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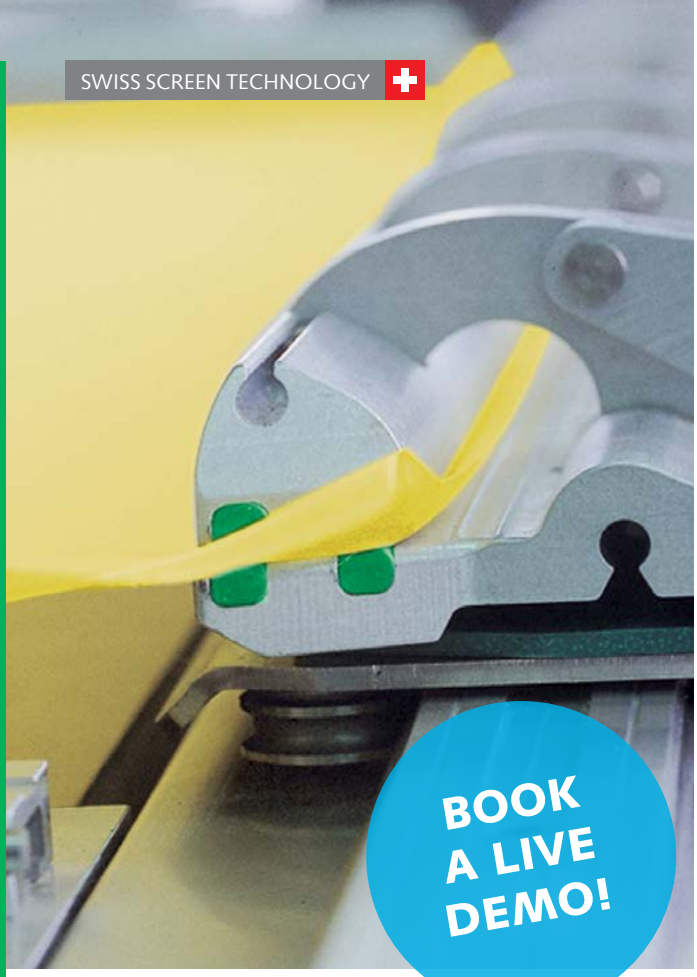

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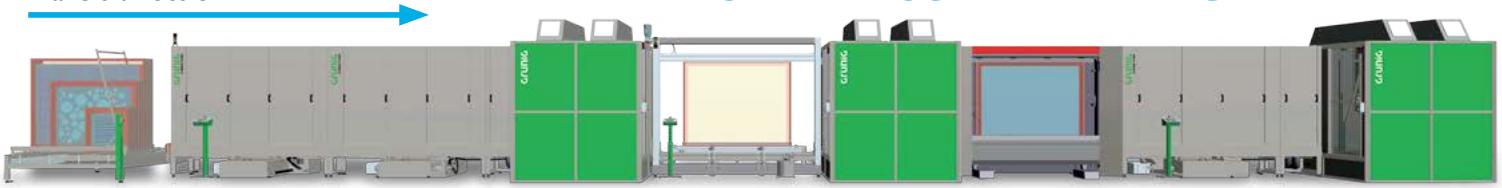

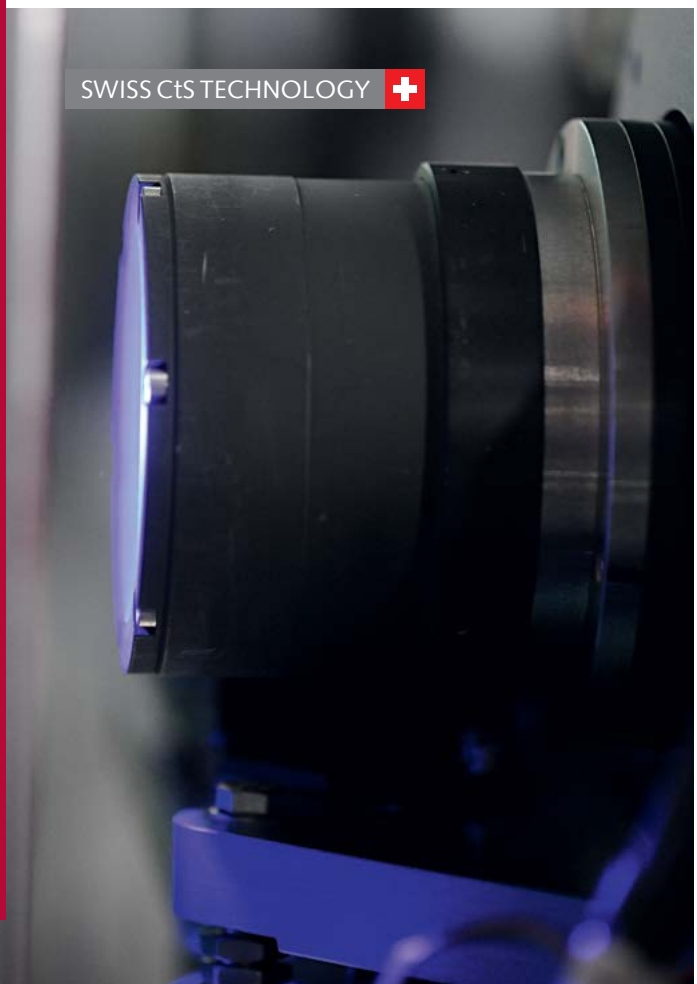

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SPECIALIST printing WORLDWIDE

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

Dear reader,
We welcome the challenges of 2021 with open arms and are ready for a positive year ahead.

We are determined to do all we can to help our industry continue to grow and have some exciting news to share with you!

Following the great support we have received from the suppliers in our industry, we will be able to share our technical content area on our website free of charge. Please go to specialistprinting.com and subscribe for free to access to all our features and resources. This includes over 650 technical articles with intelligent search filters to help you find the information you need. Please take a look.

Readers are enjoying our news section on our website so much that we have decided to launch a monthly round-up of the latest specialist printing news. Our monthly newsletter will launch in March, sharing quick links to any news item you may like to read in more detail.

Please enjoy reading this issue and we wish you and your families health and happiness.

Bryan Collings, Publishing Director

LIVING ON THE EDGE

Interior decoration suppliers are increasingly turning to single-pass inkjet for edge band production. Rita Torfs and Marc Graindourze consider the options, along with the importance of ink choice

Marc Graindourze, Agfa's Business Manager of Industrial Inks

UV inkjet printing is a cost-efficient alternative to gravure printing for edge band production

Many interior trends originate from the world of fashion and thanks to inkjet printing, interior decoration can be as creative and versatile as fashion.

Agfa focuses on integrating inkjet printing in industrial production runs. The company recently launched its 6-colour Altamira Design PID inkset specifically for interior decorative parts. It was mainly developed to print edge bands – saving time and costs – but it is also suited for skirting boards (base plates), panels, window blinds, profiles and even automotive and transportation elements (interior parts of cars, buses, caravans, etc.).

HOW ARE EDGE BANDS CURRENTLY PRODUCED?

In a traditional edge band manufacturing process, polymer granules are extruded into a thin edge band film. Typical surfaces for edge banding are ABS, PP or PVC. During extrusion, a colourant is usually added to obtain a coloured bulk material. Furthermore,

"Every year, new colours and designs are promoted as the new fashion"

a primer is applied to improve adhesion and ink wetting of the ink that will come on top, typically by means of gravure printing (requiring one engraved cylinder for each colour and each design). The printed image is protected by a topcoat, typically a UV varnish.

For an aesthetic effect, a relief can be embossed to depict the wood grain structure. Embossing can also be done prior to printing. The last step is to cut the edge band to size.

Rotogravure printing of edge bands has multiple disadvantages: the need for many basic colours, a stock of cylinders, in addition to limited speed.

DIFFERENTIATION AND COST-EFFICIENCY

One of the advantages of inkjet printing for edge band production is that the analogue gravure method can be replaced by single-pass inkjet. UV inkjet is the preferred option because of its good adhesion on plastics and primers. The benefits of inkjet are many: no stock of cylinders, a fixed set of process colour inks and a shorter preparation time – resulting in more cost-efficient production runs.

In addition, the products can be differentiated and personalised. Every year, new colours and designs are promoted as the new fashion. Using inkjet printing, products such as wallpaper, furniture, floors, panels, skirting etc. can be printed with any design you desire.

Inkjet printing can be used from the design phase and testing to pilot runs and proofing, up to full production printing – all with the same printer and inkset. The production can run at a higher speed and has a smaller footprint. The run length of edge bands is limited, which makes them ideal for single-pass inkjet production printing.

WHY CHOOSE UV INKS FOR EDGE BAND PRINTING?

Agfa's UV single-pass inks deliver several advantages, including adhesion and consistent prints (from beginning to end; left to right). This consistency results from excellent jetting reliability (long open head times, no satellite formation etc.) and batch-to-batch constancy. Extensive testing has been carried out for the new inkset. The reliability of single-pass printing has been proven in production run lengths (i.e. printing for four hours without maintenance) with no missing or failing nozzles.

During the ink development process, the focus was on meeting the specific needs of the edge banding applications. To that purpose, Agfa used know-how that is

Rita Torfs and Marc Graindourze at a 2019 ink conference

integrated into multiple patents, including patents specific to edge band printing.

Agfa's Altamira Design PID inkset complies with Ikea regulations, which include IOS-MAT066 (surface coatings and coverings) and IOS-MAT010 (chemical compounds and substances) as the strictest regulations related to printing of edge bands.

The new inks have been designed to provide a full process fit with the furniture band manufacturing process. For each combination of inks, the printed colour is stable very shortly after printing, which makes it possible to continue with the next process steps right away. The ink consistency allows repeated printing of the same design.

METAMERIC MATCHING AND COLOUR CONSTANCY

Why a 6-colour inkset? Next to the CMYK inks, the Agfa inkset comprises two colours specifically for wood designs. For 'wood grain designs', all wood colours can be obtained by combining the wood-red and wood-yellow inks with black and cyan inks. For standard designs, natural stone, concrete look and other fashion colours, the 4-colour approach with CMYK will deliver the best option because of its wide colour gamut.

Check the colour of your interior in daylight, or under different sources of room lighting; does it look the same?

When two items (e.g. a table top and an edge band) have the same design, but are printed with a different technology, their colours might look different under various light sources (e.g. fluorescent light or an incandescent lamp). This is called metamerism.

Moreover, the colours of a single printed design may also be perceived as different colours when they are examined under different light sources. This is known as colour inconstancy.

By tuning the ink, both issues can be avoided. Pigment selection is the key factor here. Agfa's Altamira Design PID inkset is designed to deliver less metamerism and lower colour inconstancy values for all typical wood designs compared to standard (general purpose) UV inksets with a high colour gamut. The wood-yellow and wood-red colour inks limit colour inconstancy and metamerism compared to the printed 'top plate'. A further reduction of both features is obtained by optimising bulk colouring of the substrate and using a primer in combination with the inks.

"The run length of edge bands is limited, which makes them ideal for single-pass inkjet production printing"

MAKING THE MOVE TO INKJET

Edge band printing is a compelling case for switching from an analogue printing technology to single-pass inkjet. For production run lengths, both the higher speed versus gravure printing and the high design flexibility are very attractive.

The ink's performance forms a key element of the printing solution. Edge band printing requires a dedicated inkset. With Altamira Design PID, Agfa has developed an inkset that meets all the application requirements, delivers consistent print results and enables interior decoration manufacturers to enjoy all the advantages of digital printing. ■

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ANOTHER SIDE TO 3D

UV inkjet 3D printing focusses on the digital manufacturing of objects that cannot be produced by other 3D printing techniques or conventional manufacturing methods. Marin Steenackers explores its potential

Marin Steenackers is Project Manager at ChemStream

Over the last decade, 3D printing technologies such as fused deposition modelling (FDM), laser sintering (LS), and stereolithografie (SLA) have been developed for the manufacturing of prototypes (rapid prototyping), as well as finished products (digital additive manufacturing). Objects are usually printed with one single material, leading to the creation of products with one single set of material properties. A relatively young and strongly innovative branch within the 3D printing technology is UV inkjet 3D printing.

APPLICATIONS

Due to features such as high resolution and the possibility of producing multi-material objects, UV inkjet 3D printing technology has a huge growth potential with a focus on digital additive manufacturing. Furthermore, inkjet 3D printing is a highly productive digital additive manufacturing technology, which makes it applicable for industrial mass production. This was demonstrated at Formnext 2019, where German company DP Polar presented its circular AMpolar i2 3D inkjet printer with a 2m² build area, 700-litre build volume and a printed parts output of 10l/h.

Besides the ability to create a desired product, 3D inkjet printing is a versatile and flexible production method for small to medium-size production batches and allows a smooth integration with other production processes. Due to the high resolution of the inkjet 3D printing process, it is currently the only 3D printing technology that allows the production of objects for optical applications with optically smooth surfaces without the need for (usually complex and expensive) post-processing steps such as varnishing and polishing (see **Figure 1**).

"The incorporation of nanodispersions in 3D-printed objects opens up a broad range of new material properties and applications"

By combining different printheads in one single print job, complex objects composed of several interwoven materials with different properties – mechanical (hardness, elasticity, etc.), optical (colour, opacity, refractive index, fluorescent, etc.), electrical (band gap, conductivity, etc.), chemical (hydrophilic/hydrophobic, etc.) and biological activity – can be manufactured. This allows the production of objects for applications in fields such as optics, automotive and bio-medical devices (micro-reactors and lab-on-a-chip).

ChemStream is mainly focusing on applications for which 3D inkjet printing is a unique production process, such as the digital manufacturing of Gradient-index (GRIN) optics or biocompatible multi-material micro-reactors.

HOW DOES IT WORK?

UV inkjet 3D printing uses UV-curable inks which are jetted with high precision (200–2400dpi) as small droplets (3–180-picolitre depending on the printhead technology) onto the substrate (drop-on-demand). The printer consists of one or more printheads, an optional

Continued over

Figure 1: Personalised 3D printed ophthalmic lens printed by Luxexcel with ChemStream optical ink.

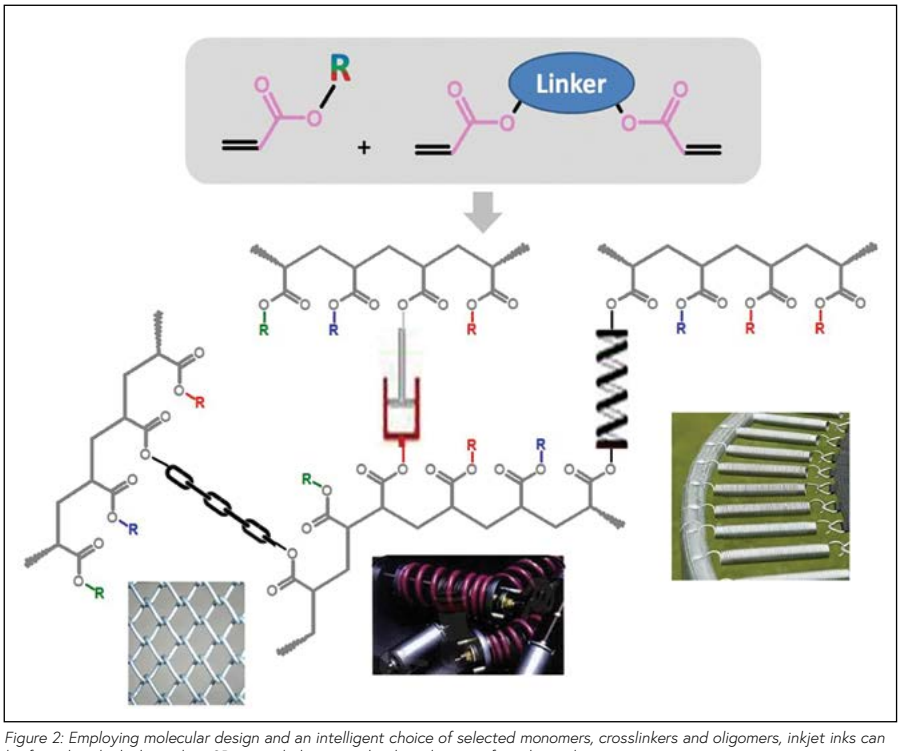

Figure 2: Employing molecular design and an intelligent choice of selected monomers, crosslinkers and oligomers, inkjet inks can be formulated which result in 3D printed objects with a broad range of mechanical properties

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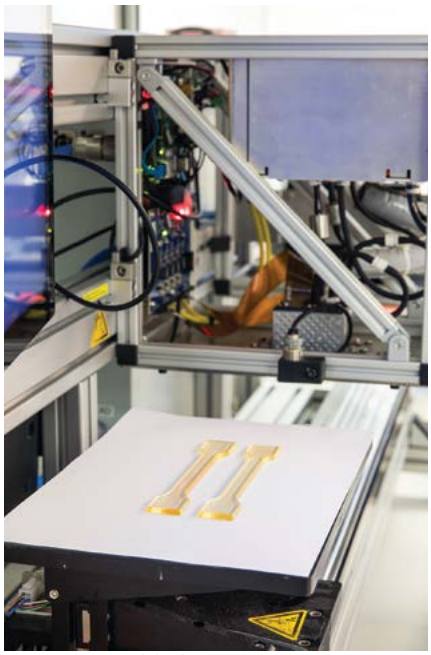

Figure 3: 3D-printed dog bones

Figure 4: A modular 3D inkjet printing unit from VDW-Consulting. The printer is compatible with a range of industrial printheads such as Xaar, Toshiba-tec, Fuji Dimatix, Ricoh, Konica Minolta and Kyocera

leveller and a UV curing station. After being jetted, the drops can be flattened by a leveller before being cured. Then, the print table lowers down a one-layer thickness before the subsequent ink layer is printed. Similar to conventional graphical 2D inkjet printing (in which a colour image is obtained by jetting different colours simultaneously), inks with different material properties can be 3D-printed simultaneously. In order to increase the productivity for each material, different printheads can be placed in series. The voxel resolution [a voxel represents a single sample, or data point, on a regularly spaced, three-dimensional grid] is determined by different factors such as the drop size, printhead native resolution, multi-pass printing strategies and ink/ink interactions (spreading factor, overprintability, etc.). A lateral resolution of 25x25² microns can be obtained in combination with 3-micron resolution (layer thickness) in the Z-direction/axis.

"ChemStream has developed a water-soluble UV-curable inkjet ink that can be removed with tap water"

MECHANICAL PROPERTIES

With molecular design and an intelligent choice of selected monomers, crosslinkers and oligomers, inkjet inks can be formulated to produce 3D-printed objects with a broad range of mechanical properties. Upon UV-curing, the liquid inkjet inks are polymerised to one crosslinked entity. On a molecular scale, a crosslinked and branched polymeric architecture is formed. The mechanical properties of the crosslinked object are mainly determined by the molecular structure of the chemical groups (R) in the monomers as well as by the linker entities of the crosslinkers (see **Figure 2**).

Some linkers are molecular springs which result macroscopically in elastic materials, while other linkers are chemically rigid compounds which result in very hard materials. Some linkers act as molecular 'bumpers' and form materials with a high impact resistance. These diverse chemical building blocks can be formulated to obtain materials with desired properties (e.g. heat deflection temperature, hardness, elongation at break, tensile strength, E-modulus). Mechanical properties are optimised by consecutive iterations based on a Design of Experiment approach. For such an approach, it is essential to be able to evaluate ISO-normed test samples, such as 3D printed dog bones (see **Figure 3**) with a variety of ink formulations in a reasonable time. For such research, ChemStream uses modular R&D 3D printing units from VDW-Consulting that allow rapid ink changes, the use of a wide range of industrial printheads and determination of the print strategy by adapting the printing and curing process parameters (see **Figure 4**).

Figure 5: Preparation of an inkjet grade nanodispersion in a bead mill using tailor-made dispersing agents

EMBEDDED FUNCTIONALITY AND NANODISPERSIONS

Functional inks are obtained by the addition of specific additives. Depending on the application, the additives can be dissolved (e.g. a fluorescent dye) or dispersed (e.g. a pigment). A broad variety of functionalities (such as electrical conductivity, magnetic, high refractive index, high hardness, etc.) can be obtained by the addition of dispersed particles. For inkjet inks, the addition of high loads of such particles is highly demanding because the inks need to have a limited viscosity and must be jetted through micro-channels (nozzles). Low viscous nanodispersions have been used

with well-controlled particle sizes and narrow particle size distributions. Such nanodispersions can only be obtained by advanced milling technologies in combination with specific dispersing agents (see **Figure 5**). Besides the use of commercial dispersing agents, dedicated tailor-made dispersing agents can be synthesised to transform a broad variety of solids into high quality inkjet-grade nanodispersions. The incorporation of such

"UV inkjet 3D printing opens up possibilities for the material science and digital manufacturing of tomorrow"

nanodispersions in 3D-printed objects opens up a broad range of new material properties and applications. In this perspective, UV inkjet 3D printing focusses on the digital manufacturing of objects that cannot be produced by other 3D printing techniques or conventional manufacturing methods.

SUPPORT INK

In order to print complex geometries, a support ink that can be removed after the print job is required. Different support inks for inkjet 3D printing are commercially available. Most support inks are phase-change inks, in which a solid wax is jetted above its melting temperature or UV-curable inks that can be hydrolysed after curing in an alkaline bath. With both options, it is practically impossible to create very narrow channels since the support ink cannot be removed easily or in such extreme conditions (e.g. alkaline solutions at high temperature) that the object material deteriorates.

ChemStream has developed a water soluble UV-curable inkjet ink which can be removed rapidly in normal tap water. This support ink technology, in combination with advanced printing strategies, forms the basis for the manufacturing of micro-fluidic channels which are mandatory for high end bioreactors, microreactors and microfluidic mixers (see **Figure 6**).

WHAT THE FUTURE BRINGS

The translation of continuously new material requirements into industrially applicable 3D inkjet inks is a fascinating multidisciplinary research field. The realisation of new challenges is not only feasible by the design and synthesis of new molecular ingredients and advanced formulation technology, but also by developing new printing strategies and digital manufacturing processes. In parallel, much can also be gained by further developments of new printheads (higher viscosities, higher temperature, smaller drops, hybrid printheads) and printing robots as well as hybrid manufacturing processes. These developments allow the exploration of new material concepts. Although still in its infancy, UV inkjet 3D printing opens up a broad new variety of possibilities for the material science and digital manufacturing of tomorrow.

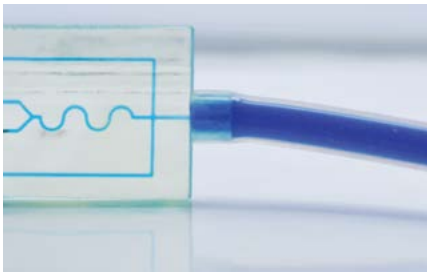

Figure 6: 3D-printed microfluidic channels for high end bioreactors, microreactors and microfluidic mixers

Chemstream will be attending INPRINT Münich on 22–24 June. Come and find them at Stand 417, Hall B5. ■

Marin Steenackers is Project Manager at ChemStream

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Offering ¾ automation, the EFI Vutek h5 hybrid roll/flatbed printer is one of EFI's production inkjet printing solutions for the super-high-speed market

SIGN OF SUPERIORITY

A new generation of super-high-speed digital printing devices could accelerate an analogue-to-digital transition for producers of signs and display graphics, believes Ken Hanulec

Ken Hanulec is Vice President Worldwide Marketing at EFI

One of the advantages many analogue manufacturing processes have over digital equivalents is speed, but a clear disadvantage is the cost model – most analogue processes require long set-up times and are not cost-efficient for the low volume and customised production that customers increasingly demand to optimise their marketing spend.

On the digital side, net throughput – speed minus production make-readies, etc. – has historically been one of the shortfalls. Although digital production of signs and display graphics enables the provider to profitably produce smaller runs, even down to a quantity of one, with insufficient speeds, these digital technologies cannot displace significant percentages of product produced using analogue technologies – such as rotary screen printing or offset.

But all of that changes with the entry into the market of super-high-speed digital printing devices that can deliver equivalent or better quality than analogue at speeds and costs that change the cross-over point between analogue and digital from a price/performance perspective. At the same time, these digital devices allow operators to also cost-effectively produce the shorter runs and versioned content that brands increasingly are demanding, all on one device for the ultimate in production flexibility.

The key is bringing total cost of ownership (TCO) of digital devices in line with that of analogue devices. But in considering TCO, it is not enough to simply factor in the printing device and consumables. It is important to look at the entire workflow from a platform perspective. By that we mean, what are the steps required to get from file to finished product, how much labour is involved, what type of waste is created during makeready, how long it takes to set a press up and what needs to be done to change over from one job to the next.

CHANGING TECHNOLOGY

We've been having these discussions for years now, but what has changed as we move into 2021 is the imminent availability of a new generation of super-high-speed digital printing devices combined with streamlined workflows and automation that are competitively positioned with

"2.5 billion square metres of production is in the crosshairs for conversion to digital"

traditional analogue production processes from a TCO perspective, even for quite long runs.

First, let's take a look at some of the technology changes in the printer that make this transformation possible. To be clear, there is likely to be a need for analogue printing technologies for certain

types of applications for the foreseeable future. But as digital continues to improve, its share will also grow.

According to recent data from I.T. Strategies, the global total signage and display market produces 6.4 billion square metres of product per year. Of that, 61% is already digital, but that leaves 39% currently produced using screen printing or other analogue technologies. That would equate to some 2.5 billion square metres of production that is in the crosshairs for conversion to digital.

"Super-high-speed digital printing devices can deliver equivalent or better quality than analogue from a price/performance perspective"

There are several emerging technological improvements in the digital printing arena for signs and display graphics that are set to accelerate this transition, including:

- Smaller drop sizes for inks, that when combined with superior dot placement delivering near-litho quality with a 5pl drop size. This not only improves quality, but it reduces the amount of ink required to achieve a high-quality image.
- Hybrid curing technology that uses UV LED curing to 'pin' the image in place while taking advantage of a second inline stage of mercury arc curing for more flexibility and durability on the final cure.
- New vacuum systems that hold substrates in place, even if they are not completely flat, such as corrugated. Stronger vacuum pressure means the substrate stays locked in place during printing without the need for material edge guides. This improved hold-down enables the printer to handle a wide range of material, including BC corrugated board with up to a 12mm edge or centre warp.
- The ability to handle a wide range of materials up to 12mm in thickness and 8kg sheets, while also being able to manage material as thin as 120gsm litho stock.
- Up to three lanes of printing enable the printing of more finished boards per hour, with the same or different images.
- The option to use very large rolls of media, or two rolls at the same time. High precision servo driven motion ensures smooth and precise material movement through the printer at up to 350m in 1.25 seconds. Larger rolls mean fewer stoppages to change out media.
- Improved ink circulation technologies that significantly reduce ink wastage and provide greater ink yield with up to 30% to 50% increase over previous technologies. This can translate to printing more than 139m^2 of material per litre of ink with four-colour greyscale printing.
- Automation options, including pallet-to-pallet automated material handling that can result in the production of more than 375 boards per hour with minimal manual labour.

"A new generation of digital printing is poised to move an increased amount of volume from analogue to digital"

These are all machine improvements that are coming online now with new super-high-speed digital printers.

SPEEDY SOLUTIONS

EFI in particular has developed three such solutions: the EFI Vutek h5 hybrid roll/flatbed printer with ¾ automation, a new Vutek super-high-speed printer – the company's fastest multi-pass/shuttle-based hybrid roll/flatbed printer – and an advanced, single-pass Nozomi display graphics printer that leverages the proven technologies and advancements shown in the corrugated packaging market with EFI's market-leading Nozomi platform.

Achieving the best performance and lowest total cost of ownership requires more than just placing a printer in your establishment. It requires an examination of the entire file-to-finished-product workflow. Here are some examples that are important to consider:

In the analogue world, makeready can be extended due to the need to prepare screens and make sure colour is accurate. With digital printing, this work can be done in the digital front end (DFE) before even one drop of ink is placed on substrate. For example, with EFI's Fiery DFE, integrated colour management software gives digital print producers the ability to get colour right every time. EFI Fiery Edge colour profiling technology delivers out-of-the-box print quality and colour improvements in new Fiery DFEs. Plus, a host of new colour controls can tune colour to meet customer preferences, such as features to intelligently boost colour and adjust shadow detail levels.

EFI's super-high-speed printers also feature full integration with EFI software solutions, such as e-commerce storefronts for job submission and MIS/ERP solutions for business and production management.

In addition, newly available, cloud-based applications provide real-time data about the print operation that enable better and faster fact-based decision making. This can include dashboards for monitoring printer status, access to historical data in an interactive environment to transform print production data into actionable analytics, and robust notifications so nothing falls through the cracks in a fast-past digital environment.

All of this adds up to a new generation of digital printing that is poised to move an increased amount of volume from analogue to digital, with the lowest digital TCO on the market, and the benefits of shorter cycle times, less waste and labour cost, and a more sustainable production footprint. ■

Footnote: Vutek is a registered trademark of EFI

Ken Hanulec is Vice President Worldwide Marketing at EFI

EFI's new Vutek super-high-speed printer is the company's fastest multi-pass/shuttle-based hybrid roll/flatbed printer

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A PRESSING MATTER

Maaike de Jong examines the process of using heat press calenders for dye sublimation transfer printing, and offers advice on choosing the correct machine to suit your textile production needs

Sublimation is the transition of a solid product into gas. During dye sublimation the solid dye (ink) evaporates by heat; the ink does not become liquid, but changes immediately into gas. In this way, the dye particles penetrate the substrate immediately.

The dye sublimation process consists of two steps:

1. Graphics are printed onto transfer paper using sublimation inks;
2. The printed graphics are transferred from the paper to the polyester substrate, using a heat press.

This technique is commonly used for fashion and sportwear, signs and banners as well as other items with sublimation-friendly surfaces such as polyester (PES).

DIRECT VS TRANSFER PRINTING

To cater for a variety of printing methods, Dutch manufacturer of industrial rotary thermoprocessing equipment, Klieverik offers heat press calenders for both direct printing (fixation) and transfer printing.

Direct printing means that the ink/pigments are printed straight on the material/substrate. A special coating on the substrate is needed for good deposition of the ink. To create flags, for example, you aim to have a good quality and similar colour on both sides; therefore, a high ink load is needed. Sharp contours of the print, low ink consumption, no need for coating on the fabric and a 100% dye fixation are typical advantages of the direct printing/fixation process.

Transfer printing means there is an intermediate step and material involved: the transfer paper. The design is printed on the paper and by the use of the sublimation process, the particles are transferred onto the polyester substrate. A benefit of transfer printing over direct printing is that it is even possible to print stretchy materials like jersey fabrics for sportwear.

"Using a communication module the Vertex can inform the owner and Klieverik Service that a technical incident has occurred"

CHOOSING THE RIGHT MACHINE SIZE

The size of the printer and calender you require will be determined by the product you would like to create. There is a range of working widths available in the market, from 1650mm or 1800mm (typically fashion), to 3200mm and even 5000mm width, mostly used for the signage market.

Furthermore, the drum size is important: the larger the drum, the higher the output you can achieve. Of course you can adjust temperature, dwell time and pressure, depending on the result you are after.

THE IMPORTANCE OF CONSTANT HEATING

An important factor in the process is the temperature, which should be constant throughout the process – the width as well as the production run. The drum of a Klieverik calender will always be completely filled with thermal oil. The heating elements are evenly distributed throughout the drum to ensure a perfectly controlled temperature.

ON-DEMAND PRINTING

The future of apparel manufacturing is on-demand production. In the traditional method a large amount of the same items are produced, which often results in many unsold items that are then destroyed. This is bad for the environment and it is a waste of a company's resources. Producing smaller amounts for (still) affordable prices avoids these risks. The garment will be ordered and paid for in advance, and will be produced on-demand. The environmental footprint is smaller; there are no minimums; you could easily change your collection and you don't need a large inventory.

A MICRO-FACTORY WOULD CONSIST OF:

- Design: the designs are created on a computer, using special software.
- Printing: the designs are sent to a printer and printed onto transfer paper using sublimation inks.
- Transfer Printing on a calender: the design is transferred to the substrate by means

Designed as an entry-level machine, Klieverik's Vertex hybrid transfer calender offers single-piece transfer and roll-to-roll printing

of dye sublimation transfer printing on a heat press calender.
- Cutting: a cutting machine will cut the fabric into the right forms and sizes.
- Sewing/Stitching: using a stitching / sewing machine, you can assemble the final product.

ROLL-TO-ROLL VS SINGLE PIECE PRINTING

If you need a larger volume (roll) of textile to be printed, you use a roll-to-roll machine. In this case you enter rolls of printed material and rolls of textile into the calender, so the print is transferred from one roll onto the other.

If you want to print smaller, individual objects, such as sports shirts, mouse pads, face masks, etc., a single-piece machine is the preferred option. It is equipped with a table on which you can place the cut materials on the printed paper, after which the print in the calender is transferred to the material. The printed materials then fall into the bin behind the machine. If you want to increase the speed, a longer table and a large drum diameter is the solution.

If you require both processes, a hybrid machine provides a solution. This can be typically be done on the single pieces' execution with added roll-to-toll capacity. An entry-level machine is especially attractive for smaller or starting companies.

VERSATILITY OF THE VERTEX

The Vertex was designed by Klieverik as an entry-level machine for efficient single-piece transfer printing. But the calender is also able to print from roll to roll. It also offers precise edge definition from a compact design with an oil-filled heating drum.

The machine has been optimised for easy operation and is suitable for all types of PES textiles such as sports shirts, masks, mouse pads and much more. Blanks are placed on the feed table and continuously transported with the printed paper to the front of the calender. From here printed pieces can be removed from a box below.

It is also possible to use the Vertex to make a transfer print on roll goods, or for the fixation of directly printed textiles. With a working width of 1650mm, it virtually covers the usual commercial formats of textiles and paper. The 200mm diameter heating roller is ideally suited for a print shop offering a wide range of articles it would like to produce on site.

The tension for both paper and textiles is adjusted with the help of air pressure. A compact touchscreen panel enables easy control. The control also monitors the operating hours and indicates when the next maintenance work is due to avoid unpleasant surprises and high costs. This modern control system is also prepared for remote monitoring and diagnostics – certainly a novelty for a machine in this class. Using a communication module the Vertex can inform the owner and Klieverik Service via the internet that a technical incident has occurred and advise on what needs to be done next. This K-connect service module will soon be available for all Klieverik calenders.

The Vertex is a typical Klieverik machine: a robust construction that offers a long service life with low operating costs and an effective oil-based heating system for very high temperature resistance. Its size and capacity are ideal for print shops that want to take charge of their own production without compromising on quality.

At the same time, the machine is future-proof because it is equipped with a modern control system and enables a connection to the Internet. ■

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PRIMED FOR PIGMENT

Digital printing using pigments keeps the trillion-dollar textile industry in suspense – but when does it take off? The key is to keep a close eye on business pragmatists, advises Helmuth Haas

Patience, according to oil tycoon Paul Getty, is the greatest business asset (although fluency in Arabic might have been equally important for becoming the richest man alive at the time). In digital printing though, patience seems to be an essential virtue.

Pigments and textiles have been in a love-hate relationship for decades – digital printing simply adding a new chapter to it. The operational benefit of using pigments for digital printing seems straightforward. Print reliability also meets the industry requirement and overall print results match the demands of many textile segments. Still, insiders keep a lookout for the mainstream market to adopt.

SPOONFLOWER – THE EARLY ADOPTER

Business pragmatists who are in the majority might not easily be thrilled by some new technology nor by a revolutionary vision. More important to them is reasonable risk management using a fair amount of unbiased data – and this took its time for digital pigment printing. Back in the early 2000s when the first digital pigment printers appeared, most of the textile pragmatists had their cautious approach affirmed. Even visionaries like Gart Davis from Spoonflower [an on-demand, digital printing company based in Berlin that prints custom fabric, wallpaper, and gift wrap] waited until 2013 to invest in an industrial roll-to-roll digital pigment printer. When Durst presented its high-end pigment printer at ITMA 2015, everyone in the industry was closely watching Spoonflower, the most experienced early adopter. Much to the delight of Durst, Spoonflower finally placed the order in 2017.

Digital pigment printing on polyester fabric without primer (left) and with CHT's Tubijet primer (right)

E-COMMERCE BEING THE BEACHHEAD

In short, a beachhead strategy focuses on winning one market segment before moving on to the next. The significance of Spoonflower ordering two more of these high-end printers in 2019 cannot be emphasised enough. Durst not only seems to have a viable pigment printer for the e-commerce business but there was also a crucial difference in primer application technology: instead of jetting the primer, Durst decided to use established padding technology. While a padder is a standard equipment for every textile mill, it meant that e-commerce businesses like Spoonflower had to ask their fabric supplier to perform this additional step up front. Like going from offset paper to digital paper, this required some effort, but the overall performance gain seemed to justify it.

THE NEW LOVE-HATE RELATIONSHIP OF INKJET

You won't find many people who have an unconditional love for primers – the inkjet precoat needed to show an impressive performance gain such as enhancing colour or improving wash-fastness of the textile. What the primer technology is capable of is

Digital pigment printing on polyester/cotton fabrics without primer (left) and with Tubijet primer from CHT (right)

illustrated in this article. Each of the prints opposite were made on the same fabric with the same profile. The only difference is that the sharper one was coated with the Tubijet primer from CHT prior to printing. Back in 2015 when Durst and CHT developed a complete primer portfolio for various substrates there was considerable doubt over whether e-commerce would adopt the process, however this additional step up front seems to pose no obstacle to e-commerce businesses nowadays. Even without strong textile heritage, e-commerce businesses like Probo, Lillestoff or CottonBee were able to implement this step with their existing fabric suppliers fairly quickly.

"When Durst presented its high-end pigment printer at ITMA 2015, everyone in the industry was closely watching"

ARE WE THERE YET?

Repeated machine orders from a visionary company like Spoonflower might prove that pigment is a suitable technology for the e-commerce niche. Assuming that this is the kick-off for the rest of the vast textile industry to adopt though seems farfetched. As with any other technology hype the industry first has to go through various cycles. Being currently 'on the slope of enlightenment' might be a fair assessment since the early adopters seem to be satisfied and more businesses start to benefit from this technology.

CROSSING THE CHASM

Surprisingly, Brazil might be the place where we see some of the first textile companies crossing the chasm. This is even more astounding when looking at the economic challenges Brazil had to face in the past decade. Using the framework of Geoffrey Moore [American organisational theorist, management consultant and author, known for his work 'Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers'], we might interpret the investment of Brazilian textile giant Döhler in a high-speed pigment printer at the end of 2019 as one of the crucial signals we all have been waiting for. If there is anything that outsiders and suppliers can attribute to this 140-year-old company then it is their business pragmatism – firm but fair. On top of that, managing capital expense wisely in any vertically integrated textile mill with its vast machinery is even more crucial for its cash flow. It is fair to say that such a company minds the gap – and makes sure to shed light on all the uncertainties that come with a new technology.

THE BLUEPRINT TO DÖHLER'S SUCCESS

Home textiles specialist Döhler has in-depth knowledge of successfully producing cotton/polyester blends using conventional technology. Even though, printing pigments digitally seems like the obvious next step, Döhler took it to a whole new level. Starting at fibre selection, weaving patterns, bleaching conditions as well as primer recipes, print profile adjustment and curing conditions – everything in production was looked at.

WHAT MADE THE DIFFERENCE?

The most tragic thing for digital printing is when it is simply used for replacing rotary printing. Döhler is a prime example for a company that did exactly the opposite.. It went the crucial extra mile, got its own design team onboard and developed completely new products to offer the Brazilian interior decoration community what this industry had always dreamed of: creativity, agility, choice, responsiveness and quality at drastically reduced minimum order quantities and at a reasonable price point.

AGILITY – THE ENGINE OF FUTURE GROWTH

Looking at pigment primer sales and customer feedback we see that the current Coronavirus pandemic has not slowed down digital printing at all. By contrast, we see signs of acceleration and more attention to a digital mindset. Even though costs for ink, substrate, primer and printer will always count, the past months have dramatically shown us that there is more to the story.

"You won't find many people who have an unconditional love for primers"

In an unpredictable future the ability to adjust daily to ever-changing market demands is key to success. Printing only what you either have already sold or will sell the next day became reality – both for Spoonflower and Döhler. Both of them, the visionary and the pragmatist, serve as beautiful examples of agility to address the uncertainty of our times – by using digital print technology to their advantage. ■

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SEEING THE LIGHT

Automating screen preparation can save time and money. Advocating CTS exposure, Andreas Ferndriger introduces a flexible new LED concept that caters for up to four wave lengths

Andreas Ferndriger is CEO and Owner of SignTronic

For the majority of companies, 2020 – dominated by the global Covid-19 crisis – was demanding and a real challenge. Whilst the number of incoming orders suffered a serious slump, they needed to find a way of keeping the costs under control and reducing them – a juggling act that required an unprecedented amount of flexibility.

In many sectors, this situation made visible the importance of streamlined processes, automation and 'state-of-the-art' technology. Nevertheless, there are still many non-automated areas which, now as before, are burdened with complicated, time-consuming and therefore expensive processes. In the screen printing industry, screen preparation is unfortunately one of the areas where automation has long been neglected.

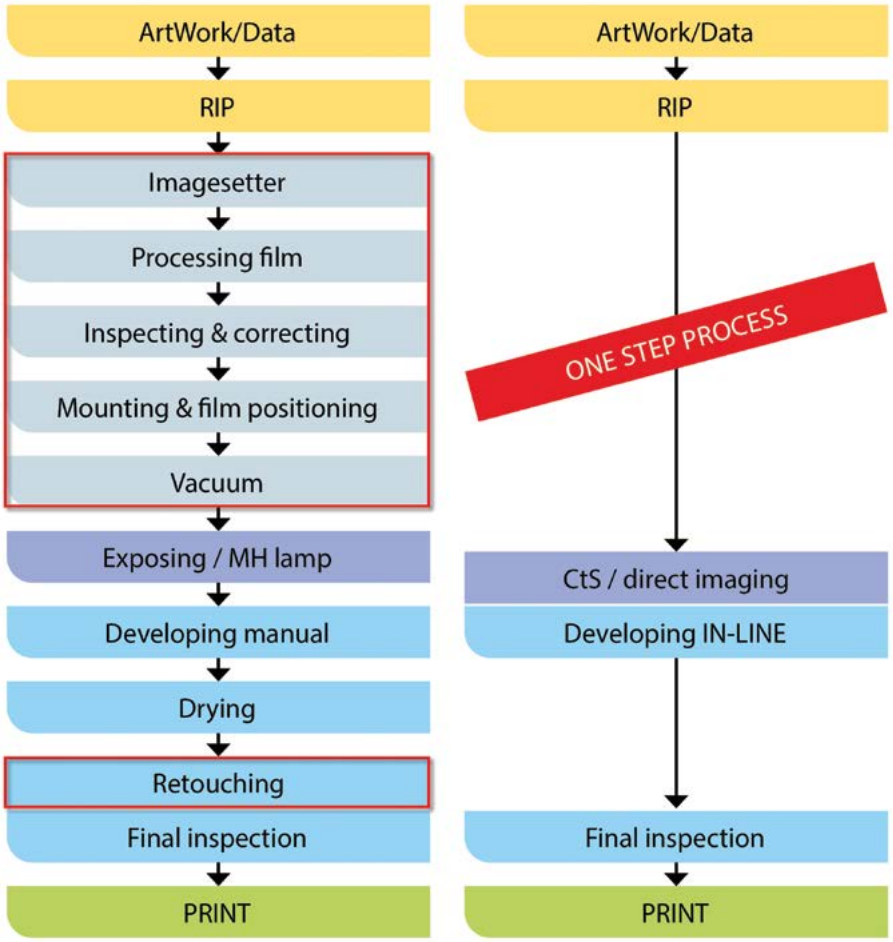
SIMPLIFYING SCREEN PRINTING

The solution approach 'simplify screen printing/screen making!' is no advertising slogan but an absolute imperative in order

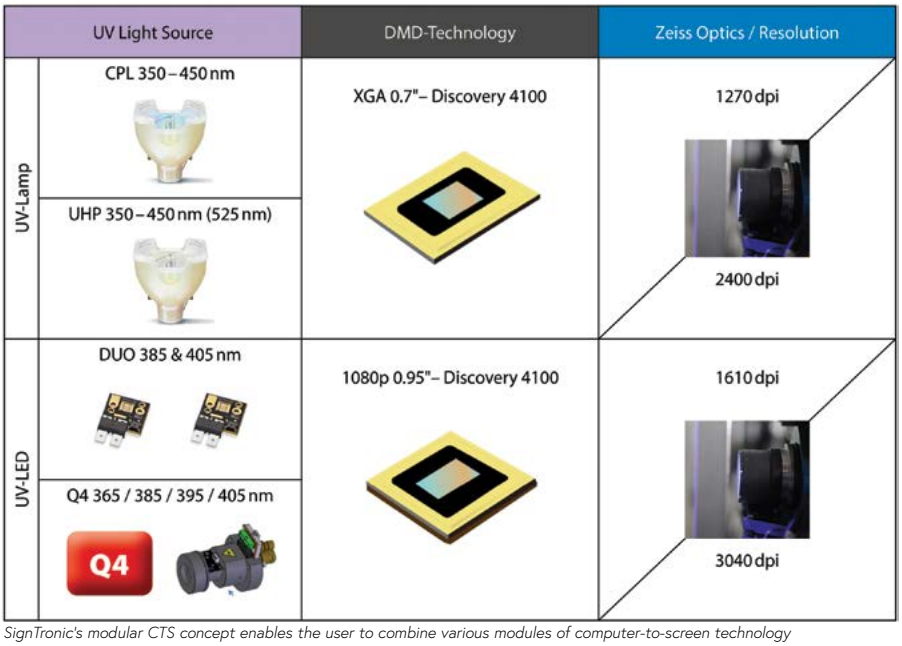
"Using the CTS direct exposure method, several of the process steps required for screen preparation can be deleted without replacement"

to enhance economic efficiency and to follow the trend towards a greater flexibility.

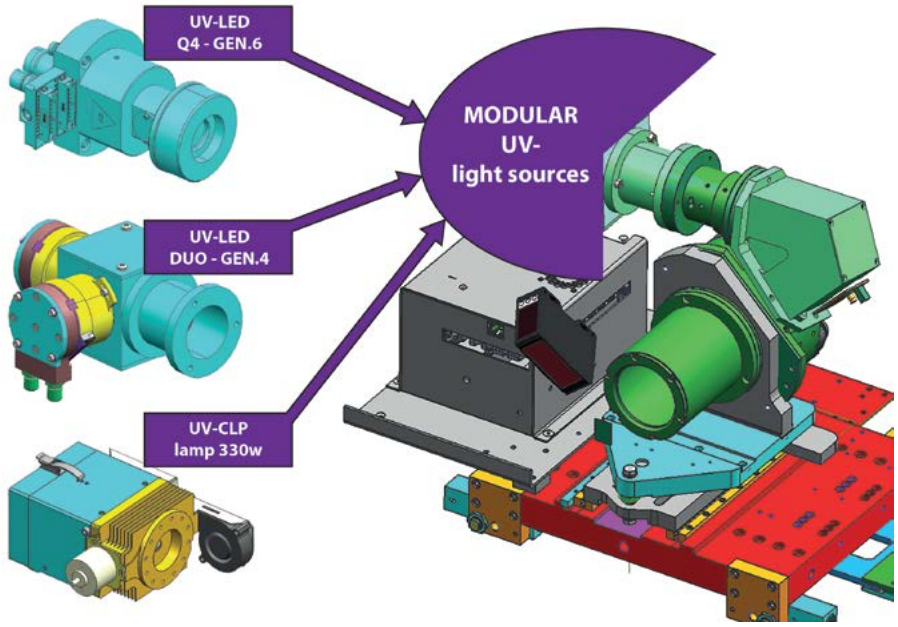
The computer-to-screen (CTS) direct exposure technology enables the user to achieve enormous savings. The traditional method, which consisted of first producing



Overview of the screen-making process with conventional vs CTS direct exposure. This diagram illustrates the differences between the two methods (processes marked in red can be eliminated without replacement)



SignTronic's modular CTS concept enables the user to combine various modules of computer-to-screen technology



The StencilMaster CTS direct exposure unit – one concept; three different UV-light sources

the films and then in copying the material, involved considerable costs for material (film, chemical products, etc.), energy and staff.

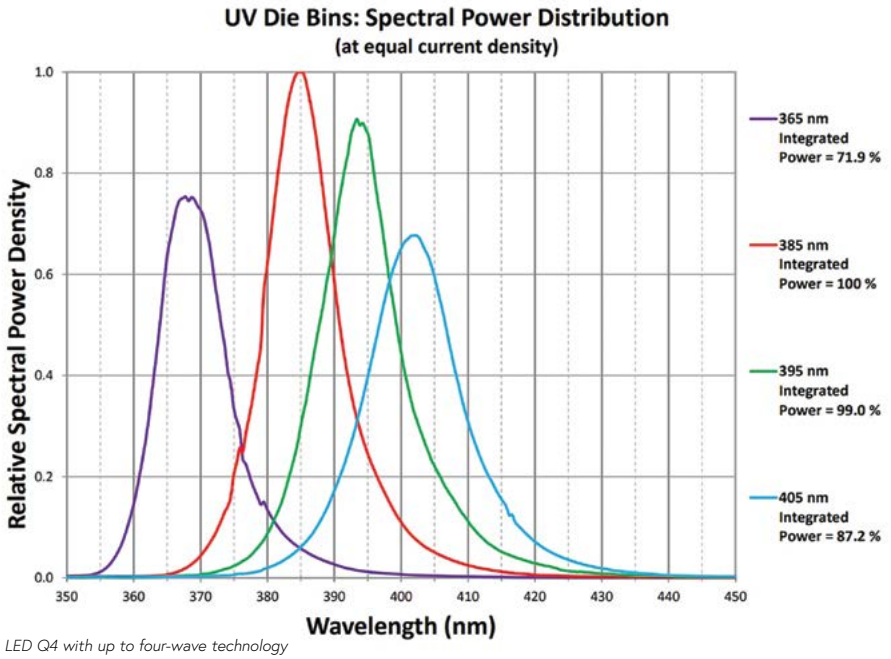
The main advantage of the CTS direct exposure method is the fact that several of the process steps required for screen preparation can be deleted without replacement. This results in reduced personnel expenditures as well as handling costs, an elimination of error sources, lower production costs, shorter reaction times, increased flexibility, reproducible results and – best of all – improved printing quality.

However, the decisive factor here is not just the use of the new CTS direct exposure technology, but also the need to take into account the huge differences and requirements that have to be considered for the various screen printing applications.

MEETING ALL REQUIREMENTS

There is probably no other printing procedure that relies on so many different parameters; the printing screen needs to address a great many requirements. For one thing, there is the wide variety of sizes to be considered, as well as the selection of the mesh itself: polyester (white or yellow), steel mesh, as well as the various gradations between very coarse and extremely fine mesh. This leads us to the next decisive parameter, which concerns the coating material, where the printer has the choice between direct emulsions, capillary films or pre-coated meshes (PCF). Then there are the various raw materials such as Diazo, SBQ/Fotopolymer or DualCure, which function with different wave lengths. This means that the UV light sources need to be adapted to the new exposure system. Desired colour application/ink system and different coating thicknesses also have to be taken into account. For practical purposes, barely any of the alternatives are possible, from almost no emulsion application up to several hundreds of microns EOM (Emulsion Over Mesh).

Continued over



LED Q4 with up to four-wave technology

SUMMARY

A combination of several main parameters results in the required UV light output and therefore the exposure speed per printing screen:

- Type and characteristics of the mesh
- Type and characteristics of the coating
- Coating thickness (overall thickness of mesh and coating EOM)

MODULAR CTS CONCEPT

For these reasons, and in order to offer the optimal solution for all the requirements and wishes, SignTronic has developed the modular CTS concept. This flexible and modular concept enables the user to combine various essential modules of the CTS technology:

- UV light sources in various outputs (watts) and wave lengths (nm)
- DMD micro-mirror chip from TI and different sizes (digital micro-mirror device)
- Zeiss optics and various resolutions of 1270, 1609, 2400 and 3040dpi)

UV-LED Q4

In addition to existing UV light sources (UV-CPL high power lamp and UV-LED DUO), SignTronic is now in a position to offer a new UV-LED light system to be used in combination with the company's StencilMaster Generation 4 CTS direct exposure unit: UV-LED Q4.

Installation of StencilMaster STM-2316 in Austria earlier this year

This powerful and flexible LED concept can be adapted to customers' requirements. In practical terms, this means:

- Equipment for up to max. 4 different wave lengths (365, 385, 395 & 405nm).
- Maximum output comparable to a CPL high-performance lamp.

"SignTronic's new powerful and flexible LED concept can be adapted to customers' requirements"

- Ability to equip all the LEDs with the same wave length (e.g. only 405nm).
- Two sizes for the DMD_4100/0.7 or DMD_9500/0.95, as an option.
- Freely selectable equipment with a maximum of 18 LED (Die Bins) is possible.
- Every wave length can be individually switched on and switched off (which enables the printer to select the adequate wave length in function of the particular coating materials).
- Output of the LED light source is continuously adjustable between 10–100%.
- With a performance of 90%, a minimum life span of 7000hrs can be expected.
- Simple and rapid stand-by operation.
- A closed cooling circuit with water cooling and a powerful chiller is part of the delivery standard.

"Every wave length can be individually switched on and switched off"

- Uncomplicated service and replacement of the UV-LED light source. Every customer is in a position to safely replace the LED assembly themselves, without problems and in a very short time.
- Old LED assemblies are refurbished and can then be reused.

INSTALLATION IN AUSTRIA

At the beginning of 2021 a StencilMaster equipped with the latest UV-LED Q4_FHD with a resolution of 1609dpi and an exposure cover of 30.3mm (more than 2 million micro-mirrors function at the same time) was installed in Austria.

This new system STM-2316 has been designed to cater to screen sizes of up to 1800 x 2800mm and is used by a service provider to handle a wide range of different customer requirements. ■

Andreas Ferndriger is CEO and Owner of SignTronic

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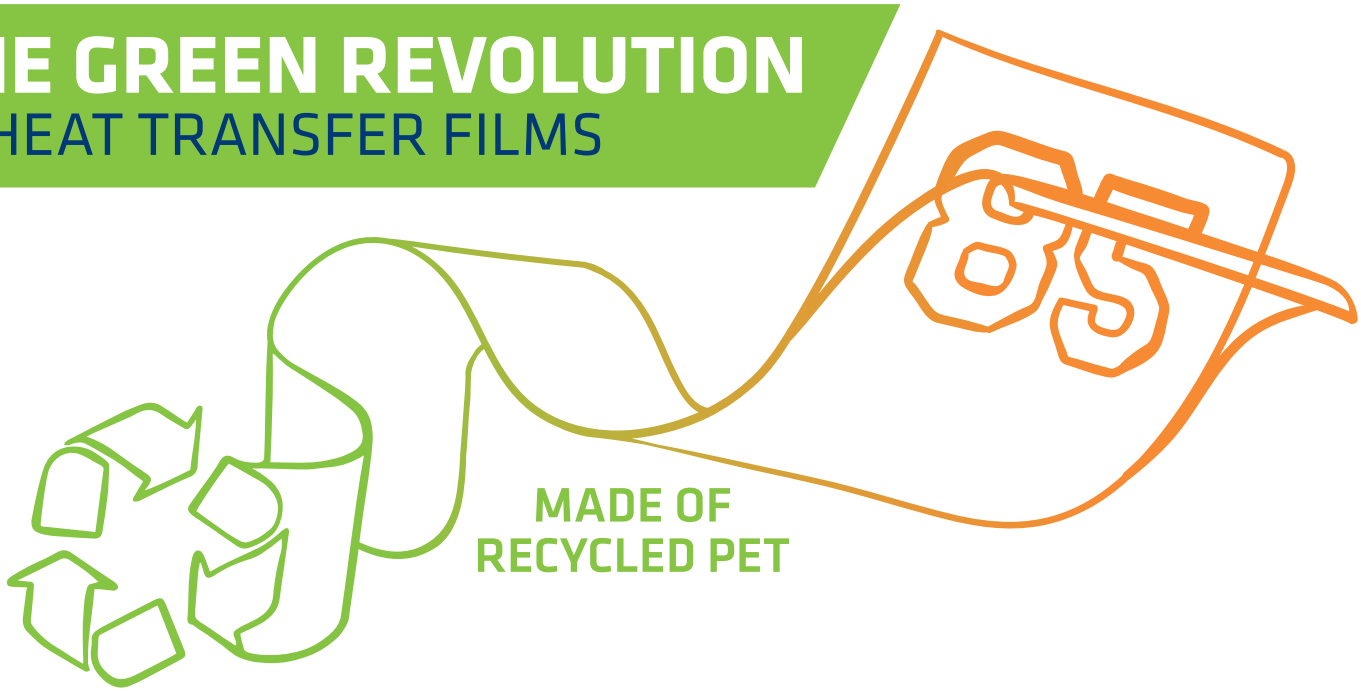

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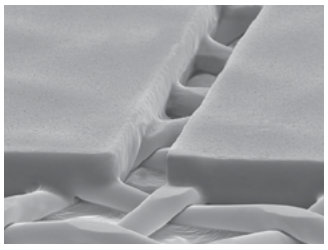

Emulsion with highest resolution

as basis for the screen-printing stencil

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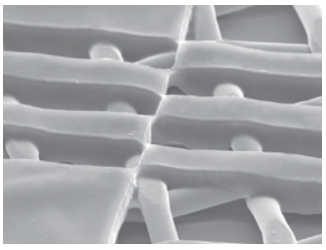

Post coating

for optimizing Rz-value and mechanical resistance

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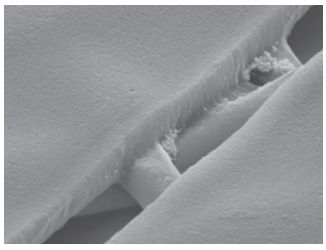

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COVID-19 AND THE FUTURE OF PRINT

Late last year FM Future in partnership with Ricoh Europe conducted a survey to ascertain the tone and opinion of the FuturePrint community in view of the Covid-19 pandemic. Graham Kennedy examines some of the key findings

In October 2020, 139 respondents from 20 countries completed a survey conducted by FM Future in partnership with Ricoh. Respondents come from the FuturePrint Eco-system of print technology, print production and manufacturing sectors. The objective was to gauge the sense of the market, expectations of the impact of change and how the crisis is altering demand and revealing opportunity for digital printing technology

A SENSE OF NORMALITY

2020 was clearly a year of great uncertainty, however by October when the survey was conducted, the majority of respondents had moved into a more resourceful state.

"Only 12% of respondents indicated they have closed their business"

While uncertainty remains, acceptance of this is a new fact of life. Results demonstrate that the majority of respondents agree a sense of normality has returned to business life with 53% answering 'somewhat' and a further 16% saying they have now become accustomed to it.

TACKLING THE CRISIS

Respondents highlight the innovative spirit of the inkjet community with 57% saying that they have adapted to create new demand and solve problems; 38% have added new digital solutions to help to deliver against changing demand.

Only 12% indicated they have closed their business, underlining the community of respondents' innovative DNA, with a natural inclination towards solving new problems.

IMPACT ON INNOVATION

Reassuringly, 51% of respondents report that they are innovating more now than prior to the Covid-19 crisis. Only 6% stated they have suspended their innovation plans, while the remaining 43% state it has impacted on but not halted innovation plans.

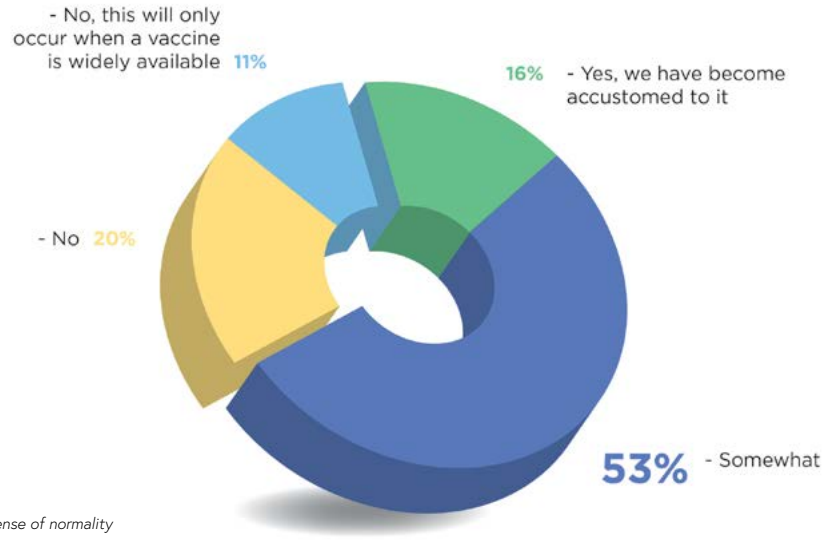
These results underline that respondents are more inclined to work outside of their comfort zone, to continue to drive business forward, solving problems and innovating in the process.

INVESTMENT CHANGES

51% of respondents stated that investment plans have changed with a focus on solving new problems while 31% said that the crisis has not forced them to change their investment plans.

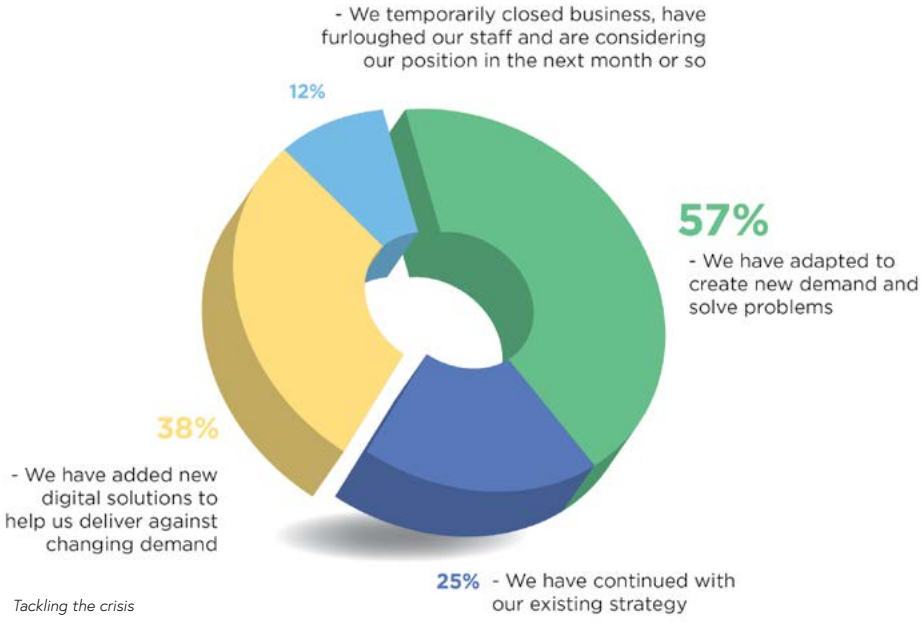
Only 18% believe that investment is now on hold – again demonstrating there is still opportunity to create value despite uncertainty and rapidly changing demand.

In your experience, has some sense of normality returned to business life when compared to April?



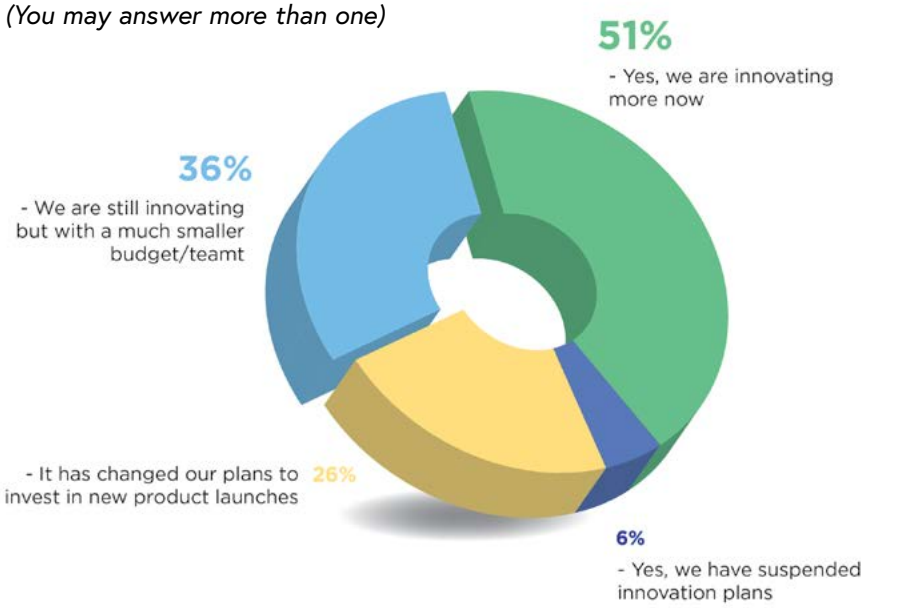
A sense of normality

How have you tackled the crisis? (You may answer more than one)



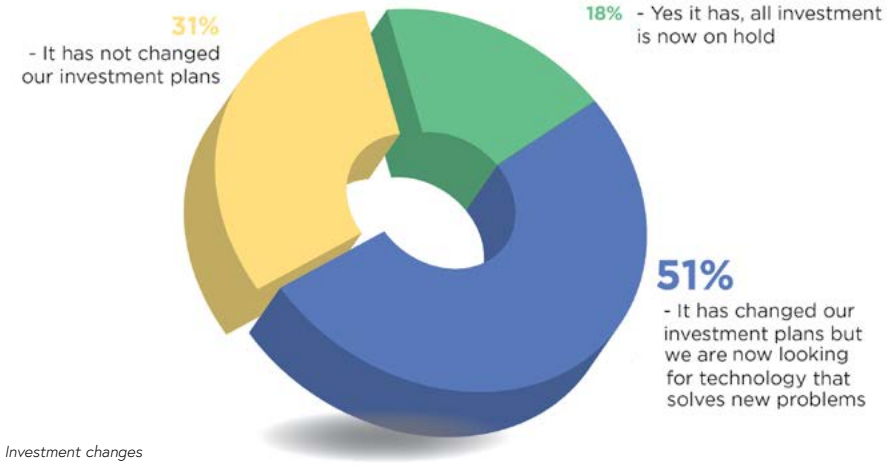
Tackling the crisis

Has the crisis in the past few months affected your innovation plans? (You may answer more than one)



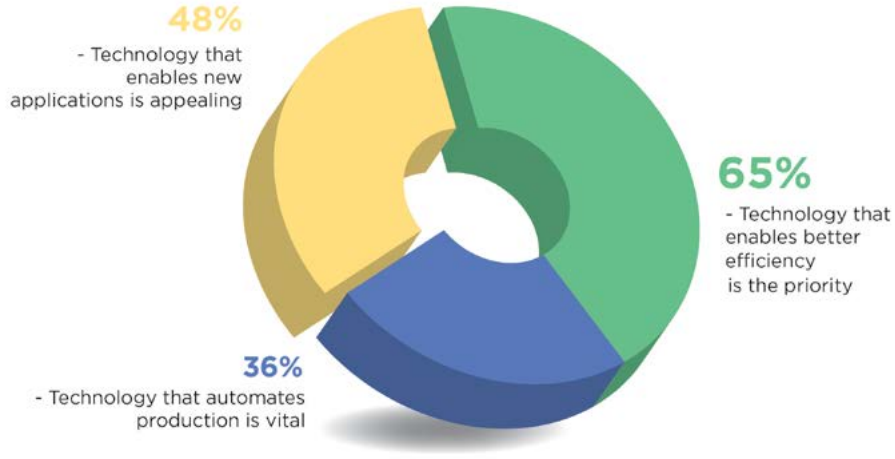
Impact on Innovation

Has COVID-19 affected your plans to invest in new technology?



Investment changes

What is your priority with technology now? (You may answer more than one)



Technology priorities

TECHNOLOGY PRIORITIES

Efficiency is always high on the list of driving factors when acquiring new technology in any market and unsurprisingly the crisis has compounded this, with 65% stating efficiency as their priority.

"Respondents are more inclined to work outside of their comfort zone"

Not far behind, 48%, stated that technology that enables new applications is a key priority underlining that new application potential in new markets has gathered more interest as traditional print sectors struggle in line with reduced demand and shifting priorities.

COLLABORATION AND DIGITAL MANUFACTURING TO SOLVE PROBLEMS

In response to critical issues in supply chain delivery of manufacturing goods into retail stores, according to respondents, collaboration (57%) has been forced to increase to solve these supply problems.

Secondly, respondents expect to see an increase in digital manufacturing investment to help solve future supply problems.

This aligns with a commonly held expectation that manufacturing models will start to decouple from a traditional centralised model with a more decentralised approach where manufacturing is located closer to customers, enabling supply regardless of uncertainty and with product that is best aligned with local demand.

ACCELERATED DEMAND FOR DIGITAL

Growth in digital printing in new industrial sectors has arguably been slow over the past five years pre-Covid. However, the crisis has revealed the traditional supply chains to be inflexible and unable to deliver

"Change has accelerated by 10 years in just 12 months"

against a fast-changing scenario. This has piqued interest in digital inkjet that can empower localised production and solve the problems of today.

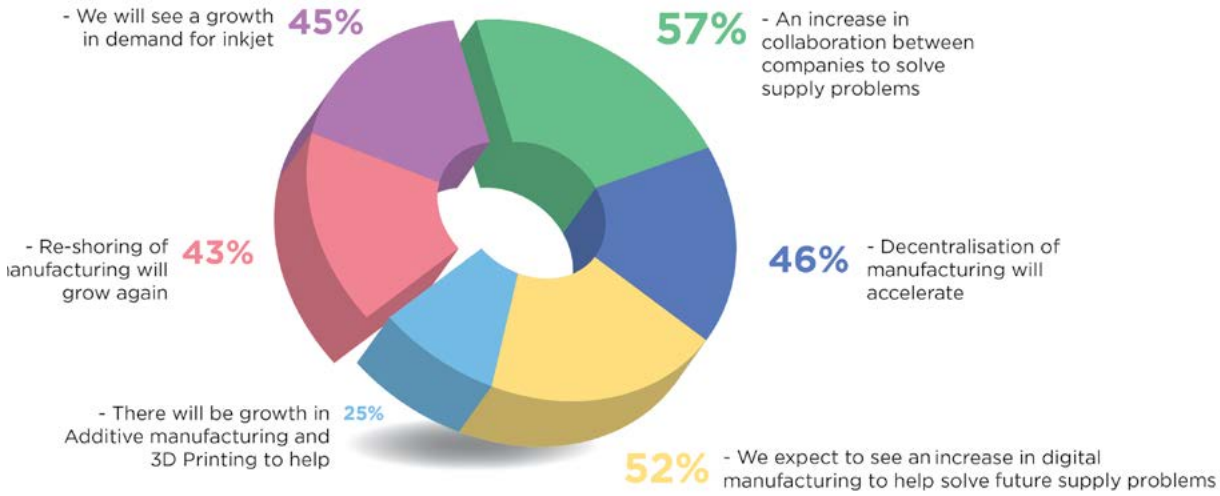
These results also chime with growth in interest for digital manufacturing technologies. Many believe change has accelerated by 10 years in just 12 months. Therefore, the added agility and flexibility along with late-stage customisation inkjet can deliver has greater appeal than ever.

CONCLUSION

While 2020 was a significant challenge, the results indicate a resilient sector with a commitment to innovation by solving new

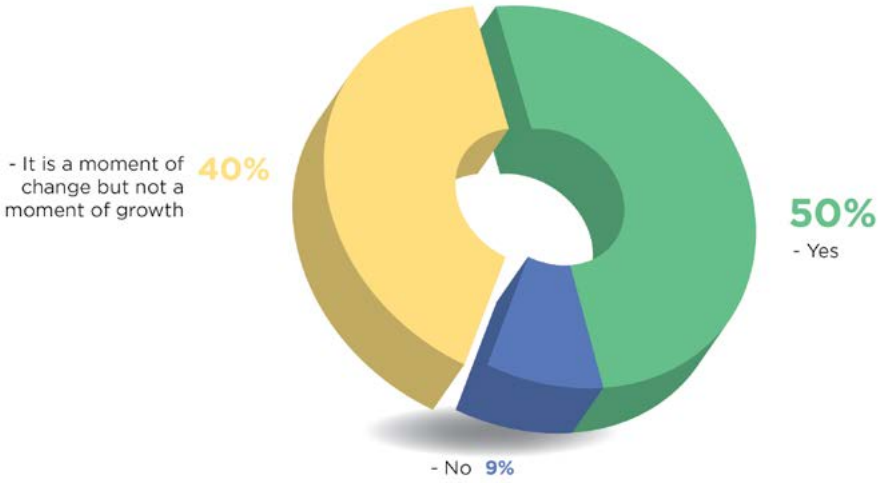
Continued over

Do you think that challenges with the general manufacturing and retail supply chain will lead to any of the following? (You may answer more than one)



Collaboration and digital manufacturing

Do you think this is a watershed moment where digital print technology truly grows into new markets?



Accelerated demand for digital

problems that digital technology is best suited to solve. We expect the first half of 2021 will continue to provide challenges but despite continued uncertainty there is also a significant opportunity for inkjet as interest accelerates. We expect to see a more positive year overall with the second half of the year benefiting from the coverage of vaccines and a relative return to stable trading conditions. ■

For all results of the 'Covid-19 and the Future of Print 21' survey, please visit www.futureprint.tech or email marcus.timson@fmfuturenow.com for a copy.

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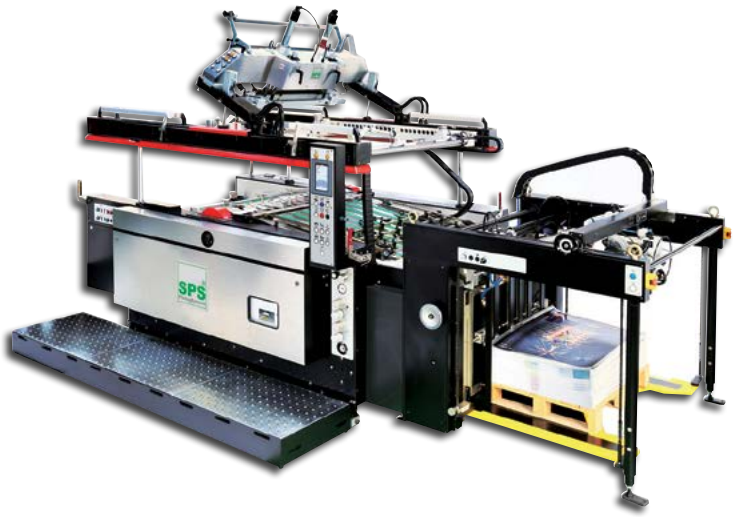

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FACE FIRST

Thanks to Covid-19, face mask wearing has become commonplace. Amid myriad options for customisation, ink choice and compliance are crucial for a covering that comes into close contact with skin, warns Jessica Makrinos

Phone, keys, wallet, mask. It's a new world we are living in and wearing a mask in public has become the norm. With a Covid-19 vaccine now being rolled out, there is hope on the horizon. However, experts say that for the foreseeable future safety protocols still need to be strictly adhered to in order to keep communities safe.

According to a poll from the National Geographic, 74% of people claim they 'always' wear a mask or facial covering, an increase of 13% since August; 92% of people surveyed said they sometimes, often or always wear one.

With the global face mask market expected to exceed $50 billion by 2025, the segment of the printing industry that can meet this demand will also see dramatic growth. Most printing businesses have already begun to adapt their operations to address this market opportunity.

FACING UP TO DEMAND

A face mask is defined by the US Food and Drug Administration as a form of 'personal protective equipment that is used to protect the wearer from airborne particles and from liquid contaminating the face,' commonly in the form of N95 respirators or surgical masks worn by healthcare professionals. Facial coverings are used by the general public and are typically made of polyester or cotton.

Example of inkjet printing on face masks

"Since face masks and coverings come into close contact with skin, guidelines and restrictions are extremely important"

With masks becoming a routine of daily life, many businesses have taken this opportunity to showcase logos, pop culture references and unique designs. For customised face masks and coverings, there are three primary forms of printing: pad printing, digital inkjet printing and sublimation.

Pad printing on face masks

PAD PRINTING

Pad printing is the most flexible printing method of the three. This process enables a company to quickly reproduce one or two colours with images up to 140mm (5.5ins) in diameter. Additionally, there are many inks and possible combinations of hardeners and solvents that will allow a pad print to adhere to practically any substrate from cotton to polyester. Most of these machines are capable of printing roughly 1,200 masks per hour at less than a penny per piece.

DIGITAL PRINTING

Digital or inkjet printing technology is best utilised for full-colour, full-coverage high-quality graphics. Capable of printing on both face masks and facial coverings, UV flatbed printers are ideal for printing large volumes of face coverings simultaneously with a high range of customisation, which lowers production costs. The best applications for this printing method are N95 or surgical masks, as these are typically made out of non-woven fabric and inkjets cannot print on cotton or similar materials.

Mask wearing is likely to become standard practice moving forward

SUBLIMATION

Sublimation is another option for full-colour prints on face masks and coverings; however, it is limited to polyester masks. With sublimation, a special polyester-coated paper is printed with the graphic. Then, the paper is placed on the product and heated to a very high temperature to adhere to the fabric. Because of its more labour-intensive manual workflow, sublimation is a better option for smaller companies that are not printing at a high volume. Sublimation-based heat press machines are available for practically any size business and the consumables are relatively inexpensive.

THE RIGHT INK

While each of these printing options has its benefits and limitations, the ink is an important component to ensure optimal product quality. Properties to look for in any kind of ink for face masks include compliance standards and adhesion. For example, if the UV ink is not flexible in nature then it may crack and stretch when pulled. With pad printing, if the correct ink is not chosen, it may

"The global face mask market is expected to exceed $50 billion by 2025"

come off easily in the wash or it could smudge while printing. For sublimation, not enough heat will cause graphics to peel away.

Aside from adhesion, ink compliance is the most important factor. Since face masks and coverings come into close contact with skin, the same guidelines and restrictions for tagless printing apply here as well. Guidelines set by standards, such as Eco Passport by Oeko-Tex NAMSA Skin Irritation Study, are extremely important.

As society continues to adapt to this new way of life, mask wearing is likely to become standard practice moving forward. Direct-to-mask printers can provide accurate reproduction, fast throughput, and enable printers to add a spark of creativity and originality. ■

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ELECTRIC AVENUE

Electronic manufacturing is opening up new opportunities for screen printers. Dr. Moazzam Ali discusses his aim to demystify and democratise modern technologies that can be produced on standard screen printing machinery

In electronic manufacturing, screen printing is a well-known process. It is extensively used for the production of printed circuit boards (PCB) – the 'base' of all electronic devices. Screen printing is also used for the production of membrane switches, which are present in our household electrical and electronic equipment.

Although screen printing has been commonly used in electronic manufacturing for decades, the printing know-how still belong to an exclusive club of a selected few companies. For traditional screen printers – who are experts of printing techniques, more specifically colour printing – entry into the club is very difficult. This difficulty arises due to extensive use of non-printing production processes in electronic manufacturing. Compared to non-printing production processes, the contribution of screen printing to the complete manufacturing process is very small.

NEW OPPORTUNITIES – AND CHALLENGES

A new technology called printed electronics is emerging in the field of electronics. Through this technology electronic devices can be produced solely by printing techniques. Currently, printed electronics is done by screen printing, inkjet, flexo and rotogravure techniques. Screen printing has an advantage over other printing techniques because it is a low-cost process with a substantial printing speed. That means a new opportunity is appearing for traditional screen printers in the field of electronic manufacturing.

However the entry of traditional screen printers into this new market is not free from barriers, as the technology is still in its nascent stage. The first barrier is related to production know-how of printed electronics, which mainly belongs to a handful of companies who keep it as their trade secrets. That means production know-how is not easily available for printers.

The second barrier arises due to the unavailability of all necessary inks needed for printed electronics. In order to produce printed electronics, a printing company needs access to all the necessary inks and these inks must be compatible to each other. Presently, different inks are manufactured by different companies and as expected these inks are not compatible to each other. Complication increases when the commercially available inks are not suitable for an existing printing setup of a printing company. That means a printing company needs to test different inks from different suppliers to identify a set of suitable inks. Somehow, if the printing company manages to solve ink-related issues, it has to do extensive R&D to develop products by using these inks. These barriers are keeping screen printing companies away from printed electronics.

Figure 1: OLEDs powered by a thin and flexible printed battery for a bottle label

"Saralon has simplified the production of batteries by converting battery materials into inks and printing these inks into a form of thin battery"

LOWERING THE BARRIERS WITH INKTECH BY SARALON

Saralon GmbH, a start-up from Technical University of Chemnitz, has taken up the challenge of lowering these barriers and bringing traditional screen printers into the field of printed electronics. The company not only sells all necessary inks but also provides complete production know-how of printed electronics.

Figure 2: Saralon's latest development in the field of Electroluminescent technology: printed 'light' on paper

Bringing a smartphone close to SaralNFC LightPaper can switch on light from the paper (e.g. here a jewelled earring sparkles into life) and simultaneously open a weblink on the smartphone

Saralon was founded in 2015 with the aim of bringing printed electronics to traditional colour printing companies. Keeping the needs of colour printing companies in mind, the company has developed multiple compatible inks for various printed electronic applications.

Apart from selling inks, Saralon provides production-related training to printing companies to help them produce printed electronic applications. As Saralon has full control over ink development and its production, it can easily adjust its inks according to a particular printing setup. In other words, it is not only selling inks but also doing application-driven R&D for printing companies. Some of the applications that Saralon's inks can produce are described here:

PRINTED BATTERIES AND OLED LABELS

Printed batteries are printed on plastic and on paper. Battery technology is centuries old and batteries are produced by complicated production methods. Saralon has simplified the production of batteries by converting battery materials into inks and printing these inks into a form of thin battery. Saralon's current battery technology is based on Zn-$ZnCl_2$-MnO_2, which is a primary battery. The battery can easily be produced by any screen printing machine and by using seven different inks. These thin and flexible printed batteries can be used in different electronic devices. The example shown in **Figure 1** is a light-emitting bottle label. The label comprises thin and flexible (Organic Light Emitting Diode) OLEDs which are powered by a 6-volt thin and flexible battery. Apart from battery expertise, Saralon provides complete instruction in OLED label production. This means that a label manufacturer does not need to do intensive R&D to develop OLED-based labels.

ILLUMINATING PAPER

Figure 2 shows Saralon's latest development in the field of Electroluminescent (EL) technology. Using this technology a piece of paper can become an illuminated paper. And this is done not by any complicated and expensive machine but by using simple screen printing machines. Here, four different EL inks are printed on a 100gsm paper by a sheet-fed screen printing machine in ambient condition. After that, graphics are printed by an offset printing machine. Connecting the paper to a suitable power source can light up the printed areas. This illuminating paper can be used for multiple applications e.g. boxes, bags, posters, PoS. An additional feature of this light emitting technology is that the paper can be rolled up and can also be bent. A further advantage of paper is that its recyclability and disposability is simpler.

RESPONSIVE PAPER

The impact of NFC technology [near field communication wireless technology] is well established in the present world. Saralon is working to simplify the production of NFC-related products so that printing companies can produce them using existing printing machines. With SaralNFC LightPaper, bringing a smartphone close to the paper can switch on light from the paper and simultaneously open a weblink on the smartphone. Using SaralNFC TouchPaper, once a smartphone is placed on the paper, the paper becomes interactive; multiple weblinks can be opened by touching paper at predefined positions.

Apart from NFC, Saralon is also working on stretchable and wearable electronics, IoT and sensors. Positing itself as a 'one-stop shop for printed electronics', Saralon's aim is to develop the latest technologies and bring them to traditional printing companies, especially screen printers. ■

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PROTECTIVE PACKAGING

The growing use of UV inkjet ink technology for packaging applications requires ink manufacturers to be stringent about consumer safety. Migration-optimised UV inkjet inks could be the answer, according to Dr. Ralf Mueller

Dr. Ralf Mueller is Head of Sales UV Inkjet EMEA at Siegwerk

Digitally printed tubes produced on a Polytype DigiTube press using Siegwerk migration-optimised UV inkjet inks

UV-curable inks are an ideal solution when brilliant, glossy colours as well as flexible and resistive prints are required. This has promoted wide use of UV-curable inks in packaging applications, especially in the narrow web markets. With the development of piezoelectric drop-on-demand inkjet systems for industrial printing, a market transformation from analogue to digital has been initiated. Furthermore, inkjet printing has introduced a new level of freedom by enabling contactless printing of digital high resolution images.

Due to its jetting performance and print stability, UV inkjet has rapidly gained market share in label printing and created new possibilities for label-less decoration of consumer goods by direct-to-object printing. This is why ink manufacturer Siegwerk is convinced that UV inkjet is the best digital print technology for narrow web applications, whilst advocating water-based inkjet technology for large width digital printing on thin polymer films and porous material.

Using UV-curable inks on consumer goods, particularly food products, requires special consideration. After all, it was the concern about the use of ITX photo-initiators in UV inks in 2005 which led to significant changes in awareness around migration of low molecular weight substances from printed layers and accentuation of legal boundaries for food packaging manufacturers.

LEGAL FRAMEWORK

With the growth of UV inkjet ink technology in packaging applications, ink manufacturers need to demonstrate extensive formulation know-how to ensure consumer safety while offering best-in-class ink solutions. Within the European Union, the legal basis concerning consumer health and interests is defined by three regulations:

- European Framework Regulation (EC) No 1935/2004
- Regulation (EC) 2023/2006 on Good Manufacturing Practice
- Regulation (EU) No 10/2011

However, there is currently no specific EU legislation addressing printing inks for food packaging. The 'Swiss Ordinance' in its revised version (quoted as SR 817.023.21) is today the only regulation providing clear boundaries for ink formulations for food packaging. It contains a list of currently 5290 substances classified into Part A (toxicologically evaluated) or Part B (non-evaluated).

Part A substances are listed either with Specific Migration Limits (SMLs) or with a general Overall Migration Limit (OML) of 60ppm [parts per million]. These substances can be used in inks, provided that the migration limits are not exceeded in the final packaging.

Part B substances may only be used if they are not classified as 'CMR' substances (i.e. carcinogenic, mutagenic or reprotoxic according to classes 1A, 1B or 2 of the CLP Regulation) and if their migration is not detectable with a limit of 10ppb [parts per billion].

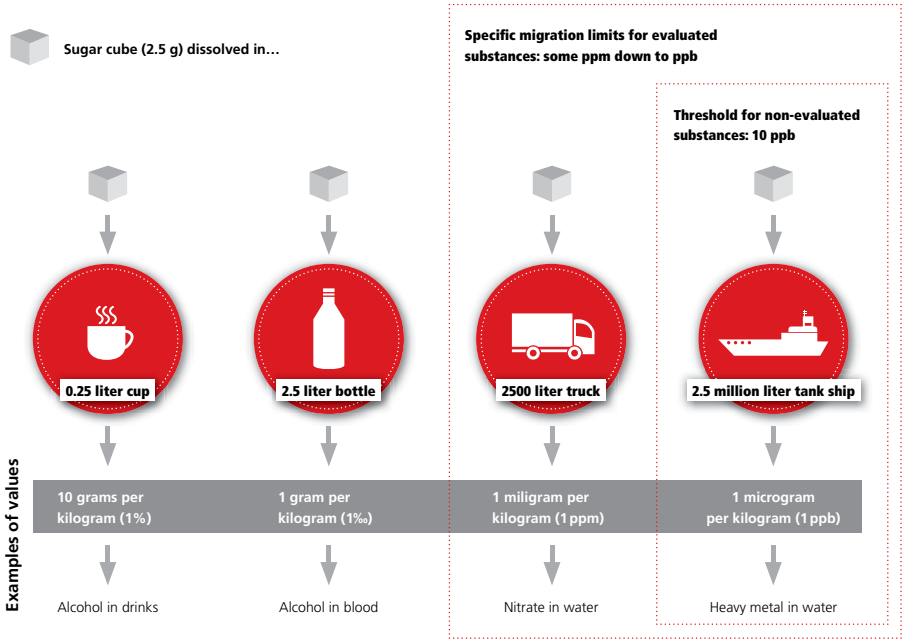
UNDERSTANDING MIGRATION

Siegwerk advises using migration-optimised (MO) printing inks for all print applications related to Nutrition, Pharma or Hygiene packaging ('NPH' applications). However, usage of migration optimised inks requires accurate process control to properly mitigate the migration risk.

There are two types of migration relevant for packaging applications. The imminent migration risk originates from diffusion of small molecules through the substrate material, so-called diffusion migration. The diffusion of small molecular species can be suppressed, or at least slowed down, by applying appropriate substrates, e.g. polymeric films with high barrier properties or absolute barrier materials such as aluminium or glass.

However, when printing roll to roll or stacking printed materials such as cups or trays, set-off migration from the cured ink surface to the unprinted side needs to be considered as well. Therefore, we generally recommend specific migration assessments for each NPH application case.

"UV inkjet has created new possibilities for label-less decoration of consumer goods by direct-to-object printing"



Representation of tolerable migration thresholds for evaluated and non-evaluated substances

FORMULATION CHEMISTRY

From an ink formulator's perspective, the main focus for developing migration-optimised UV inks is on monomer and photo-initiator chemistry. The monomers represent the main part of an UV ink formulation and will mainly determine the properties of the final ink film. Thus, they are critical for achieving proper adhesion, flexibility and resistance of the cured film.

For conventional printing inks, high molecular weight monomers or oligomers are usually the starting point for migration-optimised UV-curable systems. However, the most widely used printhead technologies in single pass UV-inkjet operate in a viscosity range between 5 and 15mPa*s. This low viscosity prevents the usage of high molecular weight monomers or oligomers.

Apart from molecular weight, high reactivity and polyfunctionality can also help to suppress migration. However, as functionality is also connected to size, highly reactive acrylic monomers usually offer the best performance for MO UV inkjet formulations. Fast and complete polymerisation leads to dense polymer networks which can incorporate residual low molecular weight substances, preventing them from migrating.

PHOTO-INITIATORS

Free radical photo-initiators (PIs) are commonly used for printing inks. Radical formation can propagate via two mechanisms, sub-classified into type 1 and type 2 photo-initiators. In type 1, photochemical cleavage of molecular functions, such as aldehydes and ketones, creates two radical moieties which can induce the polymerisation reaction. Widely-used commercial examples are phosphine oxide based compounds such as BAPO or TPO-L. However, as the photochemical cleavage reaction results in formation of small breakdown-products, type 2 PIs are typically more common for MO inks.

"Highly reactive acrylic monomers usually offer the best performance for MO UV inkjet formulations"

Type 2 PIs do not undergo fragmentation, rather hydrogen abstraction from a donor molecule. Such donor molecules are typically tertiary amines, also referred to as amine synergists. Derivates of benzophenones and thioxanthones are common examples of commercial type 2 photo-initiators.

Extensive research has been carried out in the last decades to increase the molecular weight while maintaining high PI reactivity. This has led to the introduction of polymeric photo-initiators, where highly reactive photochemical functions are crafted onto polymeric backbones. Polymeric derivates of benzophenone and thioxanthone are today widely used in MO UV inkjet inks. They have fewer by-products resulting from their photo-chemical reaction and show a higher probability of being incorporated into the cured polymer matrix.

APPLYING HIGH STANDARDS

To enable brand owners, printers and converters worldwide to offer safe solutions to their customers, Siegwerk has established internal formulation guidelines on a global level. Thus ink formulators are given clear guidance on raw material regulations, classifications and purities when formulating inks for NPH applications. As an EuPIA member, Siegwerk is committed to the non-use of raw materials classified as CMR Cat. 1 in any kind of inks and applies the EuPIA Exclusion Policy on a worldwide basis, to not only protect consumers but also production and press operators. ■

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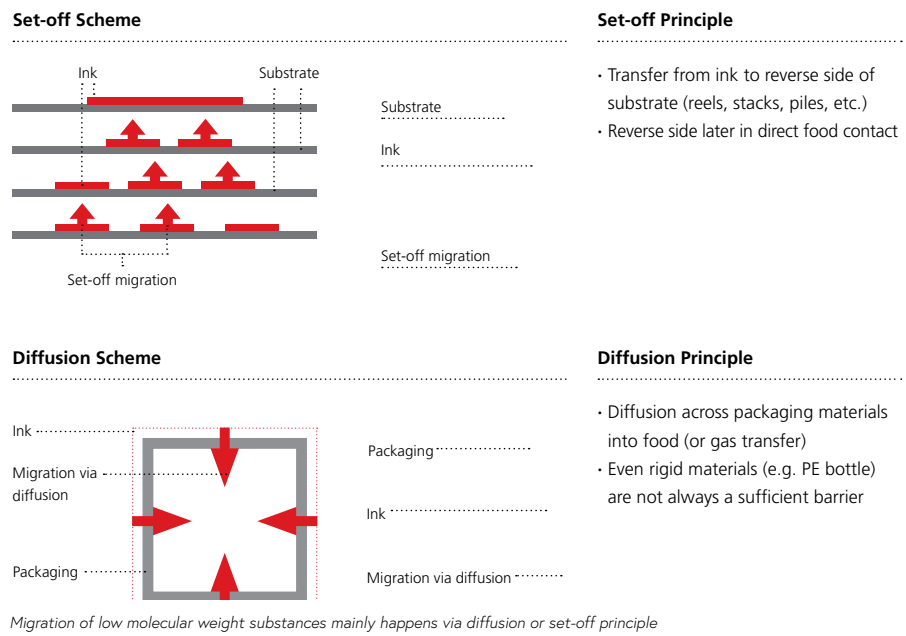


Migration of low molecular weight substances mainly happens via diffusion or set-off principle

PROBLEM SOLVED

Commonly found in coatings and inkjet inks, solvents vary in their ability to dissolve solutes and how safe they are to use. Kouji Nakajima looks at a reduced-toxicity amide-ether option

Having high heat resistance, Polyamide-imides (PAI) and polyimides (PI) are widely used as insulating varnish materials in the application to the coils of electronic devices and high performance coatings – this market is expected to be continuously high growth with the spread of electric vehicles etc. However, PAI and PI are poorly-soluble polymers, making them difficult to dissolve completely using solvents. Typically, non-ionic polar solvents such as N-Methyl pyrrolidone (NMP) and Dimethyl formamide (DMF) have been used to tackle this issue, but due to the safety concerns such as reproductive toxicity, various alternative solvents have been looked into.

Producer of synthetic resins, industrial chemicals and related products, KJ Chemicals Corporation has launched two amide-ether type solvents with high dissolving power that offer an alternative to and can replace N-Methyl pyrrolidone (NMP) and Dimethyl formamide (DMF) on the global solvent market.

Another Japanese company, Idemitsu Kosan Co., Ltd, which handles energy related business, explored using an amide ether solvent (former name: Equamide) candidate for NMP replacement in the past, and started marketing it in recent years.

KJ Chemicals believes it has made technical improvements to this with its own product:

KJCMPA-100 AND KJCBPA-100

KJ Chemicals has produced its own line-up of two highly soluble amide ether solvents: 3-Methoxy-N, N-dimethylpropanamide (KJCMPA-100) and 3-Butoxy-N, N-dimethylpropanamide (KJCBPA-100). The solvents are highly amphipathic [having both hydrophilic (mixes/dissolves with water) and hydrophobic (water-repelling) properties]; in particular, KJCBPA-100 can be mixed completely into water and oils at any ratio.

"KJCBPA-100 can be mixed completely into water and oils at any ratio"

The table below shows Hansen solubility parameters for several non-ionic polar solvents. KJCMPA-100 shows values close to NMP and DMF, while KJCBPA-100 shows the values relatively close to Tetrahydrofuran (THF), which is used as the synthetic solvent for the pharmaceuticals and the agricultural chemicals.

Solvents	δD	δP	δH	δ(J/cm^3)$^{1}/_{2}$
KJCMPA-100	17.2	10.9	9.5	22.5
KJCBPATM-100	16.9	6.4	6.8	19.3
NMP	18.1	10.3	6.6	21.8
DMF	17.0	13.3	10.9	24.2
THF	16.7	4.9	5.5	18.3

(Seiko PMC, 24th National Symposium on Polymer Analysis and Characterisation; 24–25 October 2019, Tsukuba, Japan)

APPLICATIONS

KJCMPA-100 and KJCBPA-100 can be used in the synthesis of [substance] such as PAI, PI, Nylon and Polyurethane resin (PUR); for adjusting the viscosity for the inkjet inks; for improving the dispersion stability of water-based paints; and for manufacturing process applications for pharmaceuticals and agrochemicals.

KJ Chemicals' solvents have a low contact angle and the wettability to the PC substrate is about twice as high as that of NMP (see chart below showing contact angles on different substrates). The solvents enhance the spray stability of printing machineries and can be expected to improve printability on PC and PVC substrates when using the inkjet inks.

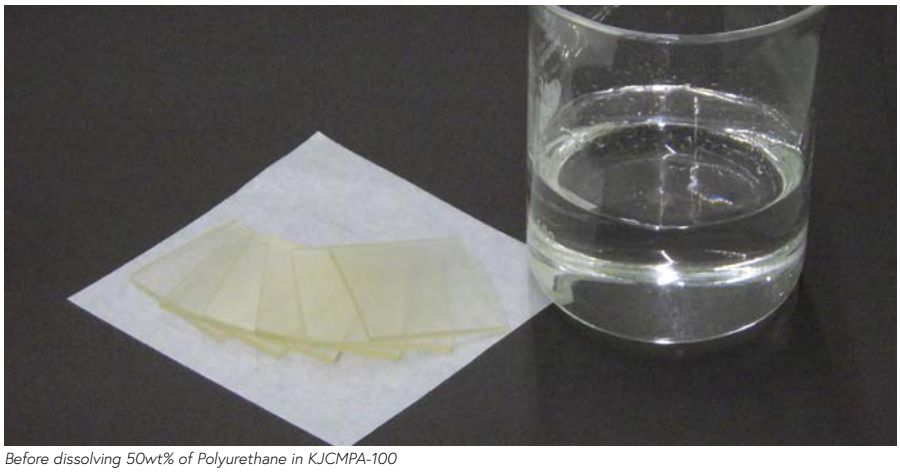
	Substrates		
Solvents	PC	PVC	Glass
KJCMPA®-100	10.8°	14.7°	11.1°
KJCBPATM-100	8.3°	13.2°	17.5°
NMP	20.2°	20.7°	15.2°

MARKETING IN EUROPE

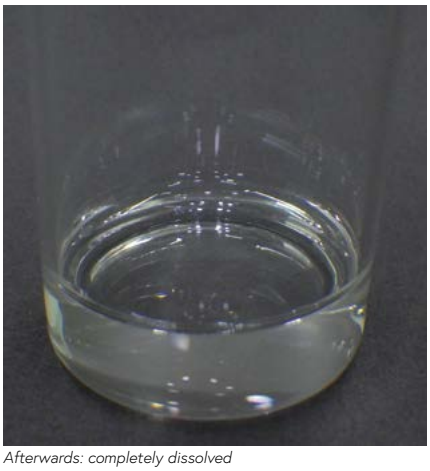
NMP and DMF are listed on the restricted substances list (Entry 71[1], Entry 72[2]) of REACH [Registration, Evaluation, Authorisation and Restriction of Chemicals] Annex XVII due to concern about the reproductive toxicity, and their handlings are currently restricted in Europe. Regarding the reproductive toxicity of KJCMPA-100, several kinds of studies such as the prenatal developmental toxicity study (OECD No.414) were carried out and it was

"The solvents can be expected to improve printability on PC and PVC substrates"

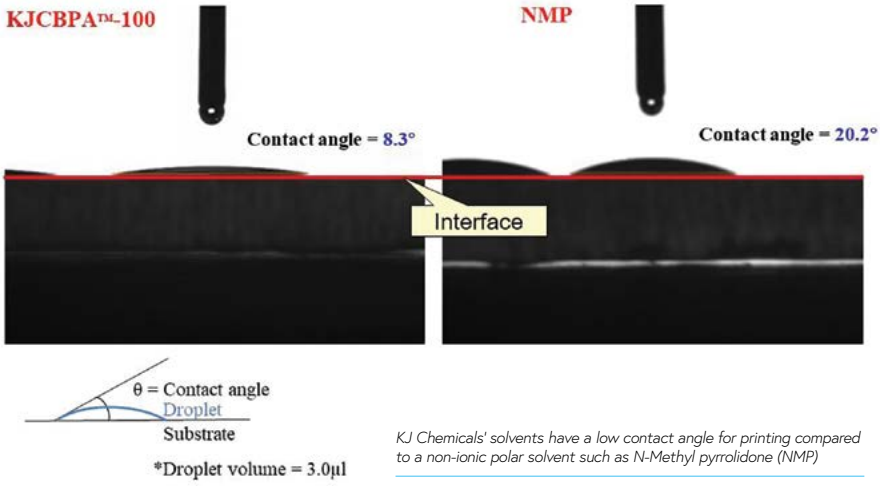
confirmed that this solvent does not show the reproductive toxicity like a teratogenicity [the ability to cause developmental anomalies in a foetus]. Compared to NMP, KJCMPA-100 and KJCBPA-100 are solvents with high safety and low skin irritation, and therefore not subjected to such regulations. KJCMPA-100 is registered



Before dissolving 50wt% of Polyurethane in KJCMPA-100



Afterwards: completely dissolved



KJ Chemicals' solvents have a low contact angle for printing compared to a non-ionic polar solvent such as N-Methyl pyrrolidone (NMP)

in the chemical inventory in major countries; KJCBPA-100 will also meet the regulations of each country depending on the needs of the future market. Alphechem[3], an Italian consulting firm, was appointed to introduce this product to a European chemical maker and is currently engaged in that activity. ■

Footnotes: KJCMPA-100 is a registered trademark of KJ Chemicals Corporation
[1]https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32018R0588
[2]https://eurlex.europa.eu/legalcontent/EN/TXT/?uri=uriserv:OJ.L_.2018.256.01.0001.01.ENG&toc=OJ:L:2018:256:TOC
[3]info@alephchem.com

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FLEXING ITS POWER

Dr Matthew Dyson explains why printed electronics, including wearable technology and smart packaging, is gaining traction across multiple application sectors and could be appearing in many more products and devices over the next few years

Printed electronics is a rapidly emerging approach to manufacturing electronics that is poised to displace conventional electronics in many applications. Rather than etching the circuit onto a laminated sheet of copper on a rigid board, conductive traces are instead printed from conductive ink, often onto flexible substrates. Furthermore, additional functionality such as sensors, photovoltaic cells and even batteries can also be printed.

This alternative manufacturing methodology brings many advantages. Utilising additive rather than subtractive manufacturing means that less material is used, potentially enabling cost savings. Circuits can be lightweight and flexible/conformal, eliminating the form factor constraint of a conventional rigid printed circuit board (PCB). Circuits can be directly printed onto flexible substrates using roll-to-roll (R2R) manufacturing techniques, facilitating both integration into conventional packaging lines and cost-effective manufacturing over large areas. All in all, printed electronics offers many advantages over the incumbent approach, and is being adopted in many applications including flexible displays, packaging, automotive interiors, and wearable healthcare.

"Smart packaging has huge potential to add value to the customer experience and improve supply chain efficiency

FLEXIBLE HYBRID ELECTRONICS

Despite the benefits of printed/flexible electronics outlined here, a key challenge has been the addition of processing/memory. While printed logic is technologically viable, it is essentially impossible to compete with conventional silicon integrated circuits (ICs). As such, most applications are best suited by a hybrid approach that combines printed functionality and placed components. Termed flexible hybrid electronics (FHE), this is perhaps best described as 'print what you can, place what you can't'.

Figure 1 shows a prototypical FHE substrate, comprising a wide range of printed functionality but with logic and memory made separately and mounted (although they can still be flexible). This combination of attributes opens a wide range of application possibilities, across many different industries. Indeed, IDTechEx finds that this could be a $3 billion market by 2030.

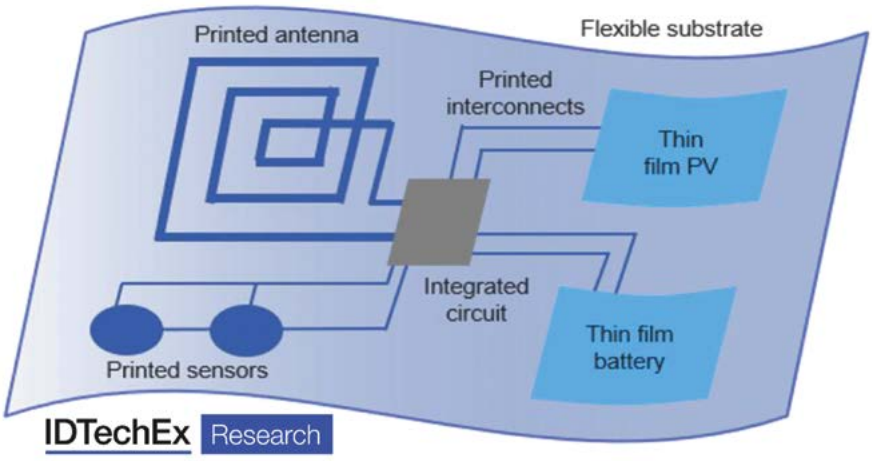
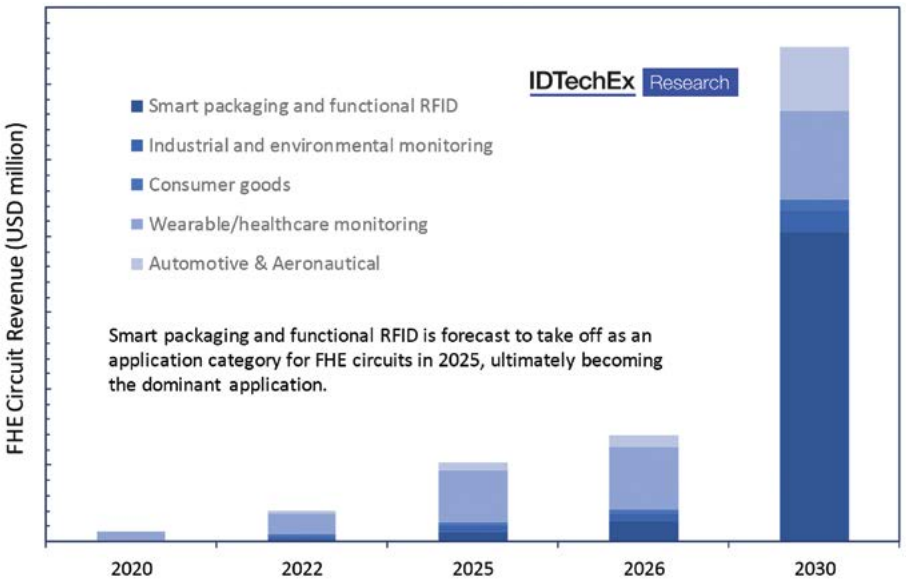


Figure 1: A prototypical flexible hybrid electronics circuit. Source: IDTechEx Research, 'Flexible Hybrid Electronics 2020-2030: Applications, Challenges, Innovations and Forecasts' www.IDTechEx.com/FlexElec

HIGHLY PROMISING APPLICATIONS

Especially promising applications for printed/hybrid electronics are wearable technology and smart packaging, both of which utilise the key benefits of low weight, flexibility/conformality, and potential for high-throughput low-cost manufacturing.

Wearable technology generally involves deploying sensing functionality either as skin patch or within an e-textile, enabling parameters such as heart rate and temperature to be recorded in real time and then transmitted wirelessly. This should enable continuous healthcare monitoring, reducing the need to visit a hospital or doctor's surgery. With such a clear benefit IDTechEx estimates that the wearable skin patch market for healthcare applications



Market forecast (by revenue) for the adoption of FHE for various applications. Source: IDTechEx Research, 'Flexible Hybrid Electronics 2020-2030: Applications, Challenges, Innovations and Forecasts' www.IDTechEx.com/FlexElec

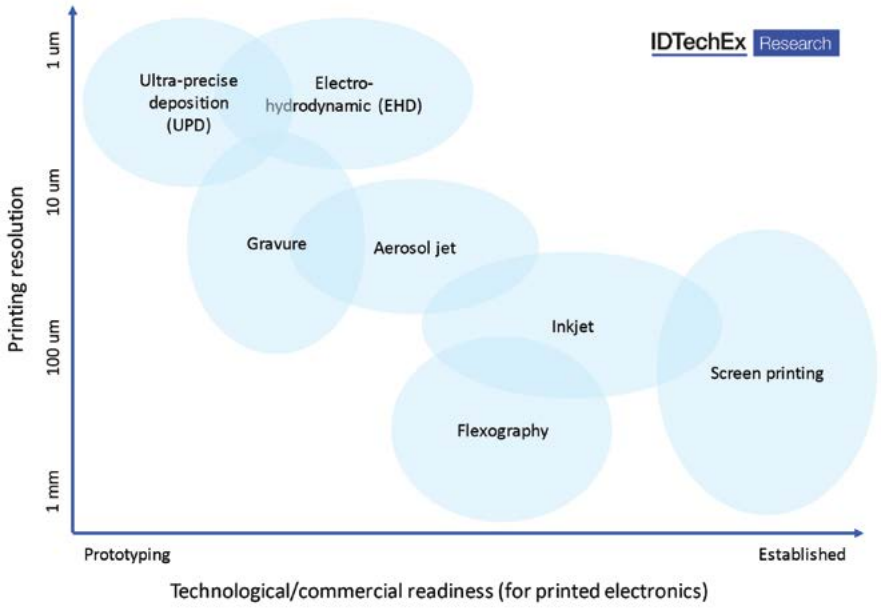


Figure 2: Assessment of various printing technologies used in printed electronics. Source: IDTechEx Research, 'Flexible Hybrid Electronics 2020-2030: Applications, Challenges, Innovations and Forecasts www.IDTechEx.com/FlexElec

will reach around $4 billion by 2030.

Smart/intelligent packaging can be regarded as dramatically extending the capabilities of conventional RFID tags. This can either involve electronic functionality being incorporated during the main packaging process or added afterwards using a functional sticker. It will enable the sensing of gases, temperature, movement, broken security seals, etc. The main challenge in commercialising smart packaging is that many applications, such as monitoring product condition throughout the supply chain, require entering the market at scale to be cost effective. However, smart packaging has huge potential to both add value to the customer experience and improve supply chain efficiency, and thus arguably presents one of the most promising long-term applications of printed electronics.

NEW PRINTING TECHNOLOGIES

In terms of printing technologies, screen printing is still by far the dominant method for conductive inks. This is due to its simplicity and compatibility with viscous flake-based conductive inks (no nozzles to clog) along with multiple substrate

"Electrohydrodynamic printing can produce 1-micron resolution features"

types including textiles. An additional, less commonly cited benefit is scalability, since screen printing can be used for very low-volume prototype printing as well as high volume continuous manufacturing using a rotary screen printer. Although the equipment will obviously need upgrading, the similarity in deposition method reduces the extent of ink reformulation that is required.

However, other printing methods are gradually gaining traction, with wide variation in technologies at different stages of development (see **Figure 2**). Longstanding graphics printing methods such as flexography are best suited to high volume applications such as smart packaging that don't require high resolution. The challenge here is ensuring that the desired properties of the printed conductive/functional materials are fully translated when scaling up from laboratory to prototype to production scale. Indeed, this is one of the central challenges for printed electronics, since attributes such as conductivity and more complex sensing/optoelectronic properties can be strongly influenced by slight changes in processing parameters.

At the other end of the length scale, there is considerable technological innovation in enabling high resolution printing of conductive inks. These include aerosol jet printing, in which a collimated jet of material can be applied to 3D surfaces with a resolution as low as 20 microns. Other emerging techniques are ultra-precise deposition (UPD), in which 1-micron wide lines are produced by forcing a viscous conductive ink though a very fine glass nozzle, and electrohydrodynamic (EHD) printing, which can produce 1-micron resolution features by using an electric field to expel very small droplets.

Despite these impressive capabilities, high resolution printing technologies have arguably yet to find their perfect product market fit. The main challenge is throughput, which is broadly inversely proportional to resolution. As such, with a few exceptions high resolution printing systems have been sold for academic and R&D purposes rather than mass manufacturing. However, throughput can be increased by using multiple nozzles in parallel, with applications such as advanced electronics packaging and repairing TFT backplanes the most promising.

KEY TRENDS IN PRINTED ELECTRONICS

In summary, printed electronics continues to progress, with an increased focus on establishing product market fit. Especially notable is the development of flexible hybrid electronics (FHE), which is becoming established as the dominant approach to incorporate greater functionality in flexible electronic devices. Additionally, Covid-19 has provided substantial impetus for continuous healthcare monitoring, with functional skin patches an ideal application for printed electronics. At IDTechEx we expect printed/flexible/hybrid electronics to be increasingly adopted in commercial applications including smart packaging, wearables, automotive interiors, and consumer goods over the next few years.

"Covid-19 has provided substantial impetus for healthcare monitoring, with functional skin patches an ideal application for printed electronics"

IDTechEx offers a wide range of technical market research reports covering most aspects of printed/flexible electronics, building on the company's long history of analysing these technologies, markets, and applications. Reports especially relevant to this article include *Flexible Hybrid Electronics 2020–2030, Flexible Electronics in Healthcare 2020–2030,* and *Smart and Intelligent Packaging 2020–2030.* All reports include detailed analysis of established and emerging technologies, their potential adoption barriers and suitability for different applications, and an assessment of technological and commercial readiness. These reports also include multiple company profiles based on interviews with early-stage and established companies, along with 10-year market forecasts. A full list of IDTechEx's reports can be found at www.IDTechEx.com. ■

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FRENCH FLAIR MEETS SWISS PRECISION

Rosina Obermayer reports on how an investment in Gallus screen printing equipment helped a prominent French glass manufacturer to improve the efficiency and quality of its tableware production

Rosina Obermayer is the Content Marketing Manager at Gallus Ferd

L–R: David Leblond (R&D Manager), Vincent Delattre (Production Manager) and Jean-François Evrard and Benoit Pouille (Industrial Operators) from Arc in front of the Gallus Screeny Eco400. Picture Source: Arc France

Established in 1825, French glass manufacturer Arc has nearly 200 years of know-how in glassmaking. The company supplies B2B, consumer goods and food service markets with its tableware and kitchen accessories. With several production sites around the world (France, USA, China, UAE, Russia), Arc Group's products are distributed in more than 160 countries.

In spring 2018, Arc used Gallus Screeny equipment on a small scale for the first time in its production, following an extensive test phase. The main application for the Screeny equipment is screen printing on drinkware, e.g. water, wine or beer glasses, as well as decoration printing on the food segment items like honey or mustard jars.

Arc currently uses 64 screen printing stations in its daily production and is impressed by the improved screen life, the reproducibility of high print quality and the very fine details, which they can now produce reliably with Gallus Screeny C-Line precoated mesh.

INITIAL INVESTMENT

"In early 2016 the first request for the Screeny system came from David Leblond, R&D Manager at Arc France who wanted to know what would be needed to implement it and how they could benefit from using the Gallus Screeny equipment," recalls Matthias Rosenfelder from Gallus, Head of New Business Screen Printing. "Then, in spring 2016, they tested the first Screeny C-Line mesh on a printing machine."

Based on these positive experiences, Arc France invested step by step in further Screeny equipment. By summer 2020, Arc was working with a total of 64 printing stations: eight printing machines, each equipped with eight Gallus Screeny C-Line units.

For printing with the product line Gallus Screeny C-Line, the company uses custom-made fast tension frames from Gallus which have increased overall efficiency during the screen printing process. On top of that, in spring 2019 Arc installed the Gallus Screeny

Vincent Lecomte, Arc's Industrial Equipment Operator is impressed by the improved system. Picture Source: Arc France

Compared to conventional screen manufacturing, the Gallus Screeny C-Line offers cost benefits and quality improvements when decorating hollow objects. Picture Source: Gallus Ferd. Rüesch AG

400Eco, a fully automatic developing unit to wash out the screen meshes. For imaging, the meshes the tableware producer uses digital (Computer to Screen) as well as conventional imaging processes.

INCREASED PRODUCTIVITY

Arc reports a longer screen lifetime, reliable reproducibility in print and perfect quality. In combination with the fast tension frames and the 400Eco developing unit, the company noted significant improvements in productivity as well as efficiency. The Gallus Screeny C-Line, including the frame system, is suitable for thermoplastic, UV, solvent and one and two-component ink systems. The ideal application is direct printing onto hollow objects.

To achieve fine definition of details and reliable/reproducible print quality, Arc France employs eight Gallus machine systems, each equipped with eight screen printing units. Picture Source: Gallus Ferd. Rüesch AG

PRINTING FINE DETAILS

Printing reproducible applications with very fine definition of details was and is still Arc's primary reason for investing in the Gallus Screeny C-Line. Using its stencils, very fine details can be printed and high reproducibility achieved. Fine fonts or lines can be printed easily, reliably and efficiently in addition to the positive productivity impact. In addition, the precoated C-Line screen printing plates enable a fast production time of just ten minutes for a ready-to-print stencil, compared to a lengthier (60-minute) conventional screen manufacturing process.

"Gallus technology improves the definition of details, especially in food packing business and offers perfect reproducibility in print quality," attests Nicolas Heunet, Plant Manager at Arc France.

"With Arc, we prove that Screeny C-Line is perfectly suited for the segment drinkware – more precisely, for drinking glasses," states Matthias Rosenfelder, Head of New Business Screen Printing at Gallus. "With our products we are meeting all market requirements including all ink systems available on the market. Experiencing such a great improvement regarding productivity, reproducible print quality as well as fine details makes me proud each time we implement our Screeny equipment," he concludes. ■

Jean-François, Industrial Operator at Arc, during preparation of Gallus Screeny C-Line meshes. Picture Source: Arc France

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TESTING TIMES

Succeeding in remaining open throughout 2020, Natgraph not only faced off Covid but also put its industrial print drying and curing machinery to the ultimate test: by sharing live videos of its product range in action

For the past forty years drying technology specialist Natgraph has welcomed customers from a wide range of industries, from automotive to medical to renewable energy, to collaboratively innovate on industry-leading drying and curing solutions.

The testing facility that Natgraph developed at its Nottingham headquarters is a cutting-edge technical workshop and showroom. When the world locked down in early 2020, this vital resource needed to be adapted to meet the challenges that the strange situation had brought.

CONQUERING COVID

As a vertically integrated manufacturing business, Natgraph remained open and busy throughout 2020. With both technical and manufacturing teams remaining on site, the only barrier to continuing with testing was physically bringing customers to site. This could have proved a huge issue for a business which predominantly operates in export markets including Asia, North America and Europe.

Natgraph did everything possible to remain ahead of the issues and quickly upgraded its showroom with full videoconferencing and live streaming facilities, allowing customers to participate in testing safely from the comfort of their offices or homes. Customers can dial into the showroom on Teams or Zoom to experience 4K quality video of testing as it happens. Once Natgraph is happy with the finished product, all of the fully annotated testing materials are couriered back to the customer so that results can be confirmed at their own base.

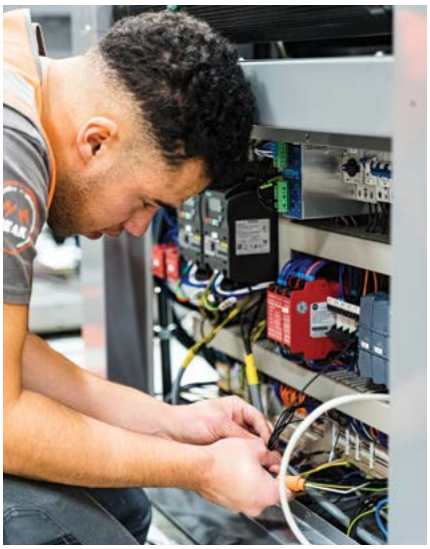
Natgraph dryers are designed and built in the manufacturer's Nottingham factory

"There have been breakthroughs which will continue delivering benefits to our customers long after the pandemic is over"

"We have been surprised by how effectively this process has evolved and there have been some real breakthroughs which will continue delivering benefits to our customers long after the pandemic is over," said George Atkinson, Natgraph's EMEA Sales Manager. "The initial stages of any new product or process development can be done remotely in future, reducing both the time and the investment that customers have to commit to the process.

"Covid has pushed our partners in differing directions," he continued. "Some have seen demand increase exponentially which has meant they do not have a huge amount of time to participate in product development. This has been ideal for them as we can function as an outsourced R&D department. Others have seen sales slow, allowing them to look at making big picture

A Natgraph hot air/infra red dryer. Prospective customers can now dial into the company's showroom on Teams or Zoom to experience live product testing as it happens



The highly trained and experienced workforce at Natgraph has been built over more than 40 years

changes and begin significant production reorganisations. For these customers we have been able to provide the same level of service but with a particular focus on adaptability, forward compatibility and pre-engineer functionality to easily install future upgrades."

TEST CENTRE UPDATES

Strong demand for the Natgraph Test Centre has prompted an update to the main dryer to bring it in line with the standard Siemens control system that is fitted to all Natgraph dryers. Additionally, the system has been fitted with the latest remote access modules and energy monitoring.

The new system includes:

- Siemens S7 PLC and KTP touch panel.
- Additional alarms and intuitive fault finding.
- Wide range of speeds, air velocities, temperatures available, most common dryer formats can be simulated.
- Infra-red options are split within drying modules for maximum flexibility and ideal location confirmation.
- Real time energy consumption and production data monitoring can be demonstrated with external accessibility and connection to local ethernet networks.
- Industry 4.0 standard allows external accessibility and connection to the wider world to record all data captured at the machine.
- Remote control / monitoring of the drying and stacking equipment from any networked device.
- Dial-in capability using GSM mobile data with remote access for diagnostics and servicing.
- 'Intelligent Energy Control System' is fitted as standard for demonstrating the energy saving potential of this system.
- Various dryer configurations can be simulated for customer testing and energy consumption information.
- Full line integration of the print and stacking equipment.

The standard operating system has the added benefit of making the machinery accessible for engineer training and hands-on experience with the dryer.

In summary, Natgraph actually strengthened its testing capability for its customers and potential future users. This was achieved during a challenging Covid-driven market, with reduced travel options and tightening costs being key business considerations for all involved. ■

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LIGHTING THE WAY

A specialist in UV technology, Technigraf has manufactured exposure units, dryers and measuring instruments in Germany for over 50 years. Karlheinz Mohn explains how the company grew and why it decided to introduce custom equipment to its product portfolio

It was probably a very cold day on 15 December 1965, the considered birthday of Technigraf GmbH. Fifty-six years ago Walter Stumpe and his wife Ruth founded their company in the Hessian town Grävenwiesbach outside of Frankfurt.

For more than 45 years Technigraf was a pure family business. In 2012 several private investors took over the company and today it is a subsidiary of the Dr. Hönle AG.

Now with 4500m² of production facilities and 17 employees the mid-sized company develops and manufactures UV belt dryers and exposure units for customers across the world.

POPULAR PRODUCTS

Mainstream is for competitors, believes Technigraf. The company offers both standard and customer-based machinery. Three main categories characterise the standard product portfolio: UV dryers, UV exposure units and UV measurement technology.

The popular UV belt dryers are used by many companies that develop and synthesise paint, lacquers, adhesives and coatings for curing with UV light. Technigraf's UV modules are also widely used in various screen printing and digital printing operations and with other general production machinery.

In the screen printing industry Technigraf is a well-known name and its associated products (Akticop, Variocop, etc.) are appreciated for their stability, longevity and ease of use.

Rotative curing with Technigraf's Aktiprint B compact LED UV dryer. Single-side material feeding and output enables fast curing of UV inks or coatings on containers or moulded parts made of plastic, metal or glass

Another smaller product area of Technigraf is its UV measurement technology; for example its flat pass-through devices and cylindrical devices for rotational appliances to measure UV dosage and intensity.

BESPOKE SOLUTIONS

For the past five years the company has focused on highly customised and custom-tailored solutions developed and manufactured especially for customer needs. Although some of these machines do not carry the Technigraf label, they still represent the character of the company in different ways and markets.

One example is a UV drying system which was developed and designed by the internal design department and produced in the shortest time possible. This UV drying system is an all-rounder which works for a lot of different requirements with uncommon products in various branches.

To meet such requests requires cooperative partnerships, highly motivated staff and flexible production lines, and the manufacturing processes of the customers need to be understood. One of the most essential steps is the selection of an appropriate light source with a matching power level and configuration. Depending on the requirement of the application, conventional UV light sources, UV LED systems or special spectral ranges (like UV-C) are used.

"Technigraf's UV modules are widely used in screen printing and digital printing operations"

Often the curing of the workpiece or product must be combined with a transport system. That can be either linear, rotational or combined movements or procedures.

The company prides itself on its high manufacturing quality and level of flexibility

MOVING WITH THE TIMES

Exceptionally slow or very fast speeds can be achieved with the system to adjust the curing time to fit specific cycle times of the production machinery. The interface of the UV system to adjacent or superordinate machinery must be defined precisely for the correct communication between the systems. With this target in mind the company was gradually modernised. The introduction of a new 3D-CAD system (Computer Aided Design) with the ability to involve production machinery by CAM (Computer Aided Manufacturing) was the basis for successful customised products in different markets. The deployment of modern electronics and the transition to flexible control technologies with customised programming was achieved.

Technigraf's headquarters in central Germany feature a 4500m² production area

Another essential step was the purchase and set up of new manufacturing equipment in order to make the current production faster, more efficient and especially much more flexible. While this process is not yet fully complete, Technigraf already offers many different manufacturing technologies for sheet metal forming, metal machining and polymer processing.

"The ability to involve production machinery by CAM was the basis for successful customised products"

Working with the automotive industry, glass industry, wood industry, electronic manufacturing, adhesives or printing industry, Technigraf has accrued a wealth of experience and provided numerous solutions. It plans to continue this progress and mark off many more anniversaries… ■

Karlheinz Mohn is Managing Director of Technigraf

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VIRTUAL.DRUPA

A four-day 'virtual. drupa' will run from 20–23 April 2021

A digital version of drupa will take place online this April, to coincide with the 2021 trade fair's rescheduled time frame and act as an interim solution until 2024

Following close consultation with exhibitors and partners, the 2021 edition of the drupa trade fair for Printing Technologies has been cancelled due to the impact of the coronavirus pandemic. To maintain momentum until the next scheduled event in summer 2024, the organisers are holding a four-day digital 'virtual.drupa' which will run from 20–23 April 2021 – the trade fair's optimistically rescheduled time frame after a decision was made to postpone drupa 2020.

Launched in October 2020, the digital drupa preview platform offers an impression of what virtual.drupa will look like. The online event is intended to give companies the opportunity to showcase themselves and their innovations virtually, as well as maintain existing contacts and establish new ones via a 'matchmaking' feature. In addition, the conference schedule of the five drupa hotspots aims to set the agenda for an online transfer of knowledge, while international speakers from vertical markets have been lined up to present success stories of Future Technologies in the Cube.

200 YEARS OF EXPERTISE

"Our members are telling us that trade fairs to drive their business forward are still in great demand. The value and appeal of drupa remain intact. The decision to suspend it in 2021 is entirely down to the pandemic," stressed Dr Markus Heering, Managing Director of the VDMA Printing and Paper Technology Association. "In the long run, it is important for all of us to maintain drupa as an international platform in Europe, as it displays the diversity of our industry. Two hundred years of expertise are rooted in Europe and must continue. However, we welcome the introduction of the new digital platform as an interim solution until 2024."

The next physical drupa will take place from 28 May to 7 June 2024. ■

Further information:
web: www.drupa.com

NEW DATES FOR FESPA 2021

Following a change in location from its original venue in Madrid, FESPA 2021 has been delayed and will now take place from 12–15 October in Amsterdam

In challenging times there is strength in community, believes FESPA CEO Neil Felton

At the beginning of December 2020 FESPA was on course to deliver its live Global Print Expo and European Sign Expo events in Amsterdam in Spring 2021 but the "constantly changing conditions created by Covid-19" posed too great a challenge: "I never imagined that we would have to postpone this event again" said FESPA CEO Neil Felton, "but in the face of continued uncertainty around travel restrictions in Europe, we have taken the only reasonable decision in the interests of our exhibitors and visitors. The delayed event will now take place from 12–15 October 2021 in Amsterdam."

By postponing the event FESPA hopes to still be able to bring together a comprehensive line-up of suppliers with innovations to share. "By Autumn 2021, I believe we'll all be readier than ever to step out of our routines and re-connect with one another in the real world" maintains Felton. "From our exhibitors to our members, everyone we speak to tells us that we need live events. That they are fundamental to the recovery of our sector from the obstacles thrown at us by the pandemic. We need clear business strategies, and we need to invest if we are to move forward and meet the changing needs of our customers. To do that, we must see products close-up, compare solutions from different suppliers, speak with experts. But above all, to recover and make progress, we need to come together as a speciality print community. Together, we can assess our opportunities, share ideas, and be inspired and energised by one other," he concluded.

COMMUNITY SPIRIT

As an international business support organisation, FESPA has been helping speciality printers to succeed for over 50 years. Without live events, conferences or seminars during the pandemic, the organisation has focused on supporting its national Associations to help members locally. It has also expanded the advice and educational content available via its online platforms, and a new online showroom brings together news and technical information from exhibitors at www.fespaglobalprintexpo.com.

FESPA's new Coffee Break webinars are available online offering advice on automation, process control and sustainability as well as recovery strategies, and will continue to be developed in the coming months.

In addition, the most recent material on www.fespa.com has now been translated into 36 languages, enabling access to information in other languages for the first time.

"FESPA is here to support you with knowledge, education, and best practice advice, and to help you make meaningful connections that help you thrive, whatever the backdrop" stated Mr Felton. ■

Further information:
web: www.fespa.com

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LOPEC 2021

The central platform for the printed electronics industry maintains its global reach with an online event and conference this spring

LOPEC, the international exhibition and conference for the printed electronics industry, takes place online from 23–25 March. With the online format, Messe München and its partner OE-A (Organic and Printed Electronics Association), aim to facilitate an international industry meeting despite the continuing travel restrictions worldwide.

With its online format, LOPEC offers a concept that enables the entire industry to obtain information, to exchange views and to network in one single place, even under the current conditions. "In this year's virtual format, LOPEC will be the central platform with a global reach for the entire industry" predicted Falk Senger, Managing Director of Messe München.

LOPEC 2021 and the LOPEC Conference will take place online from 23–25 March

"Despite all the challenges, we clearly see that the printed electronics industry is resilient and creative" added Klaus Hecker, Managing Director of OE-A. "In the medical and healthcare industry, in particular, we see numerous Corona-related new applications made possible by this innovative technology."

LOPEC CONFERENCE

The central element of the online version of LOPEC is the LOPEC Conference. Wolfgang Mildner, General Chair of LOPEC, has provided first insights into the virtual Conference programme: "We have already received commitments from Dr. Kiarash Vakhshouri from Google Inc. (USA)" he reported, "as well as from Dr. Xiaolin Yan from TCL Corporation (China), and John A. Rogers, professor at Northwestern University in the US state of Illinois, who will talk about their experiences and applications with printed flexible electronics."

Presentations from the LOPEC Conference will be made available to all participants via live streaming service and on demand. ■

Further information:
web: www.lopec.com

UNIFORM & SPORTSWEAR VIRTUAL EXPO

A virtual exhibition form of Uniform & Sportswear Expo 2021 will take place from 8–11 April

Exhibition organisers Aditya Exposition are in the midst of a giant social media campaign for their first 'Sportswear and Uniform' Expo in virtual format, to be held from 8–11 April 2021.

Exhibition organisers Aditya Exposition are busy promoting the virtual Sportswear and Uniform Expo across social media

To draw maximum attendees the organisers are reaching out to their targeted audience on all available popular platforms. These include sportswear manufacturers, buyers, exporters, wholesalers, and dealers in the sector, corporate, sports organisations, clubs, yoga and gym clubs, sportspersons, coaches and sports therapists.

"Virtual trade shows are relatively low-cost and substantial ROI" said Devang Sheth, Director of Aditya Exposition. "The ability to generate qualified leads directly from one's office without having to run up expensive travel bills makes virtual trade shows extremely attractive. Lower barriers to entry also mean that virtual trade shows attract more diverse exhibitors and attendees, creating massive online audiences and leads."

According to an online report the activewear market in India has witnessed a steady growth in terms of market revenue over the last five years. Another online source predicts that the school uniform market is expected to register a 7.6% compound annual growth rate in terms of revenue and that the global market size will reach $25,710 million by 2025, up from $19,200 million in 2019. ■

Further information:
web: www.uniformandsportswearexpo.com

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THE BREXIT EFFECT

Elaine Campling looks at how the UK's departure from the European Union will affect the chemical products trade and highlights key registration deadlines for importers

Elaine Campling is a member and former Chair of ESMA's Health, Safety & Environmental Protection Committee

Following the departure of the United Kingdom from the European Union, the transition period came to an end at 2400 hours CET on 31 December 2020. The United Kingdom (UK) is no longer a Member State of European Union (EU). However, after many months of wrangling, the European Union Trade and Cooperation Agreement was finally agreed on 24 December 2020.

During the transition period, the chemical industry was proactive in arguing for regulatory alignment on chemicals. It is worth noting that EU legislation that applied directly or indirectly to the UK before the end of the transition period has been retained in UK law, including the REACH [Registration, Evaluation, Authorisation and Restriction of Chemicals] Regulation.

REACH REGULATIONS

The EU REACH Regulation has been replicated in the UK, as Statutory Instrument No. 758 'The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019', otherwise known as UK-REACH. However, UK-REACH is only applicable in England Scotland and Wales, as Northern Ireland continues to follow EU legislation, under the Northern Ireland Protocol.

One of the most demanding aspects of the REACH Regulation is the requirement to register substances introduced to market in quantities of 1 tonne or more per annum. REACH also applies to substances in mixtures (and certain articles), making it necessary to calculate volumes of substances imported from third countries to understand whether registration of constituent substances is required. Import is considered 'placing on the market', defined as:

"Supplying or making available, whether in return for payment or free of charge, to a third party. Import shall be deemed to be placing on the market." – Article 3 (12) REACH Regulation

Non-EU/EEA companies are not permitted to undertake REACH registration but can use the services of an 'agent' in the EU/EEA to undertake registration on their behalf, termed an Only Representative (OR). If there is no OR in place, it is the importer's responsibility to conduct registration.

UK/GB-BASED COMPANIES

This also applied to UK importers of chemicals from outside of the EU/EEA when the UK was a Member State of the European Union, and now to GB importers when there is no GB-based OR in place under the independent UK-REACH Regulation. This is further complicated by GB and the EU becoming third countries to one another, meaning that importers on either side will gain REACH registration duties unless an OR can be put in place.

However, UK-REACH has been introduced with transitional arrangements. Historic EU REACH registrations legally held by UK-based companies will be 'grandfathered' directly into the GB REACH system, though 'basic' information on the substance must be submitted to the UK Competent Authority, the Health & Safety Executive (HSE) within 120 days of the end of the transition period. The process of full registration must be completed within phased time periods (2, 4 or 6 years) from 28 October 2021, depending on tonnage/hazard.

"GB-based companies must ensure that a valid GB REACH registration is in place, due to their new importer status"

GB-based companies that were previously considered downstream users or distributors under EU REACH that import substances from the EU above threshold, or qualifying substances in mixtures (and certain articles) must ensure that a valid GB REACH registration is in place, due to their new importer status.

However, if a Downstream User Import Notification (DUIN) is submitted to HSE within the first 300 days of the end of the transition period, full registration may also be completed within the phased time periods, set out in the table below.

The deadlines are set to ensure that high tonnage, high hazard chemicals are registered first.

It is important to note that a non-GB based manufacturer, importer or article producer can appoint a GB-based OR to submit a DUIN on behalf of their GB importer. Furthermore:

"GB-based importers that were regarded as downstream users due to the appointment of an EU-based OR (under EU

Deadline post 28 October 2021	Tonnage	Hazardous property
2 years from 28 October 2021	1000 tonnes or more per year	• Carcinogenic, mutagenic or toxic for reproduction (CMRs) – 1 tonne or more per year • Very toxic to aquatic organisms (acute or chronic) – 100 tonnes or more per year • Candidate list substances (as at 31 December 2020)
4 years from 28 October 2021	100 tonnes or more per year	• Candidate list substances (as at 27 October 2023)
6 years from 28 October 2021	1 tonne or more/year	

The process of full REACH registration must be completed within phased time periods from 28 October 2021, depending on tonnage/hazard

REACH) are also able to notify under Article 127E. A newly appointed GB-based OR can also make this notification on their behalf."

There is no obligation to conduct a full GB-REACH registration after the transition periods specified unless import is continued.

EU/EEA IMPORTERS

From the EU side, no such transitional arrangements have been put in place for imports of chemicals from GB. EU/EEA importers will now be responsible for immediate EU-REACH registration of qualifying substances, including substances in mixtures, unless an OR is in place, or the substances are re-imports. Re-imported substances including those in product compositions may be exempt from registration, providing supply chain requirements are met for REACH registered substances.

CLP REGULATION (EC) NO.1272/2008

The CLP Regulation (EC) No.1272/2008 pertains to the classification, labelling and packaging of substances and mixtures.

GB importers will also be impacted by other duties in relation to the CLP Regulation, which has been introduced into GB as the GB CLP Regulation:

- Notification of the classification and labelling of substances to the GB classification and labelling notification database
- Ensure that substances and mixtures are classified, labelled and packaged in accordance with GB CLP before placing them on the GB market
- Comply with GB mandatory classification and labelling, equivalent to 'harmonised' classification and labelling under EU CLP

The EU/EEA importer will also be responsible for compliance on classification, labelling and packaging of chemicals imported from GB, according to EU-CLP.

"EU/EEA importers will now be responsible for immediate EU-REACH registration of qualifying substances unless an OR is in place, or the substances are re-imports"

The GB CLP Regulation will be updated in accordance with the United Nations Globally Harmonised System of classification and labelling of chemicals (UN GHS) in a similar way to the EU CLP Regulation.

However, regulatory divergence between EU and GB regulation is possible going forward. The UK HSE has indicated the possibility by reference to classification and labelling:

"… GB will be able to make its own decisions on mandatory hazard classification and labelling, including whether or not to align with decisions made in the EU or other countries."

FURTHER READING:

- REACH: (Amendment etc.) (EU Exit) Regulations 2019 (www.legislation.gov.uk)
- The Northern Ireland Protocol (www.gov.uk)
- UK REACH: Notification of status as a GB-based downstream user or distributor under EU REACH (www.hse.gov.uk)
- The EU-UK Trade and Cooperation Agreement | European Commission (https://ec.europa.eu) ■

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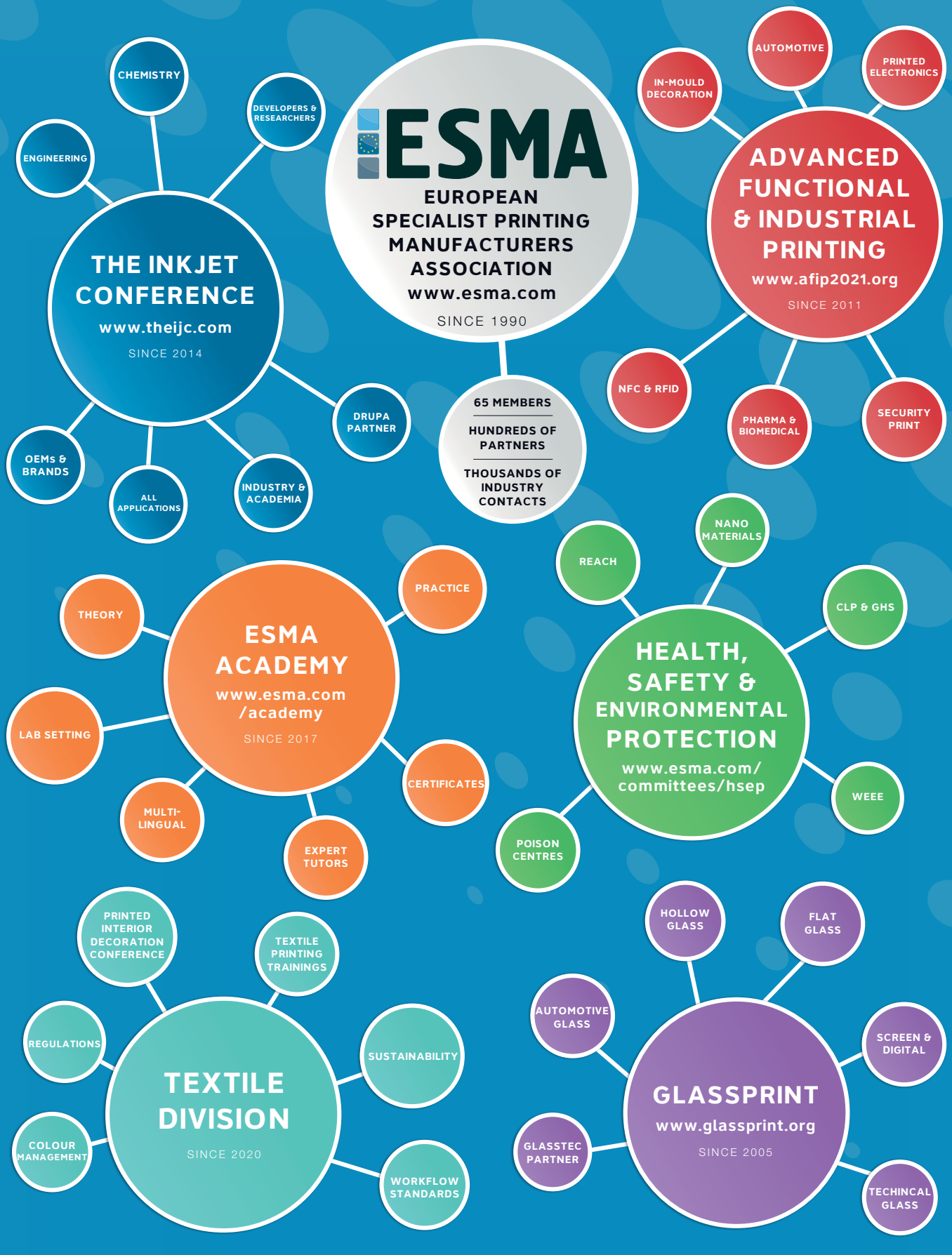

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IIJ celebrates 15-year anniversary

December 2020 was the 15-year anniversary of inkjet system supplier Industrial Inkjet Ltd. (IIJ).

The company was formed by current Managing Director John Corrall at the suggestion of Konica Minolta in Japan who were looking for someone to support their printhead customers in Europe and USA.

Director and General Manager Lesley has been with IIJ from the beginning, 15 years ago

Starting in a small converted farm building, the first employee hired was Lesley Scanlon, who is still with the company as a Director and General Manager. Around 2008 the company started to branch out into manufacturing inkjet 'Print Engines'. "At that time we were dedicated to helping machine builders integrate Konica Minolta inkjet printheads successfully" recalled Corrall. "But we found ourselves solving the same technical issues over and over. It made sense to take that knowledge and create inkjet modules that our customers could then easily integrate."

The company now has over 50 staff and 17000ft^2 premises near Cambridge, along with satellite offices in USA and South Africa. Since 2005 over 500 inkjet print engines have been installed worldwide; key business areas are security printing, packaging and décor. Despite the Covid-19 coronavirus and the threat of Brexit, IIJ had a record year in 2020 and has new products coming online in 2021. ■

View of current IIJ premises in 2020

FuturePrint shares key themes for 2021's virtual events

If 2020 was the year for crisis management, so 2021 must be the year for leadership and adaptability, according to FuturePrint's virtual events programme.

Focusing on new technology that enables production to adapt to fast changing demand, The FuturePrint Virtual Conference takes place from 25–26 February.

The FuturePrint vCEO Summit which addresses vision, strategy and leadership with delegates hearing from the leaders in print technology will be held on 23–24 March.

According to Co-Founder of FuturePrint, Marcus Timson, "The FuturePrint Virtual Event community grew from 400 people in February 2020 to well over 8,000 now, underlining the demand to connect and stay in touch with developments via quality virtual events. We will continue to run our events with some of the world's leading innovators delivering content designed to help the print sector from industrial through to commercial print" he confirmed.

For more information contact Marcus.timson@fmfuturenow.com

www.futureprint.tech ■

EFI Reggiani completes triple textiles sale in Russia

Together with its partner in Russia, Nissa Distribution, EFI Reggiani has completed three new sales contracts for the supply and installation of industrial solutions for direct-to-fabric and sublimation industrial textile printing.

Russia's first EFI Reggiani Power 180 and Power 240 were sold to D-Tex Digital Textile Printing, located in Stupino, in the Moscow Oblast, and to Mirtex, in Furnmanov, Russia. The companies are installing the industrial machines to print and manufacture products using natural fibres and knitwear.

The EFI Reggiani Next 340 printer is being installed by the largest wholesale textile company in Russia: Sima-Land. The Yekaterinburg-based company's 3.4-metre-wide machine for direct and sublimation printing is equipped with four Kyocera industrial printheads for decorating a range of products including décor textiles for the home and office and men's, women's and children's clothing.

"We are very excited about the success working with Nissa Distribution and Nissa Stensart to grow EFI Reggiani's presence in the important Russian market," said EFI Reggiani Senior Vice President and General Manager Adele Genoni. "The installation of high-performance EFI Reggiani industrial digital textile printers at three of the largest textile companies in Russia, and the ability to help these customers grow in the midst of a pandemic, reflect the serious commitment EFI Reggiani and our partners have in helping customers thrive and grow with efficient, productive and green digital printing solutions."

www.efi.com/reggiani ■

EFI Reggiani is enjoying great textile success in Russia

Gerber's PPE task force donates 5,000 gowns to organisations in need

Through its gown donation efforts Gerber is helping to ensure health organisations across the USA have access to high-quality, industry-standard PPE

Responding to the significant rise of Covid-19 cases in America, software and automation specialist Gerber Technology has partnered with its network of manufacturers and charitable associations RetailersUnited and Fashion For the Frontlines to donate 5,000 protective gowns to organisations in need.

The Level 1 gowns are made of DuPont Tyvek material that is specifically assigned to Gerber Technology for use in PPE (personal protective equipment) production. All of the gowns are being produced in US factories.

Recipients of the donated gowns include: NYC Mayor's Office for People with Disabilities for local distribution, Eger Healthcare and Rehabilitation Center, Housing Works, Inc. and the Great Plains Tribal Chairmen's Health Board.

Gerber has been committed to making PPE more widely available with the creation of its PPE Task Force in March 2020. Since then, the technology partner has helped over 1,700 companies pivot their supply chain for PPE production.

"We continue to see unmet needs of PPE across the US in hospitals, healthcare systems, retailers, communities and more, but by simplifying the supply chain and producing more PPE domestically, these shortages will be mitigated," said Deborah Weinswig, a Board Member of RetailersUnited, which is focused on helping America reopen for business. "We value our continued collaboration with Gerber Technology and thank them for this contribution."

"We are proud to be doing our part to help frontline workers be safer as they perform critical services for their communities" responded Karsten Newbury, Chief Strategy and Digital Officer at Gerber Technology. "We are grateful for the partnerships with the manufacturers who have done their part to produce personal protective equipment during this very difficult time."

www.gerbertechnology.com ■

Guido Van der Schueren, Chairman of Global Graphics

Global Graphics completes acquisition of Hybrid Software

Following the passing of a shareholder resolution at a General Meeting held on 8 January 2021, Global Graphics PLC completed its acquisition of the Hybrid Software Group from Congra Software.

Hybrid Software – a group of software development and marketing companies focused on enterprise software for the graphic arts industry – becomes the fourth subsidiary company in the Global Graphics group and sits alongside Global Graphics Software, Meteor Inkjet and Xitron.

The €80 million acquisition roughly doubles the size of the Global Graphics group of companies, expanding the global workforce to around 250 people. It also adds operating locations to the group through Hybrid Software's offices in Luxembourg, Belgium, Germany, Italy, France and the USA.

"As the packaging industry continues its migration to digital printing, there are tremendous opportunities for Global Graphics' hardware and software solutions, so bringing Hybrid Software into the group will help us grow our share in labels and packaging," said Guido Van der Schueren, Chairman of Global Graphics. "Exciting times lie ahead as we launch new initiatives in response to customer demands, ranging from innovative new products to subscription-based licensing models."

"This acquisition makes Global Graphics stronger than the sum of its parts," stated Global Graphics' CEO Mike Rottenborn. "We'll be able to take Hybrid Software's expertise in file preparation and enterprise production workflow gained in the labels and packaging segments and expand this out across all the industry segments we serve," he added.

www.globalgraphics.com ■

American print company helps renovate museum using Roland technology

Asheville Color and Imaging of Asheville, North Carolina, USA used a Roland DG TrueVIS VG2-540 digital printer/cutter to produce three vibrant wraps to decorate lifts at Asheville Art Museum.

Part of the museum's renovation, the project consisted of two full walls on two separate elevators and the installation was completed just before the Covid-19 pandemic shutdown began (the museum had reopened to visitors at time of writing).

"With the word 'colour' in the name of your company, you have to make sure you do it very well," said Jeffrey Jones, Owner of Asheville Color and Imaging. "The TR2 inks with the Orange option have been a great addition for us – they've really expanded the colour gamut, opening up new creative opportunities."

www.rolanddg.com ■

Elevator wrap produced by Asheville Color and Imaging using a Roland DG TrueVIS VG2-540 digital printer/cutter

I4F partners with Hymmen for exclusive licensing rights

Hymmen GmbH Maschinen- und Anlagenbau, the digital printing systems provider specialising in flooring, has entered into a patent partnership with I4F, an innovations group focused on the development of patents and technologies for the flooring industry. The strategic partnership gives I4F exclusive licensing rights for all of Hymmen's digital printing patents and technologies for flooring production. The agreement augments I4F's digital printing portfolio, which already includes technologies from Classen, Kronospan and Benchwick.

I4F plans to work in close collaboration with Hymmen to promote digital printing opportunities in the flooring industry and will represent Hymmen on future patent protection-related issues. Historically, Hymmen has maintained a strong intellectual property (IP) position including, for example, its recent filing of a patent infringement lawsuit against Barberán S.A. at the District Court in Düsseldorf (see *Specialist Printing Worldwide* issue 3 2020, p44).

"The ability to produce high quality digitally printed flooring has become strategically important for the future of our industry" stated John Rietveldt, I4F's CEO. "I4F believes that Hymmen not only has the most innovative and highest quality technologies, it also maintains a fiercely strong IP position. This latest addition to our patent cluster concept reinforces our promise to licensees to receive the world's best, most cutting-edge technologies in the industry backed up by a robust patent protection infrastructure."

"I4F is the perfect match for Hymmen as we share the same passion for innovation and continuous development within the global flooring industry," said Dr. René Pankoke, CEO and President of Hymmen, adding that the innovations group "will support us on developing and further expanding the market for digital printing."

www.hymmen.com ■

Hymmen's patented digital printing and structuring technologies for flooring are now only available via an I4F licence

Sefar releases mesh product app for smartphones

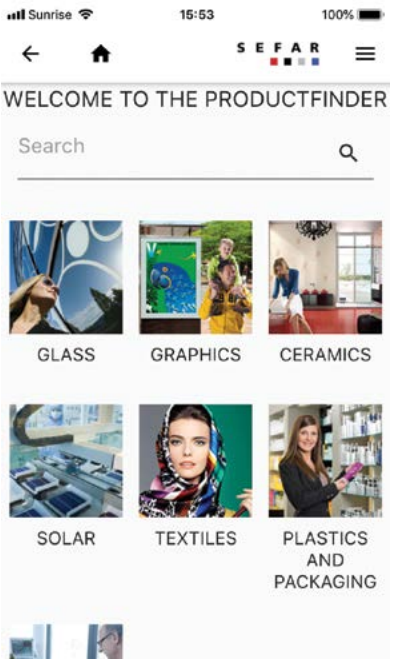
Manufacturer of screen printing mesh and accessories Sefar has produced a new Mesh App to support users in choosing the optimal screen printing mesh. The app is intended to be particularly useful for the younger generation of screen printers and also offers the sales force of Sefar's distribution partners valuable advice on the best mesh selection.

The app comprises four levels from which users make their selections. Level one is roughly divided into industries in which screen printing is used. The second level sub-divides relevant industry product groups. Level three describes the printing task and the fourth level, the intended colour system. After selection has been made on all four levels, a prioritised selection of suitable meshes is shown. Once the user has chosen their mesh type, its application-relevant specifications appear.

A slide-out sidebar menu offers additional information such as a brief Sefar profile, a description of industries covered, the company's mesh lines and range of accessories, and the contact addresses of its subsidiaries. For further information, there is a link that calls up the requested mesh line or the accessory on Sefar's homepage.

www.sefar.com ■

The Sefar Mesh App can be downloaded free of charge from the Apple App Store or via Google Play



Sefar's product finder app is designed to simplify the process of choosing a screen printing mesh

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