality, you now have knowledge to make the best out of a compromised (compressed) file. ■

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TEMPLATE FOR SUCCESS

Patrick Brunner offers advice on stencil treatment and exposure to ensure reliable, high quality results

Error-free stencils are enormously important in an industrial environment. For instance, if defects are detected in the press when printing automotive dials, plastic bottles or plastic tubes etc., the whole printing line can come to a stop for hours.

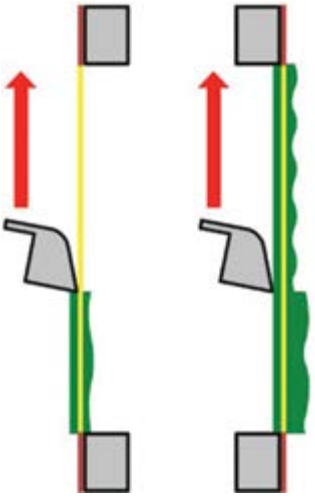
To produce perfect prints, the following points should be noted:

1. PREPARATION OF THE SCREEN

Degreasing: We always recommend degreasing screen printing mesh, even if direct from the manufacturer. If degreasing is not possible in an efficient way, use gloves during the previous stretching process in a dust-free workspace.

2. COATING WITH PHOTO EMULSION

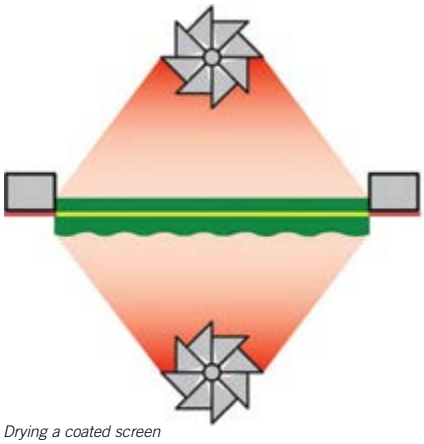
The base coat takes place 'wet in wet': starting from the substrate side with one or two coating steps, following one or two coating steps from the squeegee side in order to push the emulsion back to the substrate side.



Coating with direct emulsion

When coating with a coating machine, the procedure is very similar. Both sides are coated simultaneously, but the coating trough on the substrate side runs ahead, therefore the coating trough on the squeegee side is also pushing the emulsion to the substrate side. This creates build-up called EOM (Emulsion Over Mesh) on the substrate side. The build-up smooths the mesh structure. To prevent the build-up on the substrate side flowing back to the squeegee side, the coated screen should dry substrate side down in the drying cabinet. Large coated screens should dry upright.

A too-pronounced structure on the substrate side leads to bad printing results, since the ink can escape at the edge of the open mesh area, producing the so-called 'saw tooth' effect. Conversely, too high a build-up could create tonal value shifts because the ink deposit in open areas is created by the mesh thickness, but in fine details by the entire stencil thickness. An excessively high build-up can also make it difficult to maintain a proper ink release, leading to an incomplete transfer of the ink to the substrate. For instance, fine characters printed on a plastic tube with black UV-inks would create 'saw tooth' with a too-thin coating, while too thick a coating may lead to curing problems.



Drying a coated screen

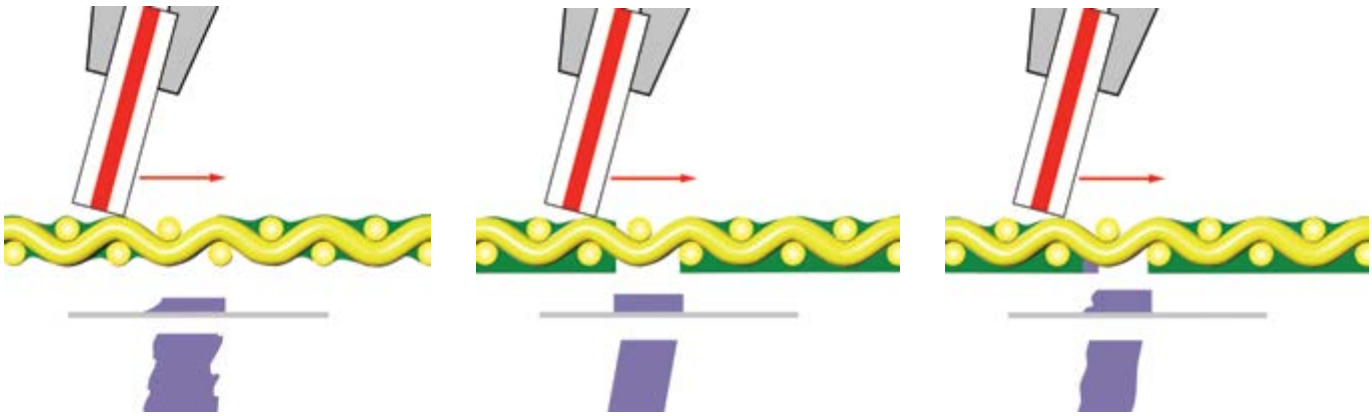
Additional coating: If the surface roughness has to be further reduced after the base coat, additional coating can be applied. The benefit of an additional coating results in an only marginal increase of the build-up, but in a remarkable reduction of surface roughness.

That is the 'art' of stencil making. An optimal stencil should have a low build-up, but a smooth surface roughness. How to achieve this goal depends on the materials used – from the viscosity or from the solid content of the emulsion, as well as from the geometry of the coating trough – if it is hand- or machine-coated and from the coating speed, etc.

Emulsion types: There are three different types of emulsions used in screen printing: diazo emulsion, photopolymer emulsion and the so-called 'dual cure' emulsion, a combination of diazo and photopolymer. While diazo emulsions have a poor water resistance, it is possible to design photopolymer and dual cure emulsions with effective water resistance. On the other hand, if strong solvent-based inks are used, photopolymer emulsions may react more towards them. Diazo and dual cure emulsions are relatively unreactive towards solvents.

The exposure behaviour between these three emulsion types is also different: photopolymer has a short, diazo a medium and dual cure emulsions a long exposure latitude. The exposure latitude indicates the range between 100% exposure time (all stencil thickness polymerised, with no more monomers on the squeegee side) and the maximum exposure time without loss of relevant artwork details (the mesh coloration also plays a role here).

Continued over



(L–R) Coating too thin; correct coating; coating too thick

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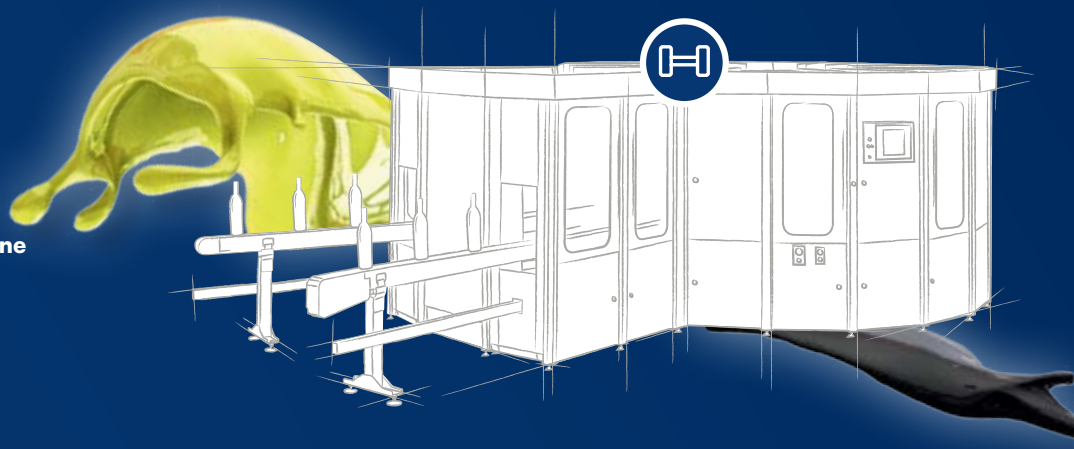

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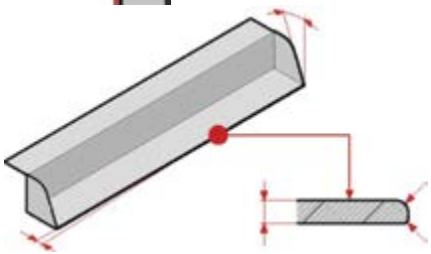
Additional coating can further reduce surface roughness



Geometry of a coating trough

3. EXPOSURE

Step exposure: This is used to determine the optimal exposure time of a particular standardised coated screen. This method has to be applied for every single stencil type (mesh, emulsion type and coating thickness). Essentially, it is recommended to aim for a complete exposure, with no more water-soluble monomers on the squeegee side of the stencil. This guarantees the best printing quality, the highest mechanical or chemical resistance and, if a screen is to be re-used, it is easier to reclaim.

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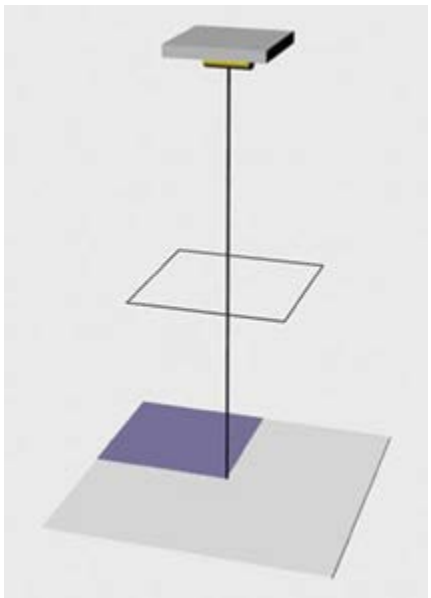
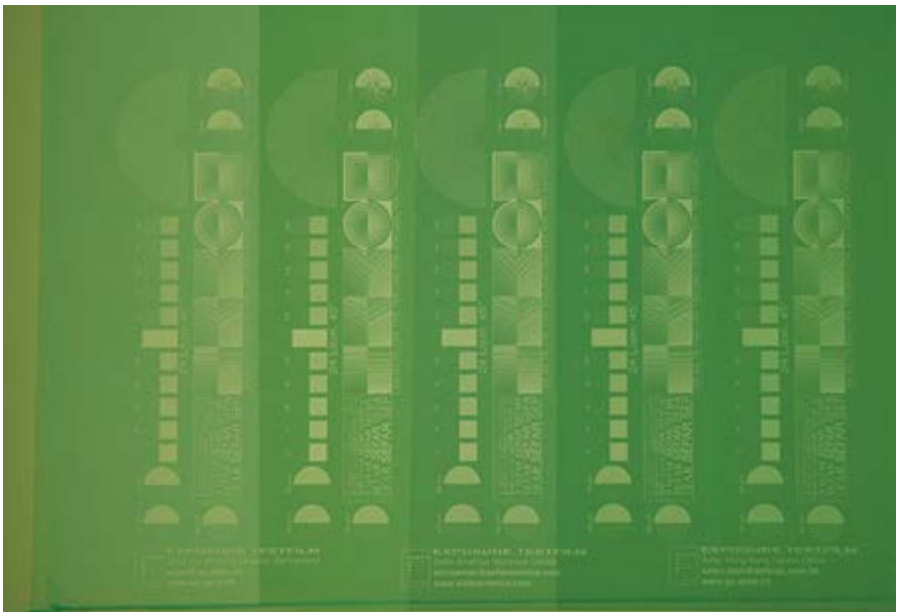
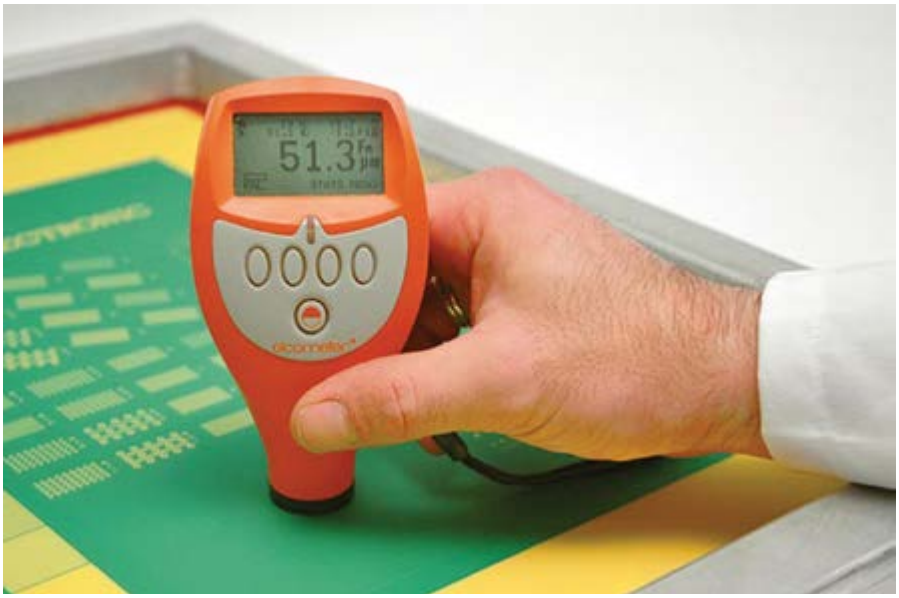


Exposure distance: light energy decreases with increasing exposure distance



Step exposure determines the optimal exposure time for each coated screen



Measuring thickness with a thickness coating gauge

Surface roughness gauge

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With a radiometer the effectiveness of the exposure bulb can be checked

Since exposure bulbs are subject to aging, affecting the invisible UV-A spectrum responsible for the hardening process, [exposure time] will continuously decrease – so check them two to four times per year.

To obtain a step exposure, a film positive with a repeat of five to ten times or more of the same artwork is required. The artwork should contain elements of fine lines, halftones and small letters in order to check the resolution. The step exposure is going to be conducted by means of a UV-A opaque foil, whereby after each exposure step, one additional artwork field is going to be covered. In this way a stencil with continuous increasing exposure time per artwork field is produced. The exposure time per step should be chosen in such a way that the first artwork field is clearly underexposed and the last clearly overexposed.

After developing, the step exposure will result in a stencil with colour gradients. The 100% exposure has been reached at the field where the colour is not changing anymore, [compared] to the next field with an additional exposure step. Based on the control elements of the artwork at the 100% exposure step, the resolution can be checked. The limitation of the mesh regarding resolution should also be taken into account here. Fine details which the emulsion may still reproduce but are blocked by thread material are not printable. The limitation of the resolution with yellow dyed mesh and a proper film positive is actually given by the mesh. Therefore, stencils can always be 100% exposed without hesitation.

Exposure distance: With increasing exposure distance, light energy decrease is squared: e.g. at double the distance, the exposure time has to be increased four times.

Light spectrum: The spectral sensitivity of Diazo lies between 360–420 nm; photopolymer: at 320–360 nm and dual cure at 320–420 nm. The range of 320–420nm also corresponds to the spectral emission, which a copy bulb should cover.

Generally, it can be said the shorter and the more effective the exposure time, the better the copy result.

Glass of the copy frame: The spectral absorption of the glass depends on its properties. A common appliance glass is not recommended because it will absorb the majority of UV-A light up to approximately 360nm. More suitable are special glasses supplied from screen printing goods retailers.

Computer to screen (CTS): The commissioning of a CTS system does not change the basic process of stencil production. Regardless of the type of imaging, the sub-processes of stencil production should be coordinated and controlled. The undisputed advantages of CTS direct-exposure systems are: accelerated stencil production and, especially in connection with inline systems, significantly improved reproducibility, since several sources of error are eliminated and manual processes are automated.

4. INSPECTION DEVICES

The entire stencil thickness as well as the build-up (EOM) can be measured with a coating thickness gauge, while a surface roughness meter allows stencil roughness on the substrate side to be assessed. To get an optimal average reading, the surface roughness meter should be placed 22.5 degrees angled to the thread alignment.

A possible method to work out optimal stencil parameters without the aid of measuring instruments may be the combination of a step coating and a step exposure. After the print of such a test stencil, the most suitable stencil parameters can be justified on base of the printing quality.

Radiometer: With a radiometer the effectiveness of the exposure bulb can be checked – this should be done at least twice a year. Unfortunately, the intensity of the UV-A range decreases the fastest. This is why a purely optical control is not possible; i.e. the exposure bulb always shines brightly, even if the exposure time has already multiplied. A worn exposure bulb will cause higher energy consumption and copy quality will also start to suffer due to increased light scattering and thermal influences. ■

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FEELING THE SQUEEZE

Tiffany Rader Spitzer discusses the big impact a small piece of rubber can make in screen printing

The squeegee is one of the most important pieces of 'equipment' in a screen print shop. This small piece of rubber can ruin jobs, delay production and end up costing big money in mistakes. Choosing the right squeegee for each job is simple, once you know what to look for.

Material type, blade profile and durometer are going to be the first considerations for best textile printing. The next considerations will need to be the variables: angle, sharpness, pressure and speed of the squeegee.

MATERIAL

Squeegees are made from three basic types of materials: rubber, neoprene, and polyurethane. The most popular within the screen printing world is polyurethane. Most urethanes used in the screen printing industry are MDI (methylene bis diphenyl diisocyanate)-based polyester. The reason being that MDI urethanes offer the best abrasion resistance of any urethane on the market. Polyurethane is also known for its durability and performance with a wide variety of ink systems. Squeegees made from polyurethane are the most popular in the textile industry.

PROFILE

The blade profile is a cross-sectional shape of the blade's printing edge. In garment screen printing the most popular shape is the traditional straight or square-edge squeegee, 90-degree square edge profile. There are also single bevel, double bevel, bull nose, among others; however, not typically used except for specialty applications. In this article we will be referencing the 90-degree edge. The profile is what will determine how much force the squeegee provides, which in turn affects how little or how much ink is deposited through the mesh and the effectiveness and control of that lay down.

Other areas that can affect this part of the printing process are off contact, mesh count and tension as well as the viscosity of the ink. You can check the efficiency of the squeegee blade by examining the screen once the squeegee has finished printing. If there is a lot of ink left in the screen, you have not properly sheared the ink out of the screen.

Single and triple Durometer squeegees

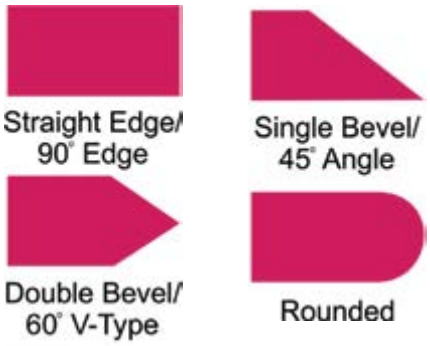
DUROMETER

Durometer is the hardness of the squeegee based on the Shore Hardness scales. This was created to provide a common reference point when comparing different materials. Shore Hardness is measured using a durometer gauge, which uses a spring-loaded steel rod to compress the surface of the squeegee material sample and provide a reading. The higher the durometer, the harder the squeegee rubber will be. The durometer selection will be based on your screen mesh selection and what you are printing on (the substrate). If your garment or substrate is smooth, such as a smooth polyester or polyester blend, a harder durometer squeegee around 75A should be used. If the garment has a rough surface it will require a larger, lower mesh count and a squeegee durometer between 65A and 70A should be chosen. Softer durometers are typically used on manual presses or lower pressure or lower speed machines. While slightly harder durometers typically are used for automatics. Most manufacturers colour-code their squeegee durometer. Unfortunately most printers are unaware that colours are not standard and when they order 'red' from their distributor they might as well be ordering 'rubber'.

There are single, dual and triple durometer squeegees. The most popular in garment screen printing is the single. However, the most recommended is triple durometer, which 'sandwiches' a harder durometer squeegee (typically 90A) between two softer pieces of squeegee. This sandwiched piece helps to control deflection and allows for less squeegee rollover and better shear to the ink. Dual squeegees are two different durometer squeegees placed together and can be beneficial because they can be switched for different inks and application. For the purpose of best printing over the widest range of options, triple durometer works best.

ANGLE

The angle of the squeegee blade to the screen (horizontally or parallel to the screen) can affect how the squeegee prints or shears the ink.

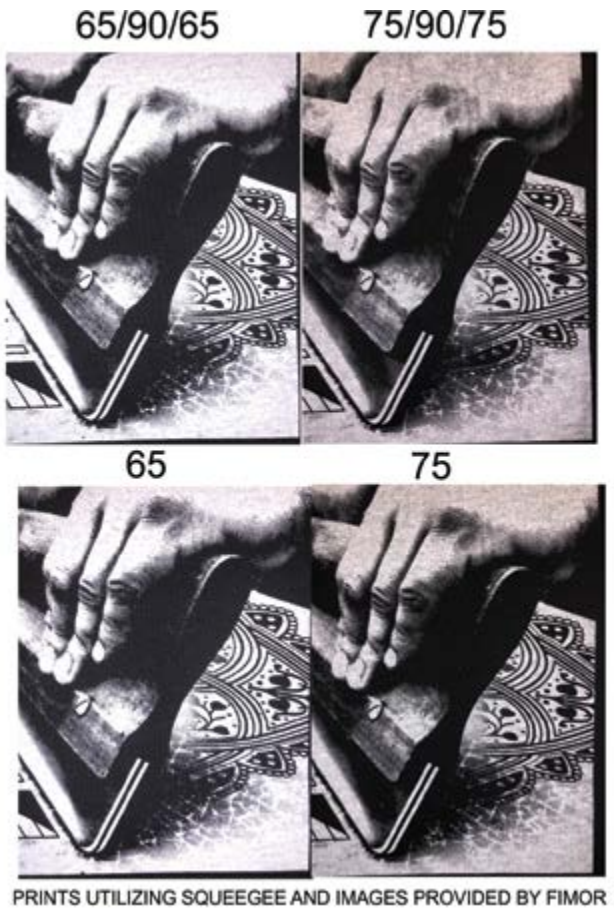


Different blade edges

Three (technically four) types of squeegee

Garment Type	Color	Ink Type	Squeegee Hardness
Jersey	Light	Plastisol	75/90/75, 70, 75
Jersey	Dark	Plastisol	55/90/55, 65/90/65, 70
Jersey	Any	Water Base	55/90/55, 65/90/65, 70
Fleece	Any	Plastisol	55/90/55, 65/90/65, 70
Nylon	Any	Nylon	75/90/75, 75
Cotton	Dark	Discharge	55/90/55, 65/90/65, 70
		High Density	55/90/55, 65/90/65, 70
		Gel	55/90/55, 65/90/65, 70

Example of a squeegee selection chart



Durometer-printed work

Most angles will fall between 10–15 degrees; however, adjustments will need to be made depending on whether you require a thinner (lower angle) or thicker (higher angle) deposit, based on garment type, mesh and ink type. Recording angles on your production sheets will save time and frustration when setting up the next time.

PRESSURE

Stop trying to print the floor. The purpose of the squeegee blade is to shear ink on the garment with the best adhesion but softest hand possible. Excessive pressure is one of the most used 'fixes' when another problem has occurred on press. While this might be the fastest and 'easiest' fix, it can cause unneeded wear to your press, poor imaging and screen breakdown just to name a few.

CARE AND MAINTENANCE

Storing your squeegees flat will assist in prolonging longevity. Squeegee rubber should 'rest' approximately 12–24 hours after receiving and after each cleaning before being used again.

Squeegee edges can AND SHOULD be sharpened as soon as the edge starts to show wear. Investing in a sharpener is one of the smartest, faster ROI-showing pieces of equipment you can purchase. When sharpening, you want to remove as little material as possible while providing sharp edges without melting the material. This will create an immediate cost savings and printing improvement. ■

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THE HEAT IS ON

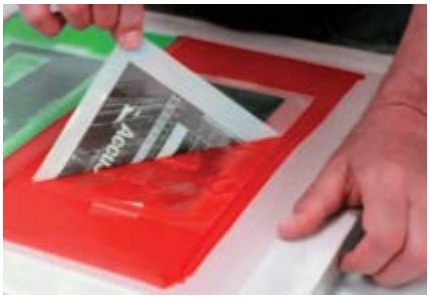
Mick Orr explains how to handle humidity when making and printing screens during hot and steamy weather

Ikonics' Training Specialist, Mick Orr

Well, that time of year has its grip on us again. Hot and steamy weather is great for vacations but bad news for screen making and printing. Probably the best place to make screens is in a climate that is typically cold and dry... like Duluth [in north-east America]. I'm kidding about the weather we have in Duluth. We do have a beautiful summer, it's just a little short. Hopefully, it will land on a weekend so that I don't miss it this time.

Humidity is truly a major headache for many screen printing companies. I have seen companies that have shut down for the day because the screens were falling off the mesh or sticking to the glass of the exposure unit so tightly that it would ruin the stencil and the positive. The stencil is not the problem, it's the humidity. Even when humidity isn't very high, it may still give you problems. Have you ever noticed that you have fewer problems in the winter than in the summer? I have. Monitor the humidity in your shop for a year. You will see that fewer problems happen when the humidity is low.

A drying cabinet will help combat a humidity problem



Sticking photopositives will cause major issues

HUMIDITY PROBLEMS

Some of the problems associated with high humidity are: weak stencils, pinholing, sticking

Temperature and humidity will affect how the ink dries on the ink jet film

50–70% relative humidity is recommended

photopositives, lengthened drying, and poor imaging. Because they are designed to be processed with water, emulsions and films are sensitive to any moisture. This moisture can and will be sucked out of the air by the coated screen just as if it were a sponge soaking up spilled milk. Not only will the stencil absorb moisture, it will swell. Swelling will lead to delamination and poor image quality.

As well as moisture being absorbed by the polymers of the emulsion, it can also affect the sensitiser. If the screen is exposed to ultraviolet light while retaining moisture, the sensitiser will cross-link with the polymers and the water present in the emulsion. The problem comes when the sensitiser cross-links with the water. The stencil is not the problem, it's the humidity. Even when humidity isn't very high, it may still give you problems. Remember, the more cross-linking between the polymers, the more durable the stencil will be against abrasion and longevity. Image quality will also be improved.

One other issue with high humidity is the positives made by inkjet printers. Temperature and humidity will affect how the ink dries on the ink jet film. If you notice that the ink isn't drying like it used to, even if you didn't change a thing, it is probably the humidity causing the positive not to dry.

I have witnessed this phenomenon. One day the positives were coming off the printer dry to the touch. The next day they were coming off the printer almost dripping wet. The first day was dry (45% relative humidity) the second day it was raining. The relative humidity in the room where the positives were being made was over 80%. The culprit was the level of humidity. Try to keep the humidity below 50%

I like to tell customer that if they are hot and sweaty and uncomfortable in the shop, bets are that they will experience the wrath of humidity.

SOLUTIONS

So how can you solve many of your printing problems without moving to Duluth? A drying cabinet will help combat a humidity problem, but only partially. When the screen is dried in the cabinet it will only be dry in the cabinet. The moment it is taken out of the cabinet it will begin to draw moisture from the environment. The wetter the air, the wetter the screen becomes. Keep the humidity low and the same throughout the shop and you will have fewer problems with your stencils. We recommend 50–70% relative humidity.

Control your shop conditions from screen making to screen printing. Both the screen making room and the screen printing area should be climate controlled. Keep everything as consistent as possible. ■

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The wetter the air, the wetter the screen becomes

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ROUND THE TWIST

Benjamin Adner takes a deeper dive into direct-to-object cylindrical printing

Direct-to-object printing on cylindrical items is a comparatively new application that is opening up a range of creative possibilities. Digital printing techniques (enhanced by specialty inks and advanced print heads) have been integrated with automated workflows to deliver impressive, repeatable quality at more cost-effective price points. The result is expanding business opportunities for printers and new branding and promotional uses for customers.

First, a definition: Direct-to-object (DTO) cylindrical printing is when a machine directly lays ink onto a curved surface that usually is the wall of an object that has a circular cross section, and a constant, tapered, or variable diameter. Printing on cylindrical objects can be achieved using pad, screen or digital techniques.

Pad printing is suitable when the job calls for one or two colours over a limited (non-wraparound) area, typically less than 25% of the surface. Screen printing can reproduce multi-colour graphics spanning 360 degrees of surface area. Screen printing has the advantage of widely installed equipment and a well-practised technique, but is disadvantaged in labour time, material costs and additional production steps. As today's cylindrical jobs call for added colours and creative imaging options, screen printing is being supplanted by more efficient and capable digital systems.

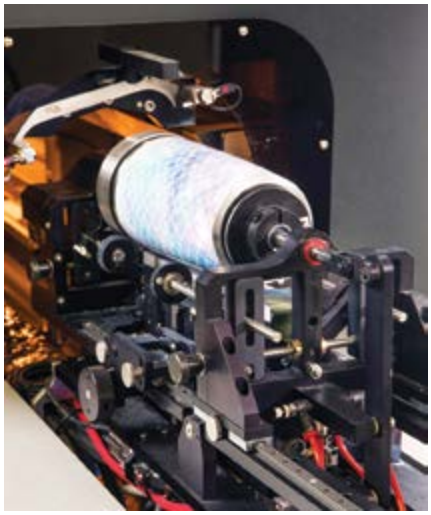
DTO digital offers three main advantages over screen printing:

1) Producing multiple colours and/or full-wrap design effects in one pass
2) Ability to do short runs with customisation
3) Significant time and cost savings

Taken together, these strengths make for a compelling case. For this article, we will focus on the newer digital method.

ABUNDANCE OF APPLICATIONS

While digital printing on flat objects has been a standard industry practice for years, users



Inkcups' Helix rotary inkjet printer can print onto straight-walled and tapered cylinders

Glasses personalised with photo-realistic images using Inkcups' printers

can now digitally print on an expansive range of cylindrical items. It's important to note, however, that many machines on the market restrict what type of cylinder the printer can handle. Some key considerations are printable diameter, length of the object, angle of a taper and depth of the largest contour. In addition to machine limitations, users should also take into account the composition of the item, as certain inks can properly adhere only to specific substrates.

Among the many cylindrical items that can now be digitally printed are glasses and barware; stainless steel tumblers and plastic sport bottles; candles and candle holders; industrial tubes; disposable cups; beer cans and spirit bottles; measuring cups; event-based products (i.e. water bottles for races); personalised items and cosmetics. In addition, this method can print on a variety of materials including glass, coated metals, stainless steel, a variety of plastics and paraffin wax (candles).

Glass objects are becoming increasingly popular. To ensure a successful result, items must first be flame-treated to remove impurities and any coatings and debris from the surface, then treated with primer – for example, Inkcups' Magicoat pre-treatment solutions – to allow the ink to properly adhere. Other trending DTO-printed cylindrical items are Tritan plastic (e.g. sports bottles and storage containers) and bicycle bottles – especially 'extreme squeeze' types, which must retain their artwork through hundreds of uses. Inkcups' digital inks are highly durable and abrasion-resistant (up to 500 washes for glassware) and meet ASTM standards for adhesion.

COLOUR AND DESIGN VARIETY

The ability of DTO digital machines to print full colour including varnishes and specialty inks, enables a wide variety of design techniques. These include:

- Mirror prints – colour images viewable on inside and outside of glass or plastic
- Tone on tone – solid matte-finished substrate enhanced with one ink or clear coat
- Stained glass – colour translucent enough to see through
- Relief effects where all or parts of the image are layered to be felt by the user
- Simulated frost/etching imagery

Full-wrap cylindrical printing also demands seamless borders with no visual 'lap mark.' For added flexibility and ease of file preparation, original graphic artwork should be able to be imaged on cylinders and tapers without the need for manipulation or distortion; i.e., flat images will print to scale on a curved surface, with software automatically making the adjustment. The best machines on the market will easily handle these requirements.

Full-colour DTO digital is by definition a faster process than screen printing, thanks to fewer production steps. There's less setup time for multiple colours and more complex jobs, which enables reduced run lengths. This means that users can better manage inventory by producing smaller, on-demand runs, as well as respond to time-sensitive demands, such as quick-turnaround jobs tied to sports competitions, events or celebrations. This not only reduces product lead times but reduces the decorator's inventory carrying costs and scrap rates significantly.

WHAT TO LOOK FOR

When shopping for a DTO digital printing solution for cylindrical applications, consider the types of objects and materials you'll be printing on, as well as the range of colours and design techniques you might encounter. Not all pre-treatment methods and inks are created equal, so be sure to evaluate quality and durability on different items (asking for test samples is always a good idea!). Make sure your equipment supplier understands the unique needs of your market and can provide testing, application guidance, direct sales support, and expert technical support.

With these considerations in mind – and the right partner for hardware, consumables and service – you'll be ready to dive into new market opportunities. ■

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JUST FOR YOU

A customised inkjet printer could be the best option for your company, suggests Jan Baden

Jan Baden, CEO and Founder of Druckprozess

Colour calibration of a textile, printed with reactive dyes

When choosing the right inkjet printer for any application, many things have to be considered. Which ink technology will fit the requirements, which printhead technology will get the expected result, how many different colours have to be used, what will be the best media transportation system and how to get the ink dry?

Most available inkjet printers come as they are. The only choice customers have is to choose the amount of different colours, and printing speed may suffer due to the amount of printheads.

An advantage of inkjet technology is its ability to facilitate the change from a push-market into a pull-market strategy – i.e. instead of producing large amounts of stock to sell afterwards, the manufacturer starts its production with the sale of the product. This is a strategy many inkjet printer manufacturers recommend to their clients, because such on-demand production gives the best flexibility when using the inkjet printing technology.

MODULAR PRINTING SYSTEM

Druckprozess has developed its 'aQ-printer', a modular printing system which can be customised for the user's application. First, demands and requirements of the printed product are evaluated to identify the corresponding ink and printhead technology. Due to a unique printhead layout, the number of colours and printheads is flexible. In terms of printing speed, an optional second row of printheads can double the output. Depending on the type of media, the transportation system of the printer could be flatbed, roll-to-roll with pinch-rollers, rubber-rollers or a belt. Further optional equipment like an expander roller, UV or NIR [Near Infrared] dryer and jumbo re- and un-winder are also available.

This modular system concept is particularly beneficial to industrial customers who require:

- Flexibility – due to the ability to customise the printer for customer needs and to add further options later
- Stability – due to industrial components (servos and drives from Panasonic, heads from Ricoh or Kyocera)
- Simplicity – in construction, operation and maintenance
- Robustness – full metal frame and covers
- Productivity – full printing speed independent of colour setup
- RIP from Ergosoft or Caldera
- Durability of the printing result – due to multiple ink technologies roofed under 'aQvarius inks'
- Seamless colour integration – in existing print environment and production
- Investment security – service agreement for 36 month incl. printheads available*

Each printing system is produced on-demand and the production starts with the sale. Druckprozess is not only recommending the pull-market-strategy – it is its USP and DNA. ■

**Service agreements including printheads are available for European customers only*

Jan Baden is CEO of Druckprozess

Druckprozess's water-based flatbed printer aQ 1212-R with a NIR-dryer

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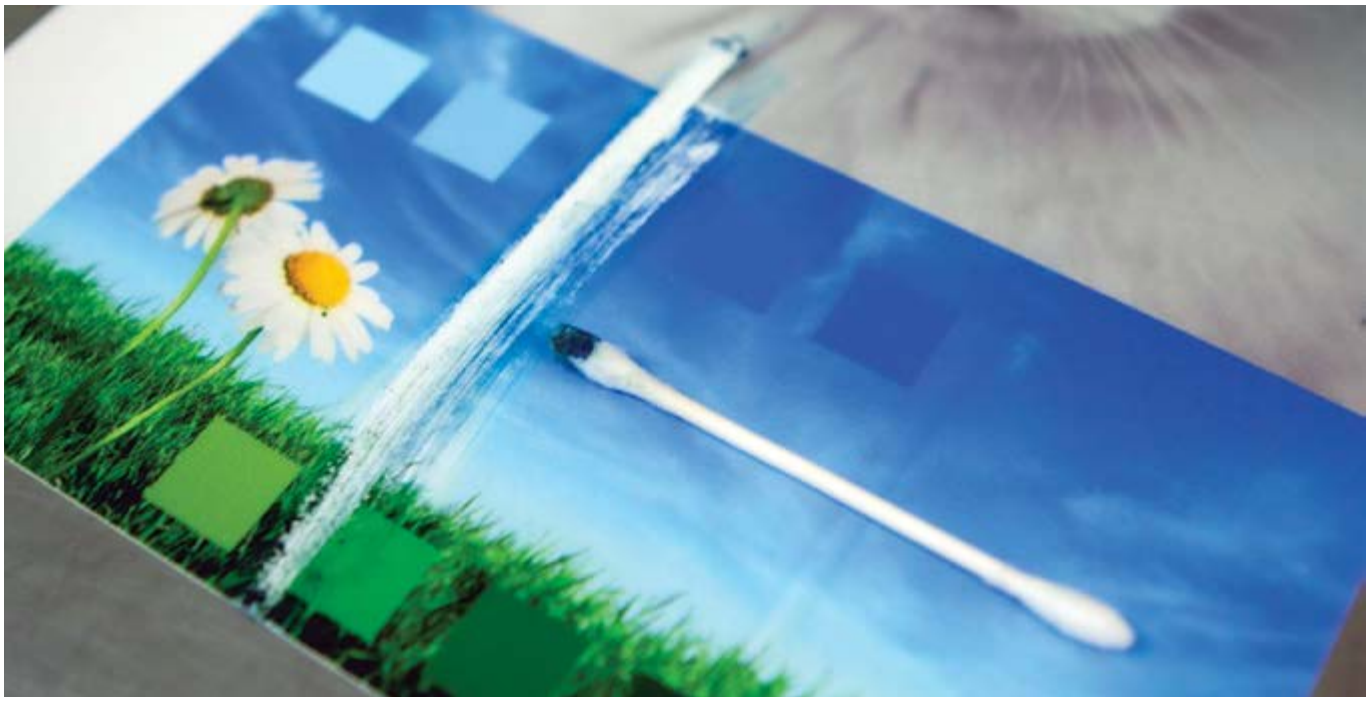


An ink that feels dry may not necessarily be fully-cured

FULLY CURED

Terry Kimrey and Laura Patriquin discuss the differences between cured and dried ink

You're rushing to get that new print order done for a crucial customer. You've run the ink; you have all the prints ready to go. As soon as the 10,000th print comes off the line, you quickly run one final rub test to ensure that they will adequately resist the chemical solvent they'll be coming into contact with as a part of end-use.

Panic sets in – the ink comes off. Previous testing showed the ink to have good chemical resistance, so what happened? Did the ink go bad? Are all these prints wasted now?

AN IMPORTANT DISTINCTION

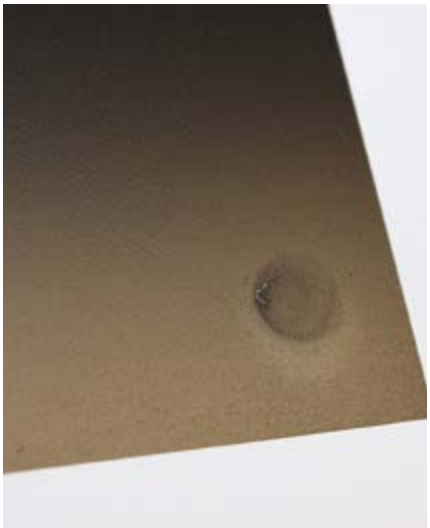
Dried and cured: many people think that these terms mean the same thing, while others believe that the sole delineation is based on ink chemistry, i.e. solvent or UV-curing. While the two are certainly related, there is more to the story of cured versus dried ink films.

When an ink is printed either by screen, inkjet, roll-coater or other methods, the initial point where the ink becomes hard and does not mar when touched is when it is considered dried. This is true of all ink chemistry types (solvent, water-based, UV, etc). Where some confusion comes in is when discussing UV or UV-LED ink. Because a chemical reaction takes place in the ink when exposed to ultraviolet light, this process is known as 'curing' the ink. As we'll review, though, this initial curing process does not mean that the ink is immediately fully cured.

SOLVENT AND WATER-BASED INKS

Solvent and water-based inks typically dry by evaporation – the solvent or water evaporates

Continued over



No matter the chemistry of the ink used (solvent, UV, etc.), a thumb twist test should be performed after printing to check for adequate dryness or initial cure of the ink

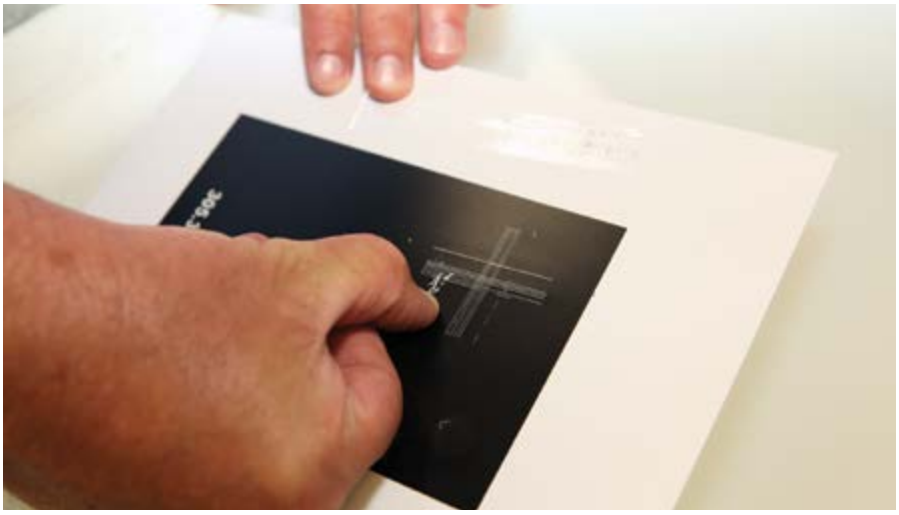
out of the ink, leaving a dried ink film. The dried ink film will be non-tacky to the touch and resist marring. A common test for dryness is the thumb twist: a thumb is placed on the ink film and twisted with medium pressure. If ink does not displace, it is an indication that the film is dry.

In some cases, however, the drying process is only the start of the finished ink film. While a film may initially be dry-to-the-touch, inks in which a chemical reaction takes place over time are known as reactive inks. This longer-term hardening of the ink is sometimes referred to as the curing stage – though the terminology is similar, this is different than the curing referred to when UV ink is exposed to ultraviolet light.

UV AND UV-LED INKS

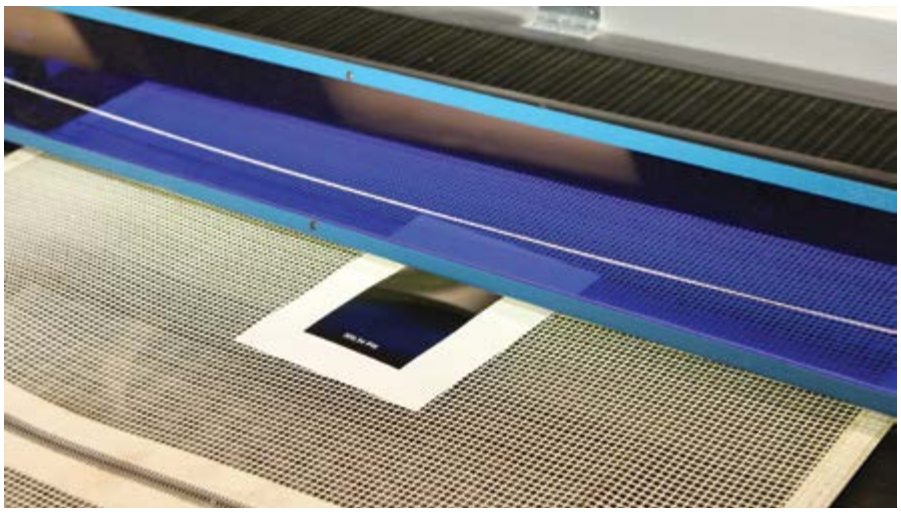
Instead of evaporation, UV and UV-LED inks become dry due to a chemical reaction in the ink. When the print is passed under ultraviolet light, molecules in the ink – known as photoinitiators – start a reaction that causes other molecules – monomers and oligomers – to 'grab onto' one another and produce a dry-to-the-touch ink film after the print exits the unit and cools down. As with solvent or water-based inks, the thumb twist test should be performed on prints created with UV inks to determine if the ink is curing properly.

While a UV ink may be dry-to-the-touch, complete curing is critical to a UV ink's performance – this can be a process that occurs over a period of time after initial curing. Inks will often not perform correctly until they are fully cured. Take our example at the beginning of this article – ink that needs to resist a chemical solvent, ensuring that the printed graphic will not erode upon coming into contact with it. As in this case, an initially-cured UV ink may fail a resistance test, while a fully cured ink is much more likely to pass.



Initially-cured inks often do not perform to their full capability, potentially failing tests such as adhesion or chemical resistance

Determining when an ink is fully cured can be tricky. While ink manufacturers usually provide a general recommendation, a wide range of factors can affect cure time. These factors can include environment, processing, equipment, and additives used in the ink. Heating a print may reduce cure time but risks making the ink brittle, while additives such as thinners, catalyst, and adhesion promoters can increase cure time. As a printer, all these factors must be considered in determining when a print is ready to perform to its maximum capability.



UV inks become dry-to-the-touch through a process known as curing, in which UV light reacts with molecules in the ink. However, prints exiting the reactor are not yet fully-cured

RECAP

So, when is it correct to use the terms dried or cured? Dry-to-the-touch, solvent and water-based inks can generally be considered 'dried.' However, although UV and UV-LED inks exit the reactor dry-to-the-touch as well, using the term 'cured' is a more accurate description. It may also be helpful to include a qualifier, such as initially cured, as the dry ink may still be undergoing chemical reactions; it is not until the ink is fully cured that it is able to perform to its best capability.

In our original example, the prints may have only needed more time – once fully cured, the ink would perform as intended with all its chemical-resistant properties, leaving you with a happy customer (and considerably less panic for you, as a printer). Simply put, an ink that feels dry may not necessarily be fully cured, and understanding the distinction between the two is essential to maximising the performance of your ink and your entire print process. ■

Terry Kimrey is Market Segment Manager – Graphic Screen, and Laura Patriquin is a Marketing Specialist at Nazdar

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BETWEEN THE LINES

Mark Priest presents a solution to the challenge of 'zero clearance' printing

The rising number of industrial applications supported by screen printing has brought accuracy, precision and repeatability to play a priority role in research and development of production technologies. Increasing demand for precision printing, driven by some specific industrial applications, such as advanced electronics, pushes to continually raise the bar.

The distinctive trait of screen printing is the ink film thickness that is deposited on the surface of the object to be printed. Unlike other technologies, screen printing can deposit an ink film thickness ranging from tens to hundreds of microns. This gives the ink high masking capabilities, allowing, for example, bold white printing onto black paper. Furthermore, given that the shape of the object to be printed no longer represents a constraint for screen printing, the process is currently used in a wide range of applications, including printing for food packaging, clothing, car instrumentation control panels, electronic cards, greetings cards, tags, scratch cards, Braille prints and decorations on curved, vertical surfaces or even special shapes and moulds.

PRECISION CHALLENGES

The development of screen printing technology today is mainly powered by advanced rather than decorative electronic applications. The ever smaller dimensions of printed [circuit] lines in parallel with the increasingly high performance of electronic devices, have generated a growing demand for precision in screen printing technologies. Print output is becoming more and more precise, with a print pattern width from

The printed lines which form part of an electric circuit. They are greatly magnified and show just how precise the printing needs to be

10–30 microns and with a tolerance between ± 2 and 3 microns.

Generally classified as 'out-of-contact printing', screen printing provides a space (clearance) between the object to be printed and the fabric (mesh) of the printing frame. This space is an aspect that operators take into consideration as an integral part of the screen printing process. However, this gap causes the holes of the mesh to 'squeeze' slightly, generating a distortion of the print and consequently a reduction in the precision rate.

One way to overcome this problem is to calculate the degree of print distortion based on distance and create a screen with predistortion compensation. However, this procedure does not substantially increase precision.

ZERO CLEARANCE

Sakurai believes that the key to real printing accuracy is to reduce the out-of-contact gap by pushing it as close as possible to zero. (Sakurai's 'Zero Clearance' technology is still

A more magnified view of two fine lines of printed electrical circuit

a registered patent today.)

With traditional flatbed screen printing machines where the screen, the object to be printed and the printing plane can be in contact, the printed object must be removed from the screen to avoid blurring or smearing. This obviously makes it impossible to reduce the space to zero. It is also true that, to avoid smudging or blurring, compact flatbed printing machines use 'contact printing' techniques with metal masks for industrial applications.

In the case of screen printing machines that use a printing cylinder, where the fabric of the frame and the printed object come into contact along a single line at a given time, the printed object is unloaded immediately after printing, eliminating the need for a separation mechanism. However, the procedure must have a gap [to release] the 'claws' used for gripping and moving the object as it is printed.

NEW SYSTEM

Focusing on this aspect, Sakurai has developed a new system for 'zero clearance'

A Sakurai press with dryer and stacker

printing, based on the MS-102SD cylinder printing machine, using independent servo-motors. The MS-102SD allows independent movement of the frame and the cylinder, enabling sections of the job to print at different speeds from front to back, which reduces or increases the print length. In fact, it is possible to alter the print length up to five times in different sections of the job from the front to the back of the sheet, enabling precise fit and ensuring optimum accuracy.

The technology has not only made it possible to reach 'zero clearance' of the printing process, the independent motors also allow a constant squeegee speed – previously considered impossible with cylinder printing.

The ability to raise and lower the screen independently of the timing of the cylinder speed also assists precision and repeatability. The new technology has enabled a contact quality that was previously unreachable with cylinder printing machines and offers high printing speeds compared to printing techniques with metal masks used for high precision flat printing applications.

The ability to print on green sheets and capacitors has opened new markets for the printing of electronic components, requiring ever greater precision and productivity. Sakurai's mission is to create and implement technologies that meet these needs. Sakurai R&D continues to improve its products and develop new functionalities by applying the targets achieved in a given sector to all possible screen printing applications. These new functionalities added to automated squeegee pressure setting and the minute cylinder tolerances that Sakurai uses when manufacturing, result in presses that produce reliable, repeatable and accurate printing conditions – perfect for group-wide applications where production is made in different countries. ■

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CTS GUIDE

Mark W Evans advises on everything you need to know when moving to a CtS/DtS workflow

Imagine this scenario... You are a designer in a busy T-shirt printing operation and your boss just informed you that they have purchased a Computer to Screen system to speed up screen production and improve image stencil quality. What does this mean for you?

This is a situation that many art room personnel have encountered with the rise in popularity of computer to screen. At first glance there is nothing to worry about. You will still need to prepare the artwork designs and colour separations as normal... The only difference is that now you will print directly onto the screen emulsion instead of outputting film positives.

But… by its very nature using CtS means that image positioning on a screen is now being performed digitally rather than mechanically. There is no longer any film to be positioned and taped on to the screen. This process is now electronic and it is an integral part of the new pre-press digital workflow.

A similar issue faced lithographic printers when they replaced using film with computer to plate. Commercial lithographic printers use Imposition software to position pages and artwork onto press sheets. Similarly, with computer to screen the artwork has to be electronically positioned on the coated screen, in the correct position. How will that be accomplished and who should take responsibility for this process?

Another big change is that the CtS system needs to be in a UV light safe environment, typically inside the screen room... whereas a film output device would normally be located in the art room

So what does this mean for the pre-press workflow? What job responsibilities change and how? Computer to screen system is a labour-saving device... but how exactly are these savings achieved?

EMBRACING THE CHANGE

If your company is already using a Direct to Garment system then you probably have some familiarity with how the process will change. With DTG printing the artwork placement is usually controlled by software templates that have pre-defined sizes and positions. So one template might be a front chest T-shirt print and another might be a left (or right) breast pocket print. Additional templates may also be required for different size shirts: baby/toddler, child and adult, etc.

Working with software templates may seem like additional steps for the Design department, But it really does save time. In fact the auto registration of colour separations that comes with CtS means that you can make full use of design applications and/or your RIP software's ability to auto-separate jobs. Often, when using film positives, colour separations are performed manually by the designer to save on film output wastage. But once you are using CtS this is no longer necessary. If your workflow is set up correctly

Continued on page 26

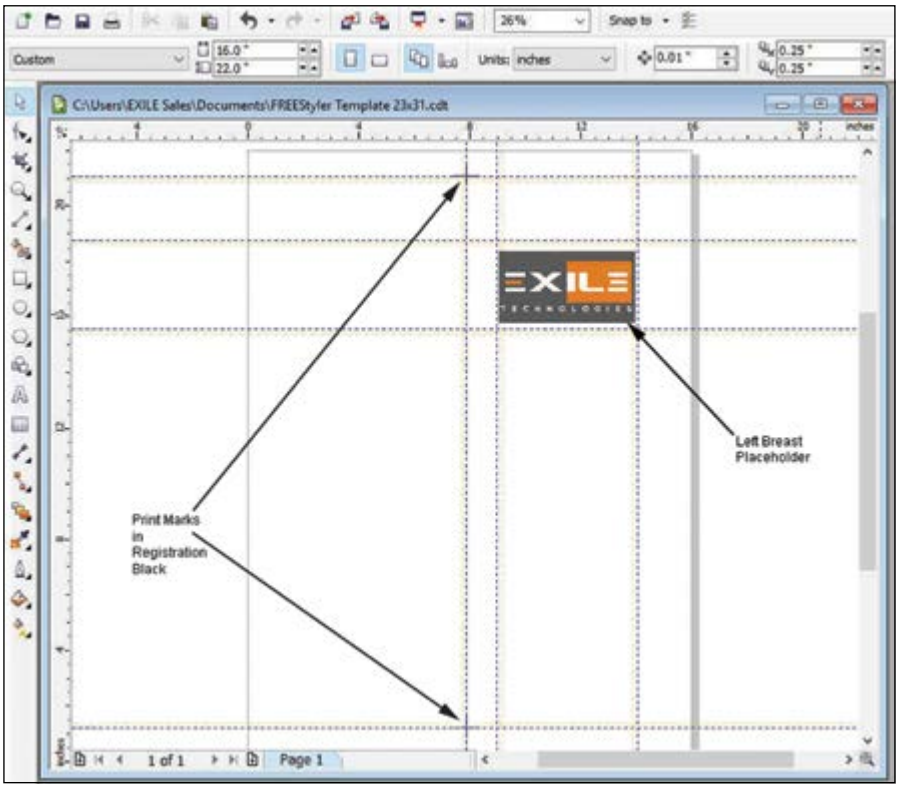

Fig.1: Corel 23x31" T-shirt template

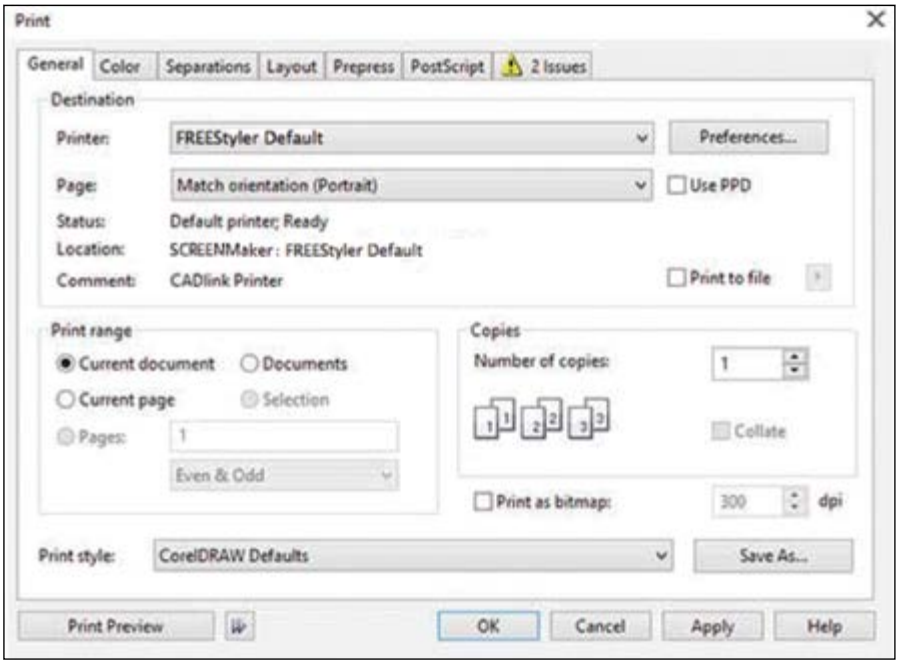

Fig. 2: Printer interface from CorelDraw

gallus

Gallus Screeny for flatbed screen printing

Simplicity for productivity. The Gallus Screeny G-Line & C-Line is setting new standards in cost-effectiveness, quality and production reliability for decorating hollow glass and containers using industrial screen printing.

Screen Printing Plates (Screeny G-Line & C-Line) **1**

2 CtS (Heidelberg Phoenix)

Gallus System Solution

Custom made fast tension frames **4**

3 Wash out Solution

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"The presentations as well as the exhibition were very useful to learn about new technologies and products in the glass printing industry." **Schott**

"Small but very interesting conference, as most of the actors of glass decoration are present." **Saint-Gobain**

"A very interesting conference allowing for a great deal of networking. Really good presentations that covered a wide range of topics…" **Allied Glass**

"GlassPrint was an interesting event." **NSG Pilkington**

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	TIME	PRESENTATION	PRESENTER
DAY 1 (27 NOVEMBER)	10:00	Arrival, registration and table top exhibition	
	11:00	Introduction and welcome.	Chameleon / ESMA
	11:15	KEYNOTE PRESENTATION	FEVE
	11:45	Digital printing on hollow glass	Fermac
	12:15	Screen print 2.0 from plastic dial to digital glass display	Marabu
	12:45	Lunch and table top exhibition	
	14:00	Inkjet coating and decoration of flat, container and industrial glass	Global Inkjet Systems
	14:30	Adding value for hollow glass decoration	Ferro
	15:00	Adhesion of inkjet inks on glass	ChemStream
	15:30	Coffee break and table top exhibition	
	16:00	Simplifying glass printing with screen and CtS technology	Grünig/SignTronic
	16:30	Direct-to-cylinder: Digital printing on glassware	InkCups
	17:00	KEYNOTE PRESENTATION: German Glass Industry – Situation and Trends. KEYNOTE PRESENTATION: glasstec 2020 – current status and future outlook.	BV Glas (Bundesverband Glasindustrie) glasstec / Messe Düsseldorf
	18:00	Table top exhibition	
	19:00	Networking buffet dinner and table top exhibition	
	21:00	Close	
DAY 2 (28 NOVEMBER)	08:00	Table top exhibition	
	08:55	Welcome to day two	Chameleon / ESMA
	09:00	KEYNOTE PRESENTATION	Glass for Europe
	09:30	Surface pre-treatment to enhance adhesion and coverage of organic inks to hollow glass	Tecno5, an affiliate of Cerve
	10:00	High performance CTP system for digital preparation of silk screen forms and pad printing plates	Lüscher
	10:30	Coffee break and table top exhibition	
	11:00	Developing dedicated mesh for screenprinting on glass	Sefar
	11:30	Will it be screen or digital printing on glass bottles?	Curvink
	12:00	Industrial solution for digital printing of windshields and sidelights	THIEME
	12:30	Lunch and table top exhibition	
	13:30	Making a lasting impression: Ink adhesion to glass	Oliver Kammann, ESMA Expert
	14:00	Automation and control for screen printing on small size flat glass	SPS Technoscreen
	14:30	Labels are out! Ink challenges and opportunities in direct to container glass inkjet printing	Marabu
	15:00	Sol-gel inkjet printing for transparent conductors on glass	COMATEC-LANS
	15:30	Table top exhibtion	
	16:30	Close	

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you should be able to place your artwork in predefined illustrator or CorelDraw templates and hit the 'print' button. The application and RIP software should take care of the rest.

TYPICAL CTS PRE PRESS WORKFLOW

In this example we are using CorelDraw to make our T-shirt designs and we have a simple two-colour pocket logo that needs to be output. For correct positioning of a pocket print we need to make sure the artwork is positioned correctly on our output template. We start by opening our CtS CorelDraw template; in this case it is set up for a 23x31ins screen frame. The actual image area on the Corel template is 16 inches wide by 22 inches high, which is determined by the screen frame size and the width of the squeegee and the stroke length of the printing press. So a 16ins wide squeegee dictates a 16ins wide image template.

This template has predefined guidelines for different artwork positions on the shirt. It has positional guides defined for the left breast pocket, where we have placed the logo artwork, as well as guides defining the top and bottom printing margins. Registration marks have been pre-set to define top and bottom centre positions for aligning the screen on the press. These crosshairs have been created using registration black so that they will appear on any colour separation produced from this template (see **Fig 1**).

Once the template is open, the artwork can be dropped into the desired template 'place- holder' location and scaled to the correct size to fit the 'pocket' template holder.

Additional guides for a right breast pocket print and other standard print positions such as chest, upper back or sleeve prints can also be defined on the same template thereby giving the designer a quick method for pasting and scaling existing artwork.

The next step is to save the new design with a unique job name. This is an important step as the job file name is used by the RIP software to name the output files that are then sent to the CtS system.

If multi-colour jobs are pre-separated when being sent to the RIP then the job name will be automatically appended with the colour separation names which allows the CtS operator in the Screen room to identify which job and colour separation is next in line for output.

This CorelDraw example is typical of the type of template that designers use for artwork preparation with a CtS system. For Adobe users, Adobe Illustrator running on either Windows or Mac OS can be used to produce a similar type of template to this CorelDraw example.

Once the design is finalised and saved it can be sent to the RIP. The best way to do this is to use the 'Print' option using a PostScript compatible print driver. These are standard options on Windows and Mac operating systems and this is where the job can be automatically separated into spot colours or CMYK four-colour process, or both. Generating a pre-separated PostScript file from CorelDraw is achieved by using the 'Print' dialogue menu (see **Fig. 2**).

So long as the printer selected is a PostScript device, an extra tab will appear in the Print options labelled 'PostScript'. To ensure that the resulting PostScript is pre-separated for the RIP, select the 'Colour' tab and select 'Print separations'. This will ensure that the resulting PostScript file is automatically pre-separated with a separate page for each colour (see **Fig. 3**).

The actual colour separations that are produced can be previewed in the Separations dialogue where individual colours can be selected for output. In this case the EXILE logo pocket print is made up of two spot colours Orange and Grey.

A check box against each colour can be highlighted to select it for output and at this

Continued over

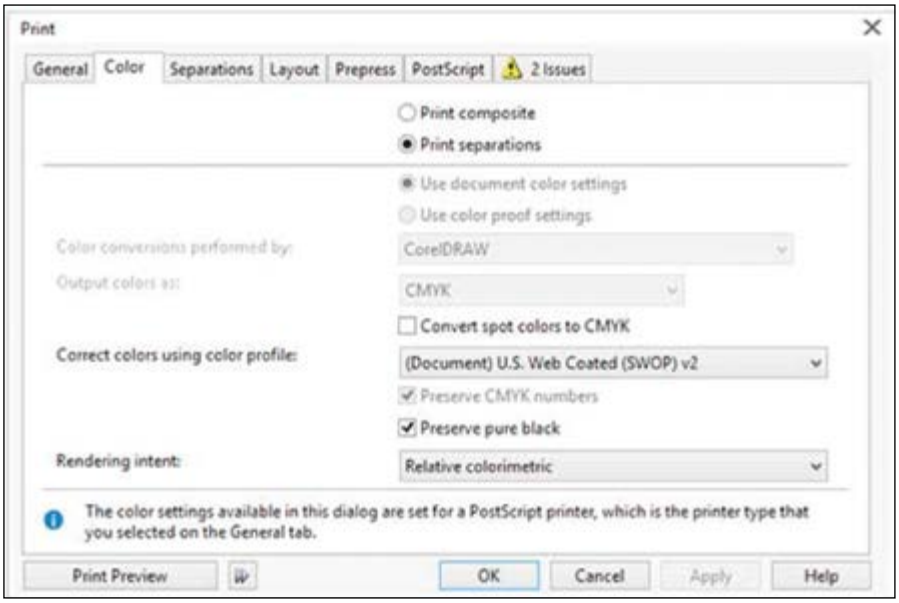

Fig. 3: Selecting colour separations from CorelDraw

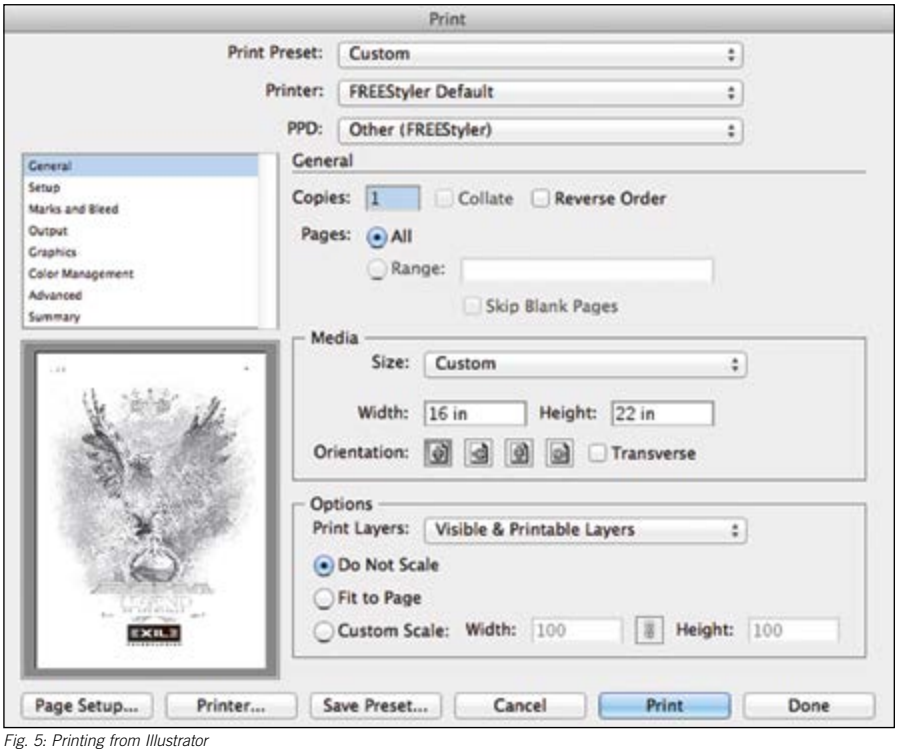

Fig. 5: Printing from Illustrator

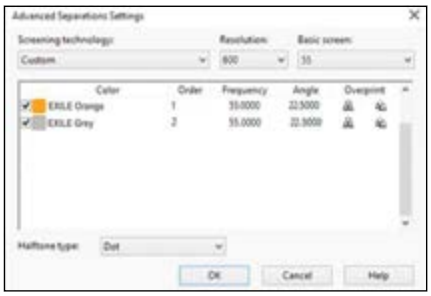

Fig. 4: Previewing and selecting separations to print

point Screen rulings and angles can also be specified if required (see **Fig. 4**).

The CorelDraw file can be printed either directly to the RIP or saved as a PostScript or PDF file.

CUSTOM SIZE

In this next example we are using an Adobe Illustrator template set up with the same dimensions as the previous CorelDraw example. The Illustrator print dialogue shows the use of selecting the 'Custom' page size, which will automatically size the output to be the same as the original document template.

It is important to understand that the document size used for the artwork and the PostScript print size are not always the same. Using 'Custom' ensures that the artwork document size is used (see **Fig. 5**).

This is very important for a CtS workflow as changing the PostScript output page size, or 'Bounding box' will change the final artwork position when it is printed on the screen. Standardisation and consistency is very important here which is why pre-defined templates are used.

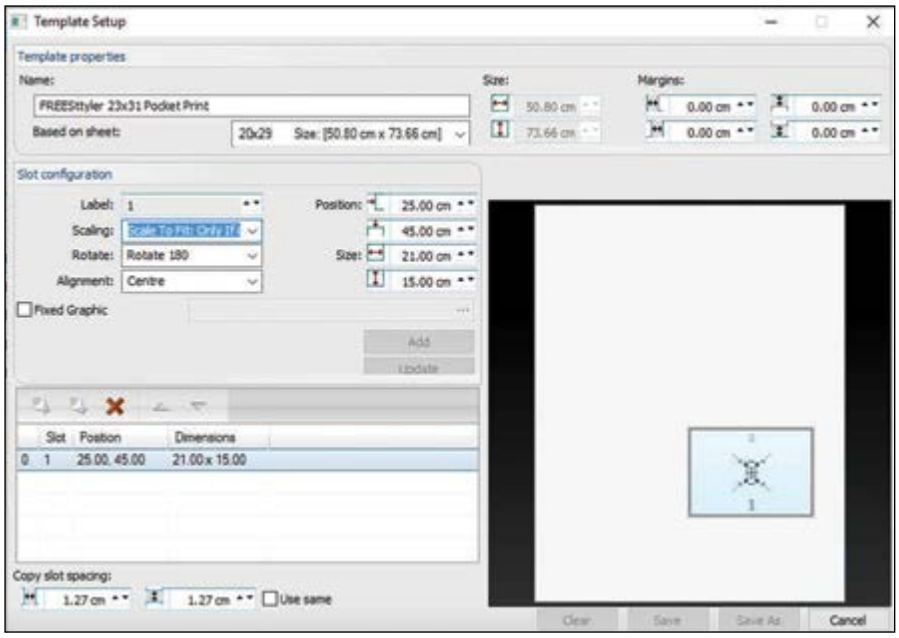

Fig. 6: Example of 'in RIP' templating

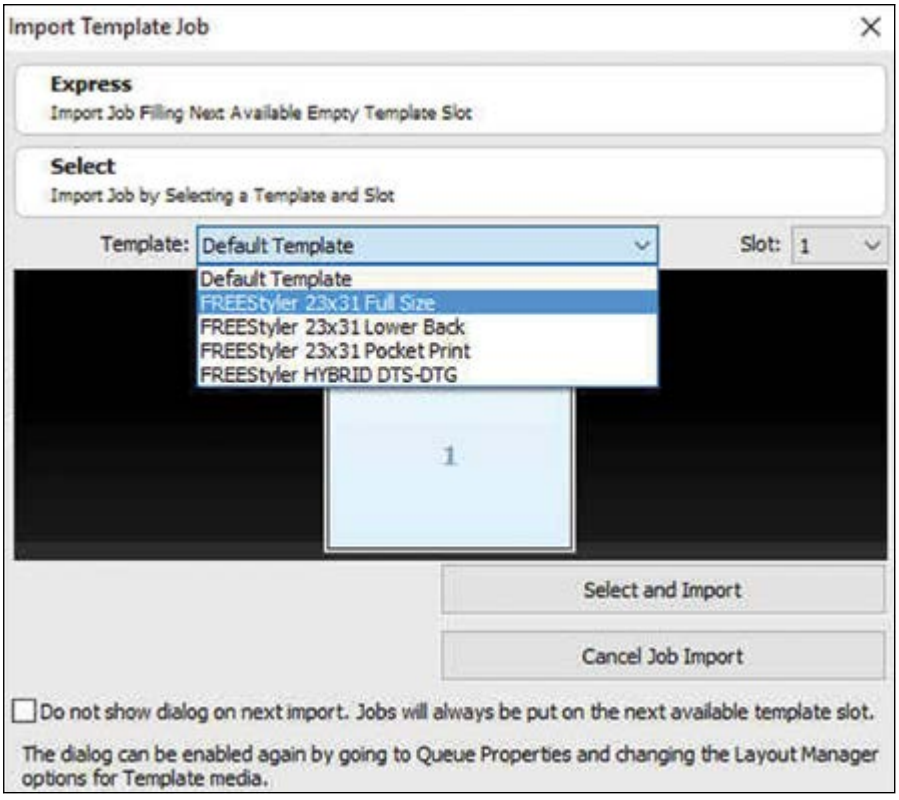

Fig. 7: Predefined template placeholders

PLACEMENT WITHIN RIP

An alternative to using templates and placeholders in your design application is to perform the artwork placement or 'imposition' within the RIP software itself. Not all PostScript RIP solutions offer this option. But some do and this can be a way of moving this element of the CtS workflow back into the Screen room.

In this next example we are using Exile's ScreenMaker RIP connected to a FREEStyler CtS system to set up predefined artwork placeholders for a 23" x 31" Screen (see **Fig. 6**).

The example shows a left breast pocket print (the screen is shown up-side-down). The software allows the image to be automatically rotated and mirrored if required. The artwork can also be automatically scaled to fit the placeholder if it is too large.

When a job is received by screen maker, the user is prompted to select a template placeholder. There may be several of these pre-defined for different types of print job as per the following example where the artwork is automatically placed in one of several template options (see **Fig. 7**).

These options allow the screen room operator to position the artwork digitally using computer software to emulate how they would have previously physically taped the film positives in place manually on the screen.

With a film output device, the RIP processes the job and then outputs the Ripped file(s) direct to the printer or imagesetter. The RIP may have media saving features to save on film wastage: such as rotating a job or step and repeating film separations across the film width.

With a CtS workflow these options must be switched off. Instead, the RIP will process each colour separation in turn and then outputs the result to a special print file. Typically this will be a 1-bit TIFF file or a similar format.

The advantage of using 1-bit TIFFs as the output format is that these can be easily viewed and checked – think of them as the digital equivalent of a film positive that can be archived for re-used any time a job needs to be repeated or if a screen needs to be re-made.

It may seem a bit daunting but with good preparation the changes needed in the pre-press workflow will help ensure that your new CtS installation goes smoothly and will shorten the implementation period. Not to mention significant labour savings, improved screen registration accuracy and superior print quality. ■

Mark W Evans is Managing Director of Exile Technologies

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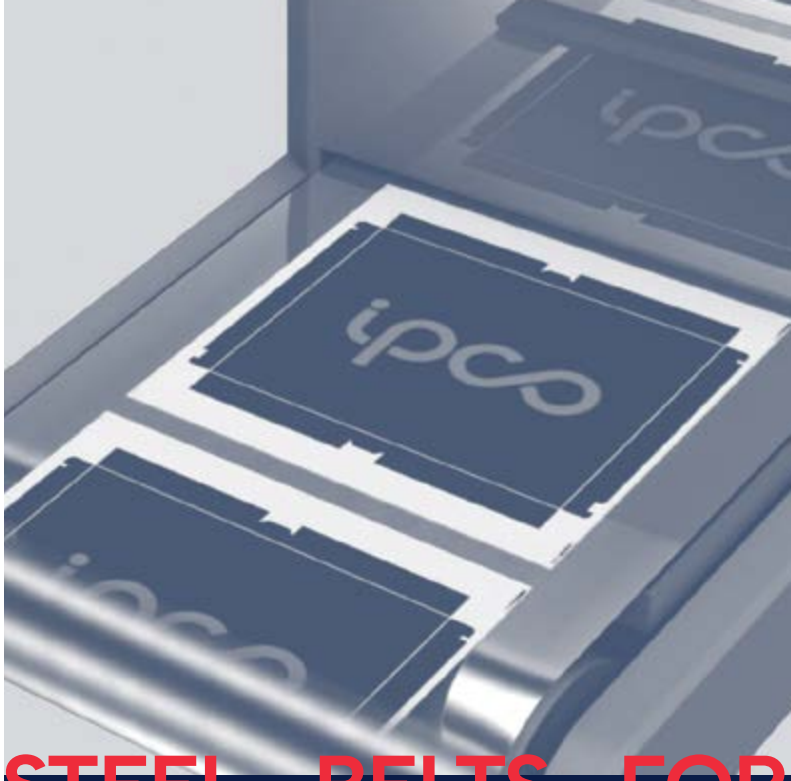

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STRENGTH THROUGH SYNERGY

Rebranding a global player in container printing technology

Koenig & Bauer Kammann GmbH is the rebranded identity of one of the international packaging community's leading suppliers of specialist printing technologies. Founded in 1955, Kammann created a successful business around the supply of high-quality equipment and knowhow for the decoration of hollow containers made from glass, plastic and metal. In 2013, Koenig & Bauer Group acquired 85% of the business, with the existing management team of Matthias Graf and Dr. Christian Maas retaining the remaining 15% stake.

Until recent months the business was known as KBA-Kammann. Koenig & Bauer marked the start of its third century in business in 2017 with a completely overhauled market appearance. It was decided to revise the group's previous KBA brand (which had been introduced in 1990 following the takeover of Albert-Frankenthal) by returning to its roots and renaming the business Koenig & Bauer. The company's 200th anniversary provided an ideal opportunity to place all activities under a strong common name again, including the creation of a new logo, business equipment, product design and communications approach.

Among the final steps in this process was a change of name for subsidiary company KBA-Kammann to Koenig & Bauer Kammann GmbH. This rebranding exercise was brought to the attention of the global decorating industry at a trade fair last autumn.

INNOVATION AND INTEGRATION

"Koenig & Bauer Kammann's knowhow and machine quality continue to be decisive features of competence," observes joint Managing Director, Matthias Graf.

The company's innovative approach will be further highlighted for the benefit of plastic container decorators via the company's exhibit at the K 2019 trade fair for plastics and rubber in Düsseldorf this October. "Articles of various dimensions and made from various materials will illustrate our expertise in three-dimensional container decoration technology," says Graf. "We will definitely surprise people with our innovations."

Stronger integration within the Koenig & Bauer Group means that synergies within the group can be exploited for the benefit of customers. "In the future, Koenig & Bauer Kammann customers will be able to participate in the strong network of other group companies," Graf confirms.

Since 1955, Kammann has been synonymous with the decoration of hollow containers made from glass, plastic and metal

DIGITAL DEVELOPMENTS

The company's knowledge, quality and performance in the area of digital technology is constantly improving. To date, more than 15 digital inkjet printing systems have been sold, for application on glass, plastic and metal containers. In 2018, this business unit represented approximately 30% of total sales.

Graf emphasises that digital printing allows individual, personalised and photo-realistic print images to be applied on a wide variety of materials and shapes (e.g. round, oval, flat and angular). This process permits articles to be decorated up to 120mm and

Koenig & Bauer Kammann's innovative approach will be displayed at the company's exhibit at the K 2019 show

In 2013, Koenig & Bauer Group acquired 85% of the Kammann business

lengths of 450mm. “Mass customisation allows customers to enter new markets and extend their product portfolio,” he explains. “But not only is the possibility for customisation beneficial… optimised set up times are also a result of modern technology in the area of container printing.”

And for customers unsure whether the capacity of an inkjet machine would be fully utilised, hybrid variations are available.

Inkjet printing for hollowware is currently the subject of intensive research at Koenig & Bauer Kammann. The positive reaction received from customers justifies the company’s decision to pursue this development path alongside its traditional screen printing strengths. Inkjet machines able to print resolutions up to 1200dpi for articles with a print image height up to 320mm are available, while output of up to 200pcs/min is achievable.

SCREEN PRINTING AND HOT STAMPING

The development of technological innovations in the field of screen printing continues to represent an equally important part of the company’s activities. Because article dimensions and shapes are becoming increasingly complex, the machine manufacturer is focused on researching and developing solutions, to give customers greater flexibility. In 2018, for example, Koenig & Bauer Kammann delivered its first base screen printing station on a K15 decoration machine, while other special screen printing options include conical and neck printing station.

Graf is confident that his company will remain at the forefront of screen printing process improvements via incremental adjustments and the implementation of innovative steps wherever possible. Furthermore, he is an advocate for the use of hybrid screen and digital printing methods alongside hot stamping in a single machine.

The Kammann R&D department developed the 3rd generation of the stroke stamping unit and also pioneered a new solution for using the hot stamping process in combination with the flexibility of the digital printing process.

Importantly, these technologies are offered without any reliance on external suppliers of inkjet colour and colour supply systems etc. Koenig & Bauer Kammann is dedicated to providing comprehensive after sales parts, service and support to keep its machines functioning efficiently. “Our technicians are available for installation, training, follow-up service and service contracts,” confirms Graf.

INVESTMENTS IN FACILITIES AND PEOPLE

To keep pace with growing customer demand for its equipment, the company’s Bad Oeynhausen production facilities in Germany are currently the subject of major investment and expansion. By the fourth quarter of 2019, manufacturing capacity will have been increased by 40%, a larger demonstration centre will have been commissioned and a bigger research and development area provided. “It is a strong commitment from our parent company,” Graf explains.

In addition, Koenig & Bauer Kammann provides versatile and thorough training for its workforce, based on many years of experience at the highest level, dual system studies in different parts of the company and further specialist training for craftsmen/women.

Over the past six decades, a combination of tradition and innovation has helped Kammann to become global player in container printing technology and it will maintain a specific focus on expanding into Asian markets. More broadly, however, as part of the Koenig & Bauer Group, the company’s management team has created a platform to become an innovative partner that fulfils all customer requirements. ■

Matthias Graf is Managing Director of Koenig & Bauer Kammann

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DEEP IMPACT

Bruce Ridge interviews Jim Raymont, Director of Sales at Electronic Instrumentation and Technology

Jim Raymont, Director of Sales at Electronic Instrumentation and Technology

In March 2019 Bruce Ridge spoke to Raymont, Director of Sales at Electronic Instrumentation and Technology (EIT) in Leesburg, Virginia USA. This is the latest in a series of articles intended to provide insight to the future of our industry from the perspective of members of Academy of Screen and Digital Printing Technologies.

BR: Prior to working at EIT you were a high school science teacher. How did the move to your current job come about?
JR: I was a high school science teacher for six years after receiving a degree in science education from Ohio State. I was certified in all areas of science including biology, earth science, chemistry and physics. I spent two years at the middle school level and four years at the high school level; teaching both honour classes and students struggling (i.e. Vinnie Barbarino and the sweat hogs) to get their one science credit needed to graduate. I also coached swimming and when an opportunity to sell (legal) pharmaceuticals came up I moved on.

BR: Was it easy to get the sales job with experience as a teacher?
JR: It was very competitive, but my science background and experience in communicating with students and people allowed me to get the job. I received a lot of product (anti-arrhythmic, anti-histamine and oral contraceptive) and sales training in that job. It was very interesting but also very frustrating. You would promote your product to doctors, but you never knew which doctors prescribed your particular products. Sales reports at that time were specific only to the postal (zip) code and not the specific doctor.

BR: So how did this get you into the business of measuring UV energy?
JR: I did not go directly from pharmaceutical sales to UV sales. I sold pharmaceuticals for three years and after particularly rough, snowy, cold winter in Ohio, combined with an early mid-life crisis, I moved to Florida to work in the scuba industry. I have always loved scuba diving. I had taught scuba diving in Ohio and moved to Florida to teach it. In addition to teaching, I also managed a dive store in south Florida; first in their Miami location and then in Key Largo.

Things changed in August of 1992 when Hurricane Andrew hit Homestead and destroyed the house. Once rebuilt, I moved to Virginia, not to sell UV instruments but to sell scuba diving computers which EIT manufactured at the time. EIT exited the scuba business a few years after I arrived to concentrate on our growing contract electronic manufacturing services (EMS) and UV instrument products. I stayed with EIT to learn and to focus on EIT's UV measurement products. Over the last 26 years at EIT, I have also helped out with our EMS business but prefer the daily variety of the UV curing business.

BR: Do you still scuba dive?
JR: Yes, I dive as much as I can living in Virginia. All told, I have done over 3,000 dives over 44 years and certified close to 500 people. I continue to dive around the world as a 'tourist' with an underwater camera as often as I can. People ask, "where is the best place to dive?" I usually respond that the next trip will be my favourite. I have been to the Philippines three times and it is probably my favourite spot. It has wonderful people and both small and big critters. I hope to get back in the next year or two.

BR: I have snorkelled, but never scuba dived – why should I make a point to go scuba diving?
JR: Snorkelling, especially in warm clear water is a great way to see the ocean. Some animal encounters such as swimming with whale sharks are best done while snorkelling. With scuba diving, you have a tank of air and can spend more time interacting with animals. I have been able to go back in history to see sunken ships and have sat in the cockpit of a Japanese Zero airplane at 60 feet below the surface. My preference at this point is diving in 80-degree water with 80 feet of visibility. I usually dive with an underwater camera and with a scuba tank you can stay down for an hour or more which is really important if you want to see and photograph wildlife. If you move slowly, the wildlife swims around as if you were not there.

BR: How did you make the transition from scuba expert to UV measurement expert?
JR: I came to EIT in 1993 for the scuba computers. As mentioned earlier, we decided

Jim enjoys the daily variety of the UV curing business

to concentrate on our core business a few years later and my UV training began. It has been an ongoing learning process ever since. Rarely does a week go by where I do not learn something new. One of the best things that I like about what I do is the variety of end use applications. I can talk to a medical manufacturer in the morning, a wood manufacturer in the afternoon, and then one of many different types of print manufacturers at the end of the day. I am living in that TV show, 'How it is Made' and I get to see how UV is being used daily.

BR: How did the EIT Company start in business?
JR: Joe May, EIT founder and CTO started the company in 1977. He is an Electrical Engineer that designed some products as a consultant. He was asked to manufacture his designs and eventually said yes, starting the EIT business on his kitchen table. EIT got involved with UV measurement in the mid 80s when we received printed circuit boards that were not fully cured. Joe holds 28+ patents in areas ranging from the measurement of gasoline octane rating to measurement of ultraviolet energy used in industrial applications. He is a real inspirational leader.

BR: EIT has an unusual work schedule of a 9-day/80-hour schedule where they are closed on alternate Fridays. How did this come about and how does it work?
JR: The 9 X 80 schedule is used by more and more companies and government contractors in the northern Virginia area. We work the same 80 hours every two weeks but do it in nine days versus the usual 10. EIT first tested it as a summer schedule and have been doing this for over two years now. It has worked well. In a two-week cycle, we work four 9-hour days and one 8-hour day in the first week. We work four 9-hour days in week two and get every other Friday off. Coming in at 6 or 6:30 AM in the winter months was tough at first. Personal and medical appointments can be scheduled for 'off' Fridays. EIT employees spend one less day every two weeks commuting in congested Northern Virginia traffic. If overtime is needed, the production team can work on the second Friday and still have a two-day weekend with their family. The 9x80 schedule also allows for factory and IT maintenance to be done on the off Fridays. As a sales person working with customers around the world, email comes in 24/7. For the most part, our customers have adjusted and we see more companies in our area also working this type of schedule.

BR: Is there something beyond LED when it comes to UV curing of coatings?
JR: Beyond LEDs? We are still in the process of transitioning to LEDs. Adoption of UV LEDs has come a long way in a short period of time. Some UV applications have rapidly switched over while others are testing and experimenting with LEDs. We have seen the LED irradiance increase and prices become more competitive to traditional UV sources. I was just at a wood show in Europe; instead of using 18 mercury-based sources on a wood line, the customer installed seven LED sources and four mercury lamps.

UV LEDs, especially with digital printers have exposed (pun intended) a whole new group of printers to UV. In many cases, I find myself going back and starting the UV education process from square one. UV LEDs are stable, but you still need to be able to control the UV and other variables in the print process.

For anyone looking to switch or purchase an UV LED, educate yourself. Know how the UV LED system works and make sure the coatings or ink that you select will work with your LED. Not all UV LEDs are created equal. There can be differences in the Irradiance (W/cm^2), Energy Density (J/cm^2), Centre Wave Length (CWL), uniformity of the array, cooling and support you will receive from a supplier. Does your LED source supplier understand UV chemistry? It is best to do your homework as it is a buyer beware situation.

Coatings have improved and we need the development of coatings to continue, especially in applications where surface cure which is a function of shortwave UV is important.

Continued over

There is a tremendous amount of R&D and investment being spent on developing short wavelength LEDs in the 270–280nm range. Disinfection and the treatment of water and air are the main drivers for the investment and UV curing applications will benefit from this technology. Shortwave (UVC) LED systems are improving in power, lifetime of the chips and cost. We are still a few years from commercial and economic viability with UVC LED arrays for curing. Many companies are testing UVC LED prototypes that are being produced by source manufacturers. I look forward to watching the LED progress.

Beyond LEDs we have heard of some companies using UV excimers that have an output in the 172nm region. There may be some advantages with food packaging applications as the use of photoinitiators is reduced or eliminated.

BR: Do you attend other printing related shows other than SGIA (now Printing United)?
JR: We usually rely on one of our distributors to work with us at print shows. We have done FESPA and that was a good show for us. We plan to attend the InPrint show in November. The work we did this week at Nazdar will help with the high-speed ink jet equipment in the market. Ink jet equipment using LEDs is moving faster and we need to come up with ways to measure and monitor the energy used to cure the inks on fast moving systems.

BR: We have worked together on seminar panels at previous SGIA shows and you do a great job at communicating complicated technical information in an easy to understand language. Is this something you learned from teaching in high school?
JR: Probably so. It is easy to see on someone's face when they are not understanding what you are telling them. This is particularly obvious with the education of UV since you are talking about something we cannot see. It is very abstract. I often rely on everyday life analogies that can related to the way UV energy works and is measured.

BR: What are some of the more interesting printing applications you have seen in your travels?
JR: I was just in Asia in August this past year, and there were people printing with UV coatings on cell phones and cameras with very high-tech equipment, but they didn't really understand what they were doing. There were no procedures in place. They went from broadband mercury curing to LED curing without knowing anything about how it is done.

The advent of the way inkjet has taken over the SGIA show and UV technology is the key driver to the growth of this technology change. That is exciting for us at EIT.

BR: You travel all around the world for EIT. What are the benefits of doing international travel?
JR: Well first off, I get to see a lot of places and meet a lot of people which I still very much enjoy. I wish I had paid better attention in school in history class. I like to think I have friends all over the world. Anyone that has travelled extensively for business knows that while you may see a lot of places; the list of places that you want to go back to and really see on a non-business trip keeps getting longer.

I spend a lot of time when travelling working with and educating our distributor network on our products and keeping them focused on providing the best information to their customers. Professionally, I get to create solutions for various applications with different cultures. I find this very gratifying.

BR: Has being a member of the Academy been beneficial for you?
JR: I truly enjoy the company and expertise of the Academy members. I am UV focused and not necessarily a printing expert per se like so

Diving enthusiast Jim originally worked for EIT selling scuba diving computers, which the company manufactured at the time

many of the members. It has been really great to be associated with the printing experts of all disciplines.

BR: What do you think about trade shows today? Have your expectations changed at trade shows?
JR: Yes, my expectations have changed. My mother told me to sell something small that provides a high value. We can show EIT products in a small booth and at trade shows are committed to not only trying to find new customers but to also focus on servicing our existing customers. I learned a lot about sales with the pharmaceutical company. There was an emphasis on making the most out of the available time slot as doctors were always on a short time frame and wanted you to get to the point without a lot of extra information. This has helped me throughout my EIT career, especially at trade shows.

BR: Where are your favourite places to go to find new information on the industry?
JR: I am involved with RadTech, a trade association to promote UV& EB technology. I read trade magazines and I also try to pay attention to industry websites. EIT needs to stay ahead of industry measurement needs so I am always looking for applications that EIT can participate in with either our existing or new products.

BR: It is always great to work with you, and it is even better to talk with you while drinking beer…
JR: If you love beer, this is a great time to be alive. There is great beer everywhere you go – I love hoppy, west coast style IPAs that have a little citrus flavour in them. There have been many UV problems solved or product ideas hatched over an after work beer. The only thing better than an Academy dinner would be an Academy dinner with the option to have beer instead of just wine. Bruce, that should be our goal for the next dinner! ■

The Academy of Screen and Digital Printing Technologies (ASDPT) is composed of professionals that have dedicated a large part of their career to the education, development and innovation to the industry. This interview was conducted by Bruce Ridge, Director of Technical Service, Nazdar Ink Technologies. Bruce has been a member of the Academy of Screen and Digital Technologies since 2004.

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Marabu addresses pressure to make plastic more sustainable

At the K 2019 trade fair for plastics and rubber, ink manufacturer Marabu will present products to open up new possibilities amid growing concern over the sustainability of plastic. The company's Ultra Jet DUV-C line for directly printing PET packaging has been tested and confirmed to display minimal migration, and is suitable for de-inking so that the inks can be removed from PET bottles when they are recycled – until recently, de-inking was primarily used for recycling paper. Marabu is also offering a new water-based inkjet ink for directly printing flexible food packaging that is available exclusively for machine manufacturers and system integrators.

K 2019 will showcase Maqua Pad MAP, the world's first commercially available water-based pad printing ink, which can be used for adding decorative elements, and for sensitive applications, such as children's toys. The water-based formulation is odourless, is manufactured without the use of BPA or BPS chemicals, and has very low VOC and low PAH levels.

Other exhibits will include Marabu's fast-curing/printing Ultra Pack UVFP range for migration-sensitive PE/PP plastics; Ultra Pack LEDC inks for both conventional UV curing and complete LED-based curing of printed packaging; and a new UV-curable solution for credit cards, ID and cashless payment cards: Ultra Card UVCC screen printing ink, which is suitable for printing on coated or uncoated PVC and PLA films (PLA = polylactide, a bioplastic i.e. bio-based polymer).

Suitable for low-temperature UV LED curing, Marabu's Ultra Pack LEDC ink range is compatible with a broad variety of plastics

www.marabu-inks.com ■

Inkcups brings X360 to the European market

Following a successful year of operation at commercial production facilities in the US, Inkcups' latest high-speed rotary inkjet printer, the X360, has now been released to the European market

The X360 is the newest addition to the company's overall direct-to-cylinder product line. Capable of printing on tapered and straight-walled cylinders, it features tooling for tilting conical parts to print 360 degrees. Applications include metal and plastic sports bottles, candle holders, glassware, stainless steel tumblers and industrial parts such as oil filters.

The X360 offers on-demand, full-colour printing on cylindrical parts up to 305mm tall with a 40–120mm diameter. The machine prints CMYK plus two highly opaque UV LED-curable white inks, with an optional varnish for additional visual impact. Maximum image resolution is 900dpi and the printer is compatible with Adobe Illustrator, Adobe Photoshop and CorelDraw.

The X360 is now available for order in Europe.

www.inkcups.com ■

Inkcups' X360 high-speed rotary inkjet printer

Roland introduces new multi-function dye-sublimation printer

The Texart RT-640M, Roland DGA's new multi-function dye-sublimation printer, gives users the freedom to print directly onto coated polyester fabrics, or to sublimation transfer paper, using Texart SBL3 sublimation inks.

The Texart RT-640M offers a direct-to-textile print option as well as printing to transfer paper

The RT-640M's media take-up incorporates adjustable front rollers for no-skew printing, as well as magnet weights for improved tensioning and performance. Eight-channel printheads are compatible with a wide range of materials, while optimising ink coverage for lower operating costs. The new printer offers users the advantages of the Roland Bulk Ink Switching System, which features 1000cc pouches and automatically switches to a back-up pouch for non-stop printing in 4-colour configuration. Users also stand to benefit from an ink collection channel within the platen of the RT-640M, designed to facilitate direct printing onto mesh, flag, voile and other thin textiles.

Included with the printer is ErgoSoft Roland Edition 2 software, which offers tools for textile dye-sublimation applications and allows users to RIP up to eight jobs simultaneously.

"The RT-640M is an unbeatable investment for anyone looking to get into the dye-sublimation market," said Lily Hunter, Roland DGA Product Manager, Textiles and Consumable Supplies. "This value-packed inkjet offers the most flexibility you can get in an entry-level sublimation printer. Its multi-function capabilities allow users to easily and cost-effectively produce everything from flags, soft signage and backlit signage to ChromaLuxe photo panels, apparel, and décor."

www.rolanddga.com ■

Easiway Systems steps up its 'green' game

A new initiative at Easiway Systems – 'Easiway Green' – aims to reduce the company's landfill waste by 30%, recycle paper in-house and create its own compost. "We have started a vermicomposting ecosystem," explained Taylor Loeber, Easiway's Environmental Sustainability Coordinator. "What this means is that 30% of our trash, that would usually end up in landfills, instead is being put into a compost bin with worms.

"To make our worm compost even richer we have switched the office to compostable coffee pods," she added.

Any recycled paper in the office will be shredded and then added to the composting bin to act as bedding for the worms. This paper will be consumed along with leftover fruit, vegetable, coffee pods, and other employees' lunch scraps and ultimately turned into fertiliser.

The company will use this organic compost to help with the creation of an office garden, located outside Easiway President John Schluter's office. The garden will be irrigated using rainwater drained from the roof of the facility and the produce – fruit, vegetables and herbs – will end up in the break room for employees and guests. Any extra food will be donated to local shelter or recycled back into Easiway's composting system.

www.easiway.com ■

Easiway Green is a sustainability initiative to create organic compost from the company's leftovers

Change of location for IMI Europe's 20th Anniversary Digital Print Europe event

Digital Print Europe 2019 has a new central European venue, with a move to Berlin, Germany. The event, held from 7–10 October 2019, is built around IMI's strategic Digital Printing Conference and includes a Mergers & Acquisitions forum, Market Reports Live sessions and the Inkjet Academy.

"The event focuses on the strategic direction of the industry, with the main conference supported by a Mergers & Acquisitions forum and Market Reports Live sessions," explained Tim Phillips, Managing Director IMI Europe. "IMI and IMI Europe conferences are the forum where the industry meets to discuss its future, and we are preparing an excellent programme for attendees. We will announce more about the event in the coming months and look forward to hosting a lively and informative debate."

www.imieurope.com ■

Vastex expands V-1000 economy press line

An eight-station, eight-colour V-1000-88 model has joined Vastex' V-1000 economy line of manual, commercial-grade screen printing presses

The new machine "costs hundreds less than competitive eight-colour presses while offering greater rigidity," said Mark Vasilantone, Vastex President. "The V-1000-88 is the first press of its kind for shops on a budget to reduce up-front investment without the risk of out-growing the equipment when high capacity, production flexibility or special effects are required," he added.

Vastex' V-1000-88 manual screen printing press is expandable up to eight stations and eight colours

The V-1000-88 features rubber-coated steel pallets and a floating head design that allows all-heads-down printing. With six-way head levelling and tool-free micro registration, it is said to deliver precise multi-colour registration previously limited to machines of significantly higher cost.

The five-leg frame with interconnecting service pan provides greater structural integrity and tip resistance than four-leg designs, permitting the addition of pallets and accessories.

Because the design is modular, the frame can be ordered with any number of printheads and pallet arms, allowing smaller shops to minimise initial cost, and add stations and colours when needs increase.

A fully expanded Model V-1000-88 press with eight stations and eight heads can be set up to boost output on a single job, or to print multiple jobs simultaneously. It accepts over 50 Vastex pallets including oversized pallets to 50 x 60 cm for over-sized prints, and heavyweight vacuum pallets for transfers, signage and flat stock.

www.vastex.com ■

Adjusting exposure on the fly

The LED-5000 exposure unit from Lawson Screen & Digital Products features a programmable HMI colour touchscreen and up to 40 programmable exposure settings, making it simple to dial in exact exposure settings and change exposure times at the touch of a button.

LED touch screen controls allow for customised vacuum delays for high production needs, inspection lights and 'on the fly' exposure settings based on mesh count, emulsion, coating techniques and other parameters.

Lawson's LED-5000 exposes most liquid emulsion and capillary film screens in under 45 seconds. The unit's LED/UV enhanced lighting system is equivalent to using a 5000-watt metal halide light, but with energy-efficient LED technology.

Manufactured in the USA, all units ship fully assembled with a standard 120 volts plug. Standard Sizes are 24" x 31", 32" x 48" and 42" x 50" with custom sizes available on request.

www.golawson.com ■

The LED-5000's digital control system simplifies exposure settings

20 years of Xaar's 128 inkjet printhead

This summer Xaar celebrated the 20th birthday of its 128 printhead. Initially conceptualised for use in desktop fax machines, the Xaar 128 proved to be better suited to other sectors and quickly became a firm favourite in the coding and marking and wide-format graphics markets. Launched in 1999, the printhead was the driving force behind the first industrial inkjet revolution in wide-format graphics. Its compact footprint and light carriage weight of only 16 grams, combined with its simple electronic interface, enabled quick and easy integration into printers by OEMs.

The Xaar 128 birthday celebration at Huntingdon

Offering the ability to print outdoor or indoor graphics, barcodes, outer case carton coders or poster printing, the Xaar 128's versatility and compatibility with many ink types contributed to its popularity over the last 20 years.

With over 1.5 million Xaar 128 printheads in the market, the success of the Xaar 128 was officially marked with the cutting of a 'birthday' cake at Xaar's factory in Huntingdon, UK, where the Xaar 128 is manufactured.

"The longevity of the Xaar 128 and its relevance in today's market is testament to the cutting-edge technology it deployed 20 years ago," said Graham Tweedale, Chief Operations Officer at Xaar. "The fact that we are celebrating its birthday and even seeing new applications, is a real source of pride for us and demonstrates the impact of Xaar's investment and lead in industrial inkjet technologies."

www.xaar.com ■

Ruco focuses on environmental compatibility and user friendliness

Ink manufacturer Ruco Druckfarben will present its screen printing ink series 955LED-LM at K 2019 this October. Revealed to the trade public three years ago at K 2016, the ink series was developed for printing on plastic hollow bodies made of polyolefins, in particular polyethylene tubes. Thanks to a low-migration formulation, 955LEDLM meets stringent safety requirements and is approved for printing onto the outer surface of plastic packaging for the food and cosmetics industries. The inks have a completely silicone-free formulation that allows for combining and embossing. Being a pure LED-curing system, 955LED-LM does not require additional UV-curing; however, curing by means of conventional UV technology is still possible.

In addition, Ruco will be showcasing its T35 pad printing inks, and one- and two-component T120 inks for rotary pad printing, as well as the T200 'all rounder' range and low-migration 085UV-LM ink series.

Visitors to Ruco's stand can pick up a 'surprise gift' showing the printing results that can be achieved using the inks on display.

www.ruco-inks.com ■

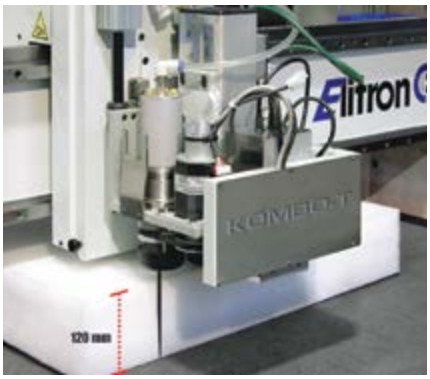
Elitron presents latest Kombo T cutting system

Together with its partner Suteau-Anver, Elitron – producer of digital cutting solutions for the industrial and packaging sectors – will be exhibiting the latest Kombo T cutting system at K Show 2019.

The updated system has been specifically developed to cut and mill plastic, rubber and foam materials. User-friendly software and a high-resolution video projection system help the operator to easily nest the shapes to be cut, and to obtain the maximum possible yield from the material/s.

Elitron's cutting professionals will be on hand on the Suteau-Anver stand to discuss cutting requirements and to demonstrate the Kombo in action.

www.elitron.com ■



Elitron Kombo T cutting head

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THEIJC 2019

Inkjet world to meet at the sixth edition of TheIJC in Düsseldorf

Over 60 speakers will present their research on core inkjet technologies at TheIJC 2019, held from 29–30 October at Crowne Plaza Düsseldorf. Several hundreds of developers, innovators and decision makers are expected to join the event to peer into the future of digital printing and assess its impact on various manufacturing processes.

TheIJC (The Inkjet Conference) opens with a plenary session before dividing into three tracks. The plenary session covers printhead innovation and features the latest developments from the world's leading manufacturers. Track One covers hardware and software; Track Two is for fluids and analysis; Track Three stages research and innovation. Delegates are free to move between tracks and are encouraged to vote for the best speakers. With many presentations dependent on the outcome of research and development, some titles will not be confirmed until nearer the event.

CONFIRMED TITLES:

On Plenary Session (printhead architecture):

- Xaar's 5601 product line chief architect will provide a much anticipated technology update.
- Memjet will discuss a modular inkjet printing system for industrial printing.
- Fujifilm Dimatix will explore inkjet printhead design and approaches to modelling the complexity.
- Seiko Instruments will explain how to make printhead jetability wider.
- Konica Minolta (Industrial Inkjet) will highlight the importance of printhead constraints.

Over 60 presentations will cover all aspects of inkjet technology

Titles from Kyocera, Ricoh and Toshiba Tec are still under wraps for now.

On Track One (hardware and software):

- Kodak will look beyond the printhead at the software and electronics required for high quality output.
- Baumer will present on colour inspection and process management.
- Archipelago Technology will push the boundaries on high viscosity functional fluid deposition.
- Meteor Inkjet will explain its techniques, tools and tips for waveform optimisation.
- Global Inkjet Systems will explore the world of screeners and how to optimise them.
- Diener Precision Pumps will look at how design can improve the longevity and reliability of fluid systems.
- UMS will focus on printhead coating for use of chemical aggressive inks and binders, dissolved oxygen and total gas measurement in inks.
- Profile Recruitment will share tips on how to attract and keep the best talents in inkjet.

On Track Two (ink formulation, additives, milling, particle size analysis):

- Agfa will bring functional fluids out of the lab and into the mainstream, for printed electronics, glass etching and other applications.
- Fujifilm Ink Solutions will disclose the challenges and opportunities in developing ink for MEMS printheads.
- BASF will highlight which formulation additives will improve your inkjet ink and which new raw materials are available for aqueous inkjet.
- Netzsch will look at the start of the process, the milling of pigments, and its optimisation in inkjet manufacturing.
- Soliton/Entegris will dispel some of the myths and misconceptions about particle size.
- Krüss will explain the important physico-chemical parameters when formulating inks and how to characterise and optimise them.
- Dataphysics will bring its knowledge and expertise on surface analysis to the inkjet world, demonstrating inkjet process simulation and the potential for cost-effective printed electronics.
- Adphos will highlight the shift to aqueous ink and how increased jetting performance requires additional drying capacities.
- Lambda Technology will consider the energy requirements for drying aqueous ink and how to minimise them.
- Evonik will talk about ideal surfactants for

TheIJC networking arena brings together key technology suppliers, OEMs and all involved in digital printing for industrial applications

LED curing inkjet inks and their influence on curing speed.
- Formulaction will analyse high shear rate rheology of inkjet inks by microfluidic rheometer.
- AT Inks will present on LED curable inkjet ink design.
- Phoseon will explain what's new in UV LED.
- Print-Rite New Materials from China present on their improved dye sublimation ink for textile printing and new UV-curable ink for rigid materials.

On Track Three (inkjet research and innovation for chosen market applications):
- Inuru will present fully inkjet-printed, air stable OLEDs for signage and packaging.
- Added Scientific will translate 3D inkjet printing to an industrial manufacturing approach for medicines.
- The University of Cambridge will explore the aerodynamics of direct-to-shape printing, as well as flow-induced damage and chemistry within printing flow systems.
- The Hahn-Schickard Society will highlight the benefits and challenges of digital printing for printed electronics.
- The Rochester Institute of Technology will show the effects of ink, substrate and target line width on the line quality printed using a materials inkjet printer.
- ChemStream will explore inkjet 3D printing, high resolution and multi-material digital manufacturing.
- Fraunhofer ENAS will present robot-guided functional inkjet printing on non-planar surfaces for electronic applications and tolerances of µ-electronic device components.

COMPANIES ATTENDING

The current list of presenting and exhibiting companies includes: 3M, Added Scientific, Adphos, Agfa, Allnex, Amazon Filters, Archipelago Technology, Arcolor, Armor, Arranged, BYK, BASF Colors & Effects, BASF Personal Care & Nutrition, ChemStream, Clariant, Cobetter, ColorGATE, DataPhysics, Digital Direct, Dr. Hoenle, DSM, DuPont Advanced Printing, Encres Dubuit, Evonik, Formulaction, Fraunhofer ENAS, Fujifilm Dimatix, Fujifilm Imaging Colorants, Gardner Denver Thomas, Global Graphics, Global Inkjet Systems, Hahn-Schickard-Gesellschaft, Hamamatsu, Hapa, Heraeus, ImageXpert, Industrial Inkjet, Integration Technology Limited, Inuru, iPrint, Kao Collins, KIWO, KNF, Kodak, Krüss, Lambda Technology, Lubrizol, Marabu, Megnajet, Memjet, Meteor Inkjet, Nazdar, Netzsch, Notion Systems, NTS Group, OIKE, Pall, Phoseon, Print-Rite, Rex-Tone, Ricoh, Rochester Institute of Technology, Seiko Instruments, Siegwerk, Soliton, Sun Chemical, Tiger Coatings, Toshiba Tec, Toyo Ink, Trijet, UMS, University of Cambridge, Ushio, VKT and Xaar.

Inaugurated in 2014, TheIJC looks at a chain of events starting with the core technology and following through the integration to the market application. Each development or evolution in the core technology is assessed against the application and the market requirements. Some core technology developments will revolutionise the application, whilst the same core technology development will be irrelevant in another market. With over 60 presentations, TheIJC covers all areas and explores the links between them.

PRACTICAL INFORMATION

TheIJC 2019 features 60 presentations, an exhibition of 80 tabletops and an expected total of over 500 participants. Last tabletop slots are still available – for more information please contact the organisers.

Delegate booking with group discounts, as well as discounts for ESMA members and academics are available. ■

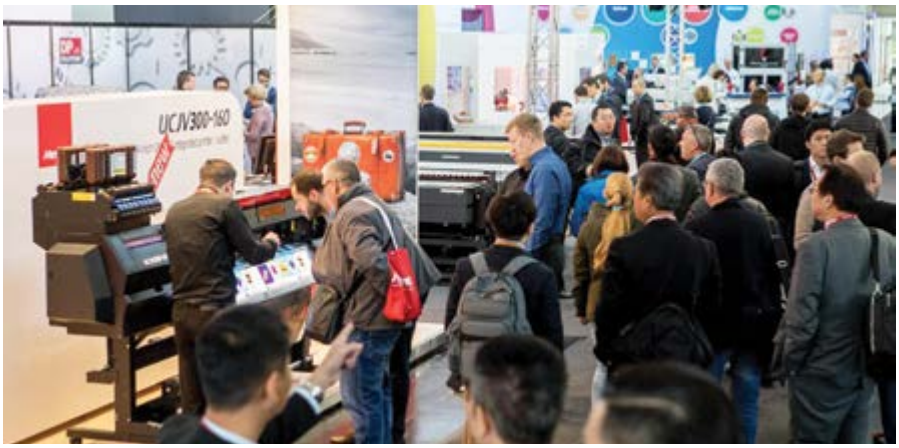
Further information:
web: www.theijc.com
www.youtube.com/theijc

POSITIVE BOOKING FIGURES FOR INPRINT MUNICH

Goods manufacturers and print providers take advantage of new technologies

More than 100 exhibitors from 15 countries have already confirmed their participation in The International Exhibition of Print Technology for Industrial Manufacturing, occupying nearly three quarters of the 2017 exhibition space with bookings ongoing.

Consumer-driven markets have created an upward spiral of demand for bespoke design solutions, limited editions and individualised products, opening up new business potential for both providers of printing technology as well as industrial manufacturers. Companies across industries are increasingly aware that they can gain competitive advantages and add value to their products by implementing innovative printing technology as part of their manufacturing line.



From 12–14 November 2019, InPrint Munich will once again be the innovative powerhouse for the emerging community of printing and industrial manufacturing specialists

TOMORROW'S WORLD

Over recent years, print technology providers have been working hard to develop new equipment and solutions capable of transforming or enhancing industrial processes, often in joint projects or partnerships with manufacturing specialists.

Advances in automation and robotics, vision systems, curing equipment, and software for workflow and colour management, as well as more effective print head technology, fluids and inks are the biggest contributors to the current growth of print technologies in many sectors of industrial manufacturing, including smart packaging solutions, printed electronics, functional print on fabrics, films and foils, customisation of brand products, decorative floorings and furnishings, automotive interiors, fast fashion and many others.

Industry professionals see the print industry on a successful path as it capitalises on new technologies, gaining a standing in industrial manufacturing and strengthening the competitive power of print service providers and their clients, notably branded goods manufacturers and industrial production companies.

BUSINESS BAROMETER

Holger Busch, Managing Director of the German Association for Print and Media in Bavaria (VDMB) and long-term strategic event partner, praises the industry's innovative drive, highlighting the crucial role of InPrint Munich as the essential business barometer for the industry when it comes to bringing innovations to the market:

"InPrint shows that industrial print is a growth market with enormous potential for innovation in Germany and Europe. It also demonstrates that printed products have gained enormous importance for production and added value in many industries. The German print industry is in an excellent position here, presenting itself with a high innovative drive and exceptional standard of performance. We value InPrint as an outstanding partner and look forward to continue our cooperation for 2019."

Nicola Hamann, Managing Director at show organiser Mack Brooks Exhibitions, shares the positive outlook: "Both the print and manufacturing industry are increasingly open to

new partnerships and business models, leading to the ongoing evolution of technical possibilities for print products in industrial production. The ongoing success of InPrint lies in its capability to foster this innovative drive, attracting a growing specialist community looking to discuss or source new printing solutions in a vibrant business atmosphere."

InPrint Munich has now clearly moved on from a developmental networking event into a leading industry platform and trade exhibition, with increasing sales activity on the show floor. The previous show in 2017 attracted around 3,000 visitors from 63 countries – these were high-profile industry professionals from the printing industry and a wide range of industry sectors. Around 90% of visitors at the previous show attended to seek out specific products or suppliers that could help them improve their production process and generate new business; every third visitor came with definite investment plans.

INPRINT CONFERENCE

The ever-popular 3-day conference programme alongside the exhibition provides further knowledge and insights into the latest market developments, technology trends and innovation projects. All visitors and exhibitors at InPrint 2019 are invited to attend free of charge to benefit from interesting discussions and valuable networking opportunities. Conference topics for 2019 cover the following subject areas:

- Printhead Technology
- Inks
- Processing Technologies
- Machine Integration
- Metrology
- Software
- Robotics
- Printed Electronics
- 3D-Printing
- Case Studies & Successful Implementation Projects
- Research & Market Development

The full conference programme and further updates will be published online at www.inprintmunich.com/conference

EXHIBITORS

Companies exhibiting at InPrint Munich 2019 include: adphos Digital Printing, Agfa, ARMOR, Bergstein Digital, ColorGATE Digital Output Solutions, EIT, ESC, FUJIFILM, GEW, Global Inkjet Systems (GIS), Grünig-Interscreen, Hapa, Dr. Hönle, Hamamatsu Photonics Deutschland, Hymmen, Lotus Holland Industriele Produkten, Lüscher, Marabu, Meteor Inkjet, Mimaki, Nazdar, Phoseon, PLASMATREAT, Seiko, Sensient, SignTronic, SPS, Sun Chemical – SunJet, Technigraf, THIEME, Tiger Coatings, Wemhöner Surface Technologies, Xaar and Zentner. First-time exhibitors include: 3M Deutschland GmbH, SPSD, CADIS Engineering GmbH, CHESPA SP. Z O.O., East Core (Apache), Radium Lampenwerk GmbH, and Siegwerk Druckfarben AG & Co. KGaA.

VISITOR INFORMATION

InPrint Munich takes place from 12–14 November 2019 at Munich Trade Fair Centre in Germany in Hall 6, accessible via entrance East. Opening times are from 9am to 5pm on all three exhibition days. The ticket pre-sale starts in autumn via the Online Ticket Shop at a special online rate. Alternatively, full price tickets can be purchased on-site during all three exhibition days.

Further visitor information including exhibitor list, exhibition profile and useful information on travel and accommodation can be found on the show website. The online newsletter 'InPrint News' in English and German is published monthly in the run up to the show and includes recent news about the exhibition and the industry. The newsletter can be requested via the show website. ■

Further information:
web: www.inprintmunich.com

PRINTING UNITED

New event breaks down segment boundaries and brings printing community together

Bringing the entire printing industry together under one roof, PRINTING United is a new event owned and operated by SGIA in partnership with NAPCO Media. It will launch on 23–25 October, 2019, in Dallas, USA. Focusing on the opportunities presented by the convergence of printing technologies and markets, PRINTING United will cover print and finishing technologies in industry segments from apparel to graphic, packaging to commercial, and industrial. Its objective is to convey all components of integrated solutions to satisfy virtually any client need.

"There's a transformation taking place in the printing industry, a blurring of segment boundaries as print service providers (PSPs) seek out new products and technologies to better serve their customers," explained Mark Subers, President/CRO, Printing and Packaging, NAPCO Media. "Convergence is changing how PSPs and their suppliers do business, the technologies they choose and the information they need to stay ahead of the competition."

"PRINTING United represents a sea change in event strategies for addressing the industry environment," Subers added. "Rather than focusing on a single industry segment, it's welcoming in the entire community."

BIGGER

PRINTING United brings together the universe of printing, serving markets including apparel decorating, graphics production and installation, functional printing, commercial printing, packaging printing and in-plant.

"PSPs who want to improve their businesses and better serve their customers need access to suppliers and manufacturers," noted Ford Bowers, President & CEO, SGIA. "PRINTING United provides this access across market segments," he continued. "It's critical that PSPs have the opportunity to build their connections."

In a survey conducted by SGIA and NAPCO Research in autumn 2018, 80% of PSPs said they believed a consolidated printing industry event would serve them

Ford Bowers, President & CEO of SGIA

better than single-segment events.

"PRINTING United will provide a powerful return on investment for PSPs who see opportunity for expansion within and beyond their primary market segments," Subers added. "With less time out of the office, they'll reduce travel expenses but achieve more with access to the equipment, education and networking that drives innovation."

BETTER

PRINTING United is built on the strong foundation of the SGIA Expo, strengthened and extended by NAPCO Media's trusted brands and extensive audience reach.

"It's a time of great opportunity and convergence in the printing industry," said Bowers. "According to our research, 95% of printers are seeing remarkable opportunities for expansion," he continued. "Commercial printers are considering adding wide-format graphics and packaging. Rigid packaging printers are adding flexible packaging to the mix. Digital textile printers in the home furnishings realm are exploring fast fashion. To make all that happen, they need education and interaction," Bowers concluded.

PRINTING United's 96-session conference program features sessions tailored to apparel, commercial, functional, graphics, packaging and in-plant printing on topics ranging from technology to business operations. Three pre-show intensive workshops on 22 October focus on starting a wide-format graphics business, digital textile printing and convergence opportunities. Three amphitheatres on the show floor will bring additional opportunities to learn from exhibitors and thought leaders.

"Learning is critical, especially in an industry that's changing as quickly as printing is," stated Bowers.

Supplementing the conference, workshops and amphitheatre sessions are networking events featuring informative speakers for the apparel, functional printing, sustainability and Women in Print Alliance communities.

BOLDER

The expansive show floor is also home to The Experience Zone, a 4,000-square-foot exhibit with over 100 printed applications that demonstrate how printing shapes consumers' lives.

"Our industry touches everything around us," Subers said. "The Experience Zone will put a face on it, with displays from in-home, out-of-home and retail environments. We want the PSPs visiting The Experience Zone to leave inspired to try new product lines and markets."

In addition, PRINTING United is hosting an Opening Night Party at Gilley's Dallas on 23 October.

"The launch of PRINTING United is something to celebrate," Bowers said. "It encompasses and serves today's printing industry better than any event in the printing and packaging space has before. If you're part of the industry, you need to be there from the start." ■

PRINTING United is built on the strong foundation of the SGIA Expo

Further information:
web: PRINTINGUnited.com

STAYING CURRENT WITH FESPA

Enticing visitor features pull in the crowds at FESPA 2019

During 14–17 May, FESPA Global Print Expo 2019 welcomed over 20,000 visitors, with one in three reporting that updating their industry knowledge was a focus for their visit. Around 7,000 unique visitors attended FESPA'S six features: Printeriors, Print Make Wear, Colour L*A*B*, the Trend Theatre conference programme, the FESPA Awards display and the World Wrap Masters.

COLOUR L*A*B*

Making its feature debut at FESPA was Colour L*A*B*, a technology showcase and supporting conference programme to help print service providers improve colour management practices in their print businesses. A total of 917 visitors took part in the guided tours, attended the conference sessions or interacted with the feature. One in three of these were owners or directors, and in keeping with FESPA's international audience, visitors to Colour L*A*B* came from a total of 68 countries.

"Colour L*A*B* was a good environment to emphasise the importance of colour management in the digital print process," commented Stefan Barbieri, CEO of Colour L*A*B* exhibitor Barbieri Electronic. "Our stand was positioned next to Colour L*A*B* and we had a number of visitors come to speak to us from the feature who were looking for deeper explanations and more information."

OTHER FEATURES

Print Make Wear, which returned to FESPA Global Print Expo for its second year, covered more floor space compared with the first edition in 2018. The expanded feature and tours achieved a 32% increase in attendance in 2019, with a total of 3,878 visitors including representatives from many prominent garment brands. Interest in Print Make Wear reflects the fact that 26% of the wider FESPA audience were interested in garment decoration and manufacturing.

"It was really good to see the whole process and production; you could see the material being loaded, printed and all the design aspects of it," said Robin Sprong of Robin Sprong Wallpaper Design. "I think these days, everyone wants everything instantly and I think Print Make Wear is a good example of showing just how instantly you can get digitally printed clothes. I thought was a really good part of the show."

Other popular features included Printeriors, which showcased a collection of creative examples of printed décor for both interior and exterior applications, using designs representing the elements, designed by illustrator Jasper Goodall. Located next to Printeriors was the FESPA Awards showcase, a display of the shortlisted entries to the 2019 Awards, illustrating a variety of printed and non-printed effects and technologies. Over 2,000 visitors viewed the Awards and Printeriors displays.

The World Wrap Masters vehicle wrapping competition was watched by 1,121 visitors who came to see competitors battle it out over the four days to be crowned World Wrap Master.

Finally, the Trend Theatre conference programme hosted daily seminars throughout the duration of the exhibition with upwards of 300 attendees in total across the week, and several standing room only sessions.

"As part of our wide investment programme to support out community our visitor features play an important part in any FESPA event, delivering added value to visitors in those areas of the market where we see growing demand for information and market intelligence," said Sean Holt, Executive Director of FESPA. "We're delighted to see the success of these events at the show and look forward to evolving them further as we develop our plans for the 2020 Global Print Expo."

*Colour L*A*B* at FESPA Global Print Expo 2019*

FESPA Global Print Expo 2019 welcomed 20,780 individual visitors from 137 countries over the course of four days

NEW SPORTSWEAR EVENT

The next FESPA Global Print Expo, which takes place from 24–27 March 2020 at the IFEMA exhibition centre in Madrid, Spain, will feature a co-located exhibition dedicated exclusively to sportswear manufacturing.

With a focus on the latest technologies in on-demand and customised sportswear production, Sportswear Pro will bring together suppliers of solutions for three key areas of sportswear manufacture: design (CAD/CAM and 3D body scanning); production (CMT ['cut, make and trim'], bonding and knitting) and decoration (printing, engraving, embroidery and laser appliqué systems), as well as developers of accessories, smart textiles and printed electronics.

In addition to the exhibition, the new event will feature a dedicated conference programme reflecting the business priorities of sportswear manufacturers and designers, such as sustainability and automation.

The co-location of Sportswear Pro with FESPA Global Print Expo 2020 will allow visitors to move seamlessly between the two events, taking advantage of the array of screen and digital printing exhibits within the FESPA textile halls, and also providing access to the Print Make Wear educational feature. This will take the form of a fast fashion factory, demonstrating a range of garment manufacturing technologies through guided tours, expert chats and catwalk displays. ■

Further information:
web: www.fespa.com
www.sportswearpro.com

MICROPLASTICS

Frank Toma looks at the issues surrounding the restriction of microplastics

Frank Toma is Chairman of ESMA's Health, Safety and Environmental Protection Committee

A couple of weeks ago I read an article in a newspaper concerning the so-called 'Great Pacific Garbage Patch' – a huge area in the Pacific Ocean where, according to estimations, 80,000 tons of garbage has accumulated over the years. And 99% of this rubbish consists of plastic. Of this again, around 6,400 tons consist of particles <5 mm, fitting the definition of microplastics. Microplastics are quite persistent in nature and can already be found in fish or fish-eating animals like sea birds etc. In addition, once part of the food chain, microplastics are already detected in the human organism. And neither the effects of microplastics on the environment nor on human health are well understood.

For these reasons the ECHA decided to take a closer look at the issue, and in March 2019 published a proposal on the 'restriction of intentionally added microplastics'.

LABELLING AND REPORTING

In case you ask yourself now: "So what? What do I have to deal with that?" you might reconsider. Polymers (= plastics!) are a relevant component of many formulations for coatings and paint – binders, additives etc. After application, the polymer particles are usually part of a film, which does not fall under the definition of microplastics. Also, a release of particles is usually not part of the function of a coating or an ink. For that reason, a ban on the use of microplastics in coatings and paints is not intended. But since the release of microplastics from coatings and paints is expected – mostly from waste disposal and the cleaning of equipment, the ECHA proposal asks for duties concerning labelling and reporting:

Labelling: According to the proposal, paints and coatings products containing microplastics have to be labelled with information regarding the correct disposal of waste as well as the cleaning of equipment to minimise releases to the environment. As with other information on the label, this information has to be written in the official language of the member state of the EU, where the product is placed on the market. With this requirement the ECHA expects a reduction of emissions to the environment.

Reporting: The proposal asks for a reporting requirement, which should enable the European Commission to gather data concerning the use of microplastics in coatings and paints.

Formulators of coatings and paints will be subject to the labelling requirement, while the reporting requirement also addresses all downstream users.

If the restriction comes into effect, there will be a transitional period of 18 months for the information requirement and of 12 months for the reporting requirement.

EFFECTIVENESS AND FEASABILITY?

Personally, I'm not so sure about the effectiveness and the feasibility of the measures suggested by ECHA. Labels, thanks to different legal requirements, are already pretty full of information. And in my daily experience with downstream users, I don't see too many people taking a second look at the labelled information. The reporting requirement, on the other hand, might well create even more bureaucratic effort, especially for smaller companies, taking a toll on time and costs.

The microplastics restriction proposal document can be downloaded from the ECHA website. ■

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

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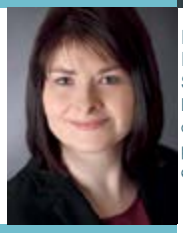

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