

# EXTENDING Opportunities

What does digital growth mean for carton, tube and flexible package printing?

PACKAGE PRINT WORLDWIDE

# PPW

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SEPTEMBER 2011 ANALYSIS

ISSUE # 1

## PACKAGING DESIGN

## NEW TECHNOLOGY

## BRAND PROTECTION

# Migration DEBATE

The demands on the packaging industry to design and produce food compliant solutions



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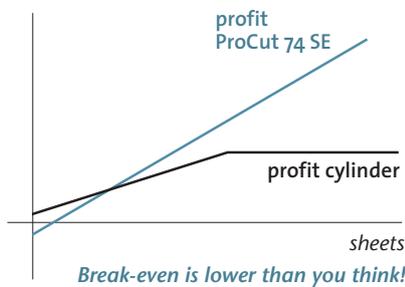


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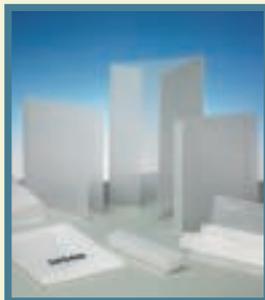
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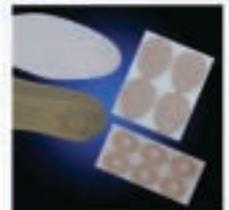
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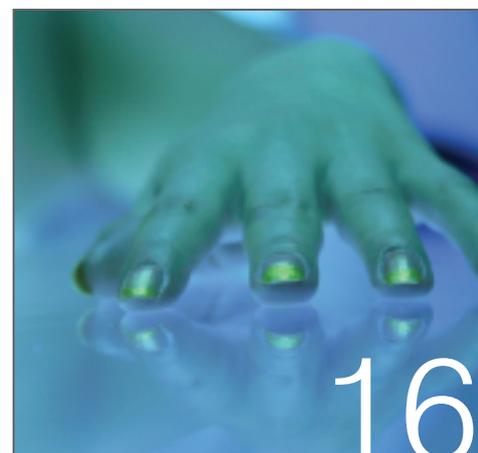
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# PPW intro



## Responding to a changing market

On behalf of the team at Package Print Worldwide, I am pleased and privileged to welcome you to the first issue of this journal. It is launched on the back of our very successful E-Newsletter, which began life back in October 2010, and is now issued twice-monthly.

The package printing industry is a world of fast-changing dynamics, from the awakening of consumer demand in the under developed markets, to the sophisticated marketing tools used by brand owners and major retail outlets to gain and maintain market share in the developed countries.

Today's market for printed packaging is part of a long and complex workflow that stretches from raw material to retail outlet, and on through to re-cycling. PPW is designed to cover this workflow and act as a forum where new ideas, products, applications and solutions can be exchanged to enhance business prospects.

With the growing trend towards short and medium run work, package printers are looking more closely at their production capabilities. Where print quality and fast turnaround are 'the accepted norm', and price is often non-negotiable, PPW brings you the latest thinking from suppliers, designers, printers, and converters, and shows how they are responding to the needs of a changing market.

The launch of the PPW journal coincides with Labelexpo Europe 2011, and its first-ever dedicated Package Print Zone. Complementary to the main exhibition, the Zone marks a significant crossover point between labels and the broader world of printed packaging. Full details of the Package Print Zone, and its associated seminar program, are printed elsewhere in this publication.

The development of Package Print Worldwide is our way of responding to a market where traditional thinking and methods of production are being swept away by a wave of new concepts. The companies that respond best to these changes will drive the future of the industry. To keep up to date, stay close to PPW!



**Nick Coombes**  
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Changes in demand for newer carton designs produced on standard machines



With an increase in food packaging migration alerts highlighted by several high profile product withdrawals from supermarket shelves, the issue of designing and producing compliant food packaging has become a hot topic, writes Felipe Mellado, CMO, Sun Chemical



# Focus on food packaging safety



Four layers of packaging: primary inner wrap, primary outer wrap, secondary packaging (collation wrap) and tertiary packaging

**What is migration?**

Migration from food packaging refers to the transfer of unwanted substances from the packaging to the packaged foodstuff itself. These changes are not always picked up by odor or taste tests, and are usually found by chemical analyses. The migrating substances can come from a variety of sources including the packaging substrates, inks, coatings, adhesives, the printing press itself or the environment in which the raw materials, work in progress or the finished printed pack are stored. The use of good packaging design and good manufacturing practices are therefore critical to reducing the risk of unwanted migration of packaging components.

**What legislation exists around control of migration?**

In Europe, packaging that is intended to come into contact with food must meet the requirements of EU regulation (EC) No 1935/2004. The guiding principle of this legislation requires that food packaging should not transfer materials to the packaged goods in quantities that bring about a change in nature, substance or quality of the food and must not be injurious to health. In addition, producers must operate using Good Manufacturing Practice (GMP) as defined in EU regulation (EC) No 2023/2006. More recently, the Swiss Regulatory Authorities have introduced an Ordinance, which specifically outlines lists of raw materials that can be

used in food packaging inks. Each listed substance has a migration limit against which the downstream stakeholders are expected to assure compliance.

Whilst legally this Ordinance affects only the inks and packaging within Switzerland, its effects are felt throughout Europe and beyond. In fact, many customers and brand owners outside of Switzerland expect inks and coatings to comply with these requirements. At the start of 2011 the German Authorities also declared their intention to implement their own National Ordinance on inks for food packaging. Both sets of legislation are fully anticipated to form the basis of an EU-wide legislation in coming years.

*The Expected Migration Performance assumes that the inks or coatings are used correctly using Good Manufacturing Practices and appropriate low migration printing protocols*

*\*\* Based on standard EU Food Model 600cm<sup>2</sup> wraps 1kg of food (ppb = µg/kg food)*

Sun Chemical Brand Name	Curing Technology	Process	Application	Expected Migration**
SunCure ULM	UV	Offset	Paper & Board	<10ppb
SunCure FLM	UV	Offset	Films, Foils, Paper & Board	<10ppb
SunCure QLM	UV	Offset	Films, Foils, Paper & Board	<50ppb
SunCure Starlux	UV	Offset	Non Food Packaging	>50ppb
SunBeam ELM	EB	Offset	Films, Foils, Paper & Board	<10ppb
SolarFlex LM	UV	Flexo	Films, Foils, Paper & Board	<10ppb
SunPak LMQ	Conventional	Offset	Paper & Board	<10ppb
SunPak Diamond	Conventional	Offset	Non Food Packaging	<60ppm
SunPak Low Hex	Conventional	Offset	Paper & Board	<60ppm
SunPak FSP	Conventional	Offset	Paper & Board	<50ppb

**Responsibilities**

As a responsible and leading player in setting the standard for good practices in the packaging industry, Sun Chemical takes its product stewardship role in the packaging design and production workflow very seriously. The company strongly advises the industry to adhere to all published guidelines and regulations covering food packaging and to use only appropriately selected inks and other consumables. It has always been committed to anticipating changes ahead of time as well, and complies with regulations relating to the chemical industry at large.



Low migration ink mixing

### Simple Choices

Printing compliant food packaging is often seen as a minefield of complex legislative decisions. However, the brand owner, print specifier and print converter have some simple choices to make. A risk assessment should always be completed at the initial stage of pack concept design. If a migration risk is anticipated, then the pack either needs to be tested to prove its migration performance and appropriate steps taken to reduce the risk, or low migration inks and coatings should be used to avoid any worries. If the testing route is chosen, and it is proven that appropriate barrier performance is provided by the substrate, then the designer has a choice of using standard inks and coatings or intermediate migration solutions. If unacceptable migration is present, then either a designed-in functional or absolute barrier to migration, or low migration inks and coatings are required. It really is that simple. The economics of the choices are another matter though. Weighing up which route is the cheapest can be complex, but the bottom line is that the whole of the packaging supply chain, from brand owner to packer/filler, needs to work together to ensure safe packaging for the consumer.

The company has worked for many years on understanding the factors affecting migration and has developed a complete portfolio of low migration inks and coatings to support the packaging chain across a range of print processes and technologies.

Mostly, printing and converting companies are expert in selecting appropriate procedures and practices in line with good manufacturing practice in the production of suitable printed food packaging. As a result, the packaging industry has a first class reputation for the production of high quality and safe food packaging. By continuing to strengthen our advice and guidance to printers and converters, in line with the inks and coatings industry association EuPIA (European Printing Inks Association) and Good Manufacturing Practice guidelines, the company hopes to further minimize the risk of migration problems arising in the future.

It is company policy to make best practice advice available to its customers in all aspects of the use of printing inks and coatings for all applications. The company has found in the past that some printers were not using practices and procedures that would minimize contamination during production, and as such it was felt that there was a need for better information and awareness, which the company's latest best practice guide provides.

In 2004, Sun Chemical introduced the first edition of 'Print for Packaging – A Printing Low Migration Best Practice Guide', which has proved to be a very useful and popular document for printer converters and end users alike. Some 5000 copies of this document have been distributed to date. The guide was last updated in 2007 and a third edition is now available that reflects the current packaging market situation, including the impact of the new Swiss Ordinance legislation and REACH. This new guide was officially launched at Interpack in May 2011, and like its predecessors, is proving to be a popular reference book.

For a copy of the guide to low migration printing or further information regarding Sun Chemical's portfolio of Energy Curable ink and coating systems, please contact: [packaging@sunchemical.com](mailto:packaging@sunchemical.com)



Food packaging showing primary inner wrap (flow wrap) and primary outer wrap (folding carton)

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People & Print

# Digital, POD, package printing provides rapid growth opportunities



Mike Fairley reviews the current use of print-on-demand digital presses now being used for carton and flexible package printing, pot lids, tube and pail decoration, and highlights some of the leading press solutions

There can be little doubt that digital printing has arrived and is here to stay. Over the past seven years there have been more than 1,200 narrow-web digital, print-on-demand, color presses installed worldwide for the production of self-adhesive labels alone, as well as many now being used regularly for high quality printing or decoration of folding cartons, shrink sleeves, flexible packaging, tube laminates, pot lids, pails and buckets.

More than 250 new installations are being made each year in light of the impact and capability of the latest generations of digital presses introduced since 2003. This is expected to rise to over 400 a year by 2015, with perhaps as many as 15 to 20 percent of these being used for package printing or pack decoration applications.

What seems certain is that digital, print-on-demand, label and package printing is meeting current cost cutting and lean manufacturing initiatives as well as creating opportunities for multi-language versions, increasing customization and targeted marketing, such as packaging for retail chains or for seasonal products. Having the capability to offer mass customized packaging, with text and images, gives brand managers a powerful tool for attracting new customers.

'Today's brand managers are looking for ways to add value and differentiate their brands,' explains Alon Bar-Shany, vice president and general manager, Indigo Division, HP. 'HP Indigo digital printing, with print quality as good as or better than flexo, enables brands to be quickly and easily refreshed and labels and packaging adapted quickly for seasonal promotions, special events or even different language versions. Many brand managers have also discovered the benefits of using digital printing for prototyping and market trials, where cost-effective test products may be produced on final substrates.'

Using digital printing enables carton producers to better manage their brand customers – improving sell-through with targeted design, while lowering capital expenditure, time to market and obsolescence. At the same time, brand owners using digital printing for their packaging work gain the ability to affordably launch new products and improve visibility on the shelves.

According to Jan De Vooght, global sales director for Agfa :Dotrix: 'Digital press technology allows endless print possibilities that are simply not financially practical with litho or flexo. A digital press easily handles late design changes and is the natural choice for short and medium run lengths owing to the simple workflow and plateless approach. With a digital press it is simple to co-brand packaging with the name of the retail outlet

or the name of a special promotion. It is a proven way to gain extra 'presence' in the battle of the shelves and increase sales.'

Jan De Vooght believes that the time for industrial inkjet press technology has already arrived. 'We had huge interest in our seminar at the recent Gulf Print & Pack expo. It highlighted the value of digital for the packaging segment, and provided Agfa's first Dotrix users in the region, LabelCo and Snoppies, both in Lebanon.'

As run lengths shorten, traditional litho and flexo can often struggle to meet the changing demands and requirements in packaging products. Digital technology is well suited to fast turnaround requirements, short deadlines, short run lengths, inventory minimization and waste reduction. With brand managers cutting production and inventory costs and waste, it is no longer a case of 'make and pack a product then sell it'. The speed of digital press technology means that 'sell it first then make and pack it' is fast becoming a new philosophy considered by brand owners and retail groups.

Other advantages of digital package printing include lower set-up costs than those for flexo/offset and gravure, and a reduction in capital equipment cost. Overall, digital packaging systems help to reduce cost, waste and inventory in the supply chain, offer digital security features and coding, as well as enabling printers to open up new niche markets.

Other benefits of digital printing to packaging and label buyers are fast response times, shorter supply chains, faster time-to-market and reduction of inventories and waste. A recent study by Karstedt highlights that brand owners are now on the verge of moving from mass production of packaging to an era of mass customization.

While digital printing was initially targeted at runs of 1,000 to 10,000 labels or packs, the latest digital presses are now regularly being used to print runs of up to 25,000, or even 50,000 and up to as high as a 100,000, depending on ink coverage. For many printers, digital regularly complements long-run production on their conventional offset, UV flexo or combination process presses, while Agfa claims its 650mm wide Dotrix Modular digital/conventional press line offers high quality printed packaging and a better ROI than conventional printing methods for short and medium run lengths.

Although the packaging market as a whole is growing steadily – and flexible packaging faster than most – on the digital front it is predicted that growth in electrophotographic toner-based solutions (HP Indigo and Xeikon) will eventually be surpassed by inkjet technology, which is more easily scalable and potentially faster. However, some quality improvements



Offset quality folding cartons printed on HP Indigo Electroink press

are still required before label and package printers adopt inkjet solutions on a large scale. Having said that, improvements in the pipeline for UV inkjet ink and technology are working towards offset-quality digital inkjet printing in the near future.

So where do the digital print-on-demand technologies stand today and who are the key players?

### Digital print technologies

Currently, there are calculated to be as many as 40 different makes and models of narrow-web digital print-on-demand color presses available on the market – with more on the way from China. Total installed base of all these makes and models is estimated to be more than 1,600 machines, with more than 80 percent of those currently being toner-based technologies. Leading players that have been developing areas of the package printing and decoration market include HP Indigo, Xeikon, Agfa, EFI Jettron, Xerox and Linoprint.

### HP Indigo

HP Indigo is leading the way with its Electroink liquid toner WS4500 and WS6000 web-fed presses, and the 5500 sheet-fed machine. Since its launch, well over 200 HP Indigo WS6000 digital presses have been installed at leading label and packaging converters in nearly 40 countries, enhancing their product offerings as well as their productivity and flexibility. These machines complement more than a thousand WS4500 presses in the market.

Transferring jobs up to 4000 linear meters (13,000 linear feet) or 120,000 labels from conventional printing to digital, the press can handle substrates from 12 to 450 microns, enabling a wide range of substrates to be used to create high value labels, shrink sleeves, flexible packaging and folding cartons, complete with variable data and accurate, reliable matching of Pantone colors.

For converters looking to enter new markets and add new revenue streams, as well as attract new customers or sell different products to existing customers, the HP

Indigo WS6000 digital press offers carton manufacturers the versatility to address these opportunities with fast turnaround, high-quality and streamlined multi-SKU production, on-demand and in short runs. The WS6000 is claimed to be more cost-effective than analogue printing on up to 80 percent of label and packaging jobs.

Complementing the WS6000 digital carton printing capabilities, HP Graphics Solutions partner, AB Graphic, has introduced a new model to its Digicon converting systems – the carton series – which converts short-run cartons and boxes using semi-rotary cutting and creasing. This semi-rotary solution means that the converter doesn't need to change cylinder sizes. Also available is a KAMA sheet-fed folding carton converting unit.

Either the semi rotary cut and crease unit is included as a module in the Digicon 2, or the KAMA unit is placed at the end of the converting line, after the rewinder with a loop box. That way, all the standard embellishments like varnish, foiling, can be used for both labels and folding cartons. Should the web be of cardboard, it will not be rewound but go straight to a KAMA unit. Alternatively, AB Graphic can supply a sheeter which will then allow the KAMA to remain offline and deal with sheets only.

Put together, HP indigo technology enables carton producers to offer their brand-owner customers a complete web-fed inline or offline carton production capability using all the benefits and new added-value opportunities provided by offset-quality digital printing.

HP Indigo demonstrate that optimization on a web is higher than on sheets (less waste), and that web-fed inline carton production is viable. The challenge is that folding carton producers are very traditional, used to dealing in sheets, printing with offset, etc, and, to-date, have been reluctant to move into digital printing. According to the pharmaceutical sector, it is generally 'open-minded' label converters that are seeing the benefits of establishing a one-stop shop for both cartons and labels.

In terms of flexible packaging the WS6000, with a longer frame, is more suitable for this application. HP is looking to add a few additional features to better comply with the demanding flexible packaging world. Since 76 percent of this market is for food, the FDA and related health rules have to be considered. HP digital printing does comply, but they also have on-going developments in the pipeline.

### Case study: HP

**August Faller, KG, has focused on printing folding cartons for the pharmaceutical industry for around 20 years.** The company operates at four production sites in Germany and also produces package inserts, labels and combination products.

Productivity increased after installing an HP Indigo WE6000 digital press and it was able to take on more short-run work for pharmaceutical customers. Workflow from prepress to finishing also improved with the new press. Excellent color matching for corporate identities is achieved with the press color management software.

### Xeikon

Xeikon has close to 300 presses now installed for self-adhesive label and package printing, or for transfer decoration of pails, buckets and tubes. Today, the Xeikon 3000 Series includes four digital presses: the entry-level Xeikon 3030, the Xeikon 3050 with wider web width; the high-volume Xeikon 3300 and the flagship model Xeikon 3500.

Based on open industry standards, the Xeikon technology seems to fit seamlessly into any production environment,



Decoration of flexible seamless tubes using the 'digitube' applicator introduced by Xeikon

increasing customers' efficiency and flexibility. The four presses all deliver the same print quality and are divided into two maximum web widths: 330 mm (13inches) and 516 mm (20.3inches), with each width available in entry-level or the higher productivity versions. Entry-level versions are designed to be field-upgraded to the wider and/or faster specifications.

The launch of the Xeikon 3500 in May 2010 addressed the need for more capacity by offering a wider print width up to 516 mm, making it viable beyond 4,000 linear meters. This closes the gap with traditional printing presses and has allowed Xeikon to fill a productivity gap. The press is also opening new applications in diverse market segments.

Like all Xeikon 3000 Series presses, the Xeikon 3500 is capable of printing on an unmatched range of substrates including self-adhesive films, unsupported film, paper, transparent and opaque foils, and paperboard with weights ranging from 40 to 350 gsm. The Xeikon 3500 utilizes Xeikon's QA-I toner, which meets all the applicable FDA guidelines for indirect food contact under room temperature as well as direct food contact for dry food substances containing no surface oil or fat.

In partnership with MOSS, a leader in container decorating technologies, Xeikon has also introduced the 'Digitube' applicator for decorating flexible seamless tubes, aluminum closures and similar articles. This heat transfer technology enables the decoration of a variety of plastic containers and others through digital printing technology. In the first stage of this process, the Xeikon 3500 prints the

exact numbers of heat-transfer images required for the decoration. In the next step, the roll of printed transfers is fed into the MOSS applicator which applies the label via a heat transfer process onto the container.

The result is a high-quality, digitally printed and applied decoration that is scratch and water resistant. In addition, it offers a higher flexibility as the decoration can be applied later in the supply chain, compared to screen and offset printing, where it must be printed at the beginning.

#### Agfa

Agfa's :Dotrix Modular UV inkjet press combines Agfa's single pass inkjet technology with Edale's traditional printing and converting expertise, to deliver an industrial and reliable digital solution. This modular approach means that the machine configuration is flexible and can incorporate a wide range of traditional technologies that include, but are not limited to: flexographic printing and coating, lamination, foiling, die cutting, sheeting, folding, embossing and slitting.

Digital print is achieved using the latest single pass UV inkjet technology. Up to six color bars containing drop on demand piezo inkjet heads are mounted in a fixed array across the web, and each head delivers up to eight levels of grayscale to maximize image quality. The UV inkjet provides excellent ink adhesion to a wide range of substrates including paper, film and board, as well as delivering strong, resilient and light fast colors. Available in six colors, the :Dotrix print engine covers 90 percent of the Pantone color range.

The combination of traditional flexographic printing technology with single pass UV inkjet means that a wide range of products can be printed and converted. Popular applications include: flexible packaging, folding cartons, yoghurt pot lids, labels, and point of sale/purchase.

The :Dotrix Modular prints 1209m<sup>2</sup>/hour on a 650mm wide substrate coil. This can be heavy 480gsm paper, 20µm flexible foil, shrinkable label, or any type of substrate up to 600-micron gauge. Unlike toner based digital press technology the inkjet :Dotrix has no repeating seam from the toner cylinder. The UV cured Agfa UV inks won't scratch, scuff or fade – even in outdoor applications. Owing to the modular concept converters can add flexo stations if there is a need to apply coating, varnish or flexo white or metallic effects to packaging.

#### Case study: AGFA

**Snoppies of Lebanon, a high quality Lebanese printer specializing in premium wrapping paper and shopping bag manufacturing chose :Dotrix for its future growth. For many years it has served the Middle East using flexo and litho but recently installed Agfa's :Dotrix UV modular digital press.**

'This investment allows dramatic improvements to speed, quality and efficiency' says MD, Ali Fleifel. ':Dotrix uniquely provides rich, glossy UV inks that enhance the personalized wrapping paper and high quality shopping bags on a range of substrates. We work at the top-end of the market so :Dotrix is the perfect solution.'

#### Case study: Xeikon

**Odyssey Printing of Tulsa, Oklahoma, uses a Xeikon press to produce customized golf ball boxes for dozens of country clubs, corporations and special events, such as tournaments and fund raisers.** It has over 100 templates for packaging that can be customized with logos and pictures and UV-varnished in-line with the press, then die-cut and shipped flat to Acushnet Golf – manufacturers of Titleist and Pinnacle golf balls – ready to receive the golf balls. Run lengths are under 1,000 and jobs can be turned around in just five days.

#### Xerox

Xerox has offered its Xerox Automated Packaging Solution (APS), a folding carton electrophotographic printing and converting system based around the Xerox iGen4 digital press since 2009. The APS on-demand modular packaging line for iGen3/iGen4 joins four components together into a powerful system for on-demand folding carton manufacturing. Consisting of the digital printing engine, coating unit, buffering stacker and die cutting – including Xerox's Freeflow print server and VIP suite – the system enables packaging volumes ranging as low as five and fewer to be printed on demand, efficiently and profitably.

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High quality, Xeikon digitally printed and applied decoration to pail

The press has a cut sheet size of up to 364mm by 572mm and a vacuum gripper-less transport mechanism – i.e. not a friction feed – which allows printing to within one millimeter of the sheet edge. Both paper/board and inks can be topped up on the run and speeds are up to 6,600 impressions/hour, or 110/minute.

Using a workflow enabled by the Gallop digital print packaging line jointly developed by Stora Enso and Xerox, the production line enables lower minimum orders, less waste, less storage, quicker time to market, and more secure printing. The total solution prints a precise number of cartons per job, cutting the risk of counterfeiters gaining access to legitimate packaging.

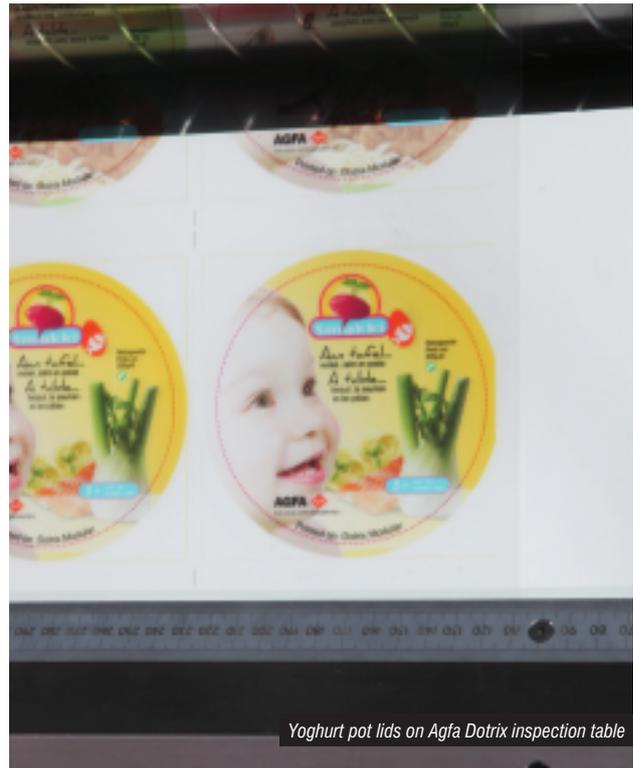
The Gallop line consists of the Xerox iGen digital printing press, an Epic coater, a buffering stacker line built by Stora Enso and a specially designed DC 58 die cutter. The die cutter operates at up to the twice the speed of the iGen4, so it can handle hot foil stamping and die cutting and still keep up with the printer. The buffering stacker line integrates the printing and coating section to the die cutter and allows printing to continue even if the die cutter is offline. Xerox claim to have some 50 iGens already installed in MENA and is experiencing increasing interest from commercial printers looking at packaging, particularly in pharma. The company is also getting a lot of interest from pharma end users, who want service providers to supply these JIT products, while Xerox can also install and manage these systems at the end user if required.

### EFI Jetrion

EFI Jetrion recently introduced its latest 4830LED UV inkjet system and a newly developed flexible ink set that allows printing on unsupported and heat-sensitive materials, including shrink sleeve, therefore opening new opportunities for label converters and package printers in the flexible packaging market. The company also offers a single-pass digital white targeted at printing on clear film and metallic substrates.

The press comes with advanced drop-on-demand (DOD) print heads with grayscale capabilities which deliver print resolutions of up to 1080 dpi (apparent) and giving near photographic quality. Web width is up to 229mm.

The flexible inks produce durable, shrinkable, flexible, and peel-resistant images enabling printers to meet demanding customers' expectations. This is made possible by the ability to increase short-run opportunities and profits by covering a



Yoghurt pot lids on Agfa Dotrix inspection table

broader range of flexible packaging materials supported by UV LED curing technology. The Jetrion industrial inkjet family – which includes the 4000, 4550 and 4830 models – enables converters to tap into newer, perhaps more lucrative services, such as shrink sleeves, localization, regionalization and personalized marketing. EFI Jetrion say that its systems lower the bottom line by eliminating plates, reducing labor and waste costs, alleviating inventory pressure and shortening turnaround times.

### Where next for digital printing

According to various independent market studies, the value of digitally printed folded cartons, flexible packaging, tube laminates, pails, pot lids, blister packs and labels is already in excess of two and a half billion euros, and growing at around 17 percent per annum. This rate of growth is expected to continue, or even grow faster, for at least the next four to five years.

While much of this growth has been achieved by label converters looking to complement their short-runs of versions, variations, personalized and quick turnaround label work with digitally printed packaging – often for the same customers – it is expected that the more traditional folding carton industry will increasingly look to a future with digital.

Wider, faster, litho and flexo quality inkjet presses, will soon be looking to compete with the large installed base of electrophotographic machines from HP Indigo and Xeikon, and with end-users already talking about mass customization and integrating digital into their packaging lines, the package printing sector will be forced to look at new application and market approaches that will be difficult to achieve with their conventional presses.

They may think that digital package printing is for the future. It's not. It's already beginning and certainly here to stay and grow. Just have a look at what's on show at Labelexpo this year. That will be a taster for even more and bigger digital printing technology that's in the pipeline for Drupa 2012 and beyond.

# The Power of Nature



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# The power of touch



**Dr Catherine Barnes, director of the Faraday Consultancy at the University of Leeds, introduces the concept of quantified touch and discusses why the 'feel of the pack' could improve consumer experience**

**A**lmost all packaging found in stores is regularly handled and touched by consumers, so why is the 'feel' of the pack rarely designed to improve the consumer's experience? Faraday, a technical consultancy, has been working closely with researchers at the University of Leeds to develop the Power of Touch, a process that delivers the technical specification of a surface that can convey brand values to the consumer.

We first learn to communicate through our sense of touch as babies, and arguably it remains our richest

means of emotional expression throughout life. Touch is an important emotion for all of us. In fact, it is one of the most effective ways to communicate and can deliver many different benefits:

- **Biological:** studies on infants link touch to healthy development. Touch reduces stress, releases serotonin and oxytocins, and reduces cortisone levels, which are all positive effects.
- **Communicative:** touching produces a series of neural, glandular, muscular and mental changes that we interpret as emotion.
- **Psychological:** touch can provide reassurance and comfort, and aids in the development of self-identity and self-esteem.
- **Social:** research has linked the quality of touch experiences to competence in interpersonal relationships. The ability to trust others, and understand the needs of others, is directly related to touching.

Touching products and packaging has a significant influence on our perception of them. When our fingers touch the surface of a pack, the many touch receptors in our fingertips trigger and send messages to our brain. These messages combine with our previous knowledge, and as a result we experience a series of emotions. Clearly, brand owners are keen to ensure that the emotions delivered by their products match the brand, but until now, there has not been a systematic way to design a surface to deliver a particular emotion.

When we touch a surface, we experience a composite of three different attributes: the substrate material, any added lacquers or textures, and the shape or form of the pack. Because substrate materials and pack shapes are frequently predetermined in the many packaging development processes, the main opportunity to engage the consumer is to add a texture or lacquer effect to the pack surface. The real challenge then, is to determine whether the chosen lacquer represents the brand accurately, and delivers the right experience.

One of the biggest challenges, when designing touchable surfaces, is that we have limited vocabulary to describe the tactile experience. Through extensive market research, brand owners know exactly what their consumers want, and this is usually expressed in emotional language, such as enjoyable, natural, or trustworthy. Most designers can instinctively imagine and draw a sexy shape, but how do they specify a luxurious texture? And, if designers struggle with this, how on earth are printers and converters able to respond to brand owner requests to improve the tactile properties of their products to 'make them more natural' or to 'improve the freshness'?

The research from the University of Leeds has unpicked the different aspects of the touch activity. It has resulted in the development of a process that takes emotional attributes as an input, and turns these into a set of technical specifications that enables the surface to be manufactured.

The first thing they analyzed was what happens when our fingers touch a surface. It is the touch receptors in our fingertips that actually experience the surface. There are three types of receptors in our skin that send messages to the brain. Mechanoreceptors sense pressure and distortion, thermoreceptors monitor temperature, and nociceptors are responsible for pain sensation. The most important ones are the thermoreceptors and mechanoreceptors. In turn, there are four types of mechanoreceptors:

- Merkel's Disc** – sensitive to edges, corners, and curvature.
- Meissner Corpuscles** – respond to stroke or fluttering touch.
- Ruffini Ending** – detect tangential forces generated in the skin.
- Pacinian Corpuscles** – sensitive to vibration.

By looking at when each receptor triggers, the researchers were able to identify that the most important surface design parameters for emotion generation were: friction (or stickiness), compliance (or stiffness), and roughness (or texture). In addition, they found that the temperature of the surface also impacts upon the perceptions.

The next step is to measure the surface. This has its own problems. The researchers needed to be able to measure a pack in exactly the same way that your finger measures the surface. Standard engineering measurements did not deliver this. So, the artificial finger was developed. The finger is designed to work in exactly the same way that a finger works, and is made from a bony core, soft tissue, dermis and epidermis. It even has a fingerprint, which was necessary to set up the vibrations. The finger provides a standardized measurement tool that can 'feel' a surface in exactly the same way that our own finger does. Instead of the messages being sent to our brain, the artificial finger sends the data direct to a computer. In this way, measurements of roughness, friction, compliance, and thermal conductivity are captured at the pack/



The artificial finger that has been developed

fingertip interface.

Once we have the actual measurements for what the artificial finger is feeling, we can do all sorts of things with the information. If we want to replicate a natural surface, like hessian or a leaf, for example, we can measure the leaf using our artificial finger. Any surface mimicking the leaf can also be measured the same way. When the results are compared, if they show a good fit, we can be sure that consumers will respond to touching the surface mimic in the same way as they respond to a real leaf.

There are many other ways in which the artificial finger can support the packaging development process. Another approach is to use it to check for consumer acceptance when a different substrate or material is being considered for the packaging, say for light-weighting or cost reasons.

However, perhaps the real power of the artificial finger is that it can be used to design new surfaces that deliver a specific emotional response. The researchers have developed a process that takes an emotion and delivers a technical surface specification. This is how the process works:

- 1 The first stage is to find out from the brand owner exactly what is the required emotion, and decompose it into a set of 'need statements' such as: 'makes me comfortable' or 'feels trustworthy'.
- 2 A set of a dozen or so sample surfaces are prepared, which vary in a known manner, for example different lacquers, substrates, and textures.
- 3 Participants in a self-report survey are then asked to touch the surfaces and rate them against the 'need statements'.
- 4 In parallel, these sample surfaces are measured using the artificial finger to understand fully the surface characteristics that the participants are experiencing.
- 5 Multivariate statistics are then used to find out the relationship between the surface measurements and the participant ratings.
- 6 The results indicate the 'ideal' surface that will deliver a particular emotional need.
- 7 The surface is expressed in terms of numerical values, which printers or converters can use to source suitable inks or coatings.

For the first time, there is a translation process which allows brand owners and converters to discuss and develop surface design. Faraday is now working closely with a number of brand owners and converters to achieve this process, and produce unique surfaces that consumer can really enjoy. This is the Power of Touch!

# Keeping pace with a changing market



**North America editor Danielle Jerschefske looks at how the mid-to-narrow web package printing industry has taken shape in recent years to produce anything the client may need to differentiate their products on the shelf**

**M**odern market dynamics beg for rapidly changing product decoration to enhance the shelf appeal for the excessive varieties available for a single product. The package printing industry has felt this shift over the past few years with lower job runs of many SKUs – still achieving high volumes in total.

Some flexible packagers have realized that the label industry's advanced machinery can bring production opportunities and improve profit margins, and are therefore shifting their investment dollars from wider web machinery to mid to narrow web configurations. More than half of the region's top 25 dedicated flexible packaging converters attended Labelexpo Americas, and the 2010 show experienced a 20 percent increase in flexible packaging attendees.

This shift leaves a potentially highly profitable gap in the market for label converters. It is for this reason that Labelexpo Americas 2010 included the dedicated area 'Beyond Labels: New Opportunities for the Converter'. Various products were on display for markets outside of traditional labels, which can be produced using the industry's highly advanced, dedicated narrow and mid web machinery.

These advanced machines are fully equipped to manufacture short-run packaging including flexible packaging, folding cartons, wrap-around battery bands and functional converted products, such as medical pieces and cell phone components that can diversify a label business.

Labels & Labeling's recent North America Label Converter survey, conducted in January 2011, revealed that over 40 percent of respondents are already producing flexible packaging, while nearly 20 percent are converting folding cartons and 57 percent are producing some sort of ticket or tag. (see chart.)

Paco Label, a Texas-based converter, installed a Nilpeter FA-3 last summer, expanding its capabilities to include cold foil as well as rotary screen. This gearless press can handle a wide range of packaging materials with its servo-driven in-feed, and servo motors on all print units. It is equipped with a mid-feed pacer, and the latest P2P automatic register control system.

The installation will allow the converter to take on more complex work and break into the market for highly decorated food and beverage packaging. Paco Label is pleased that the press is able to achieve the quality needed to compete against both gravure and offset, yet with the narrower web, can produce work more economically that's difficult for its competitors to match.

Dwyer Group in California made a significant investment to move into process color offset shrink sleeve label production by installing an 8-color 38 inch RDP Marathon IVCO press at its Pennsylvania location, and an HP Indigo WS6000 digital press in California, within 12 months. The company is using the digital

press to create prototypes to drive sales for the higher volume offset press. This dual platform meets Dwyer's business model of just-in-time delivery. Initially, prototyping allows the converter to show the quality of the label it can produce, but significantly, the system increases Dwyer customers' overall speed-to-market, compressing the time-line down to two to three weeks from concept to consumer.

Hammer Packaging, based in New York, was the first North American customer to invest in Heidelberg's new CX 102 Speedmaster. The CX 102-8+L is equipped with a CutStar roll sheeter and Prinect Axis Control color measurement and control system. Hammer Packaging selected the press primarily for its speed and efficiency in printing different film stocks. According to the company, the addition of CutStar will make the printing of film even more cost-effective, because of the way it controls the sheet as it is fed into the press. The converter is a high-volume producer of premium seed packets, and supplies leading brands like Gatorade, Coca-Cola and Pepsi.

## MIS

A number of the market's largest, multi-site converters – Multi-Color, WS Packaging and York Label – have invested in EFI Radius MIS/ERP software systems that can manage the production of a multitude of product lines effectively. The EFI Radius solution is designed to enable an end-to-end, intelligent and optimized management and production workflow for label, flexible packaging, converting and folding carton businesses. Its recent roll-up into the EFI portfolio places the supplier closer to the label converter's ear, and the most recent acquisition of Prism highlights how the business is looking to develop more solutions for medium to small package printing operations.

## Digital

The 2009 recession brought total cost evaluation to the forefront of CPG and brand owners' decision making processes, which gave digital printers a shoe in. Numerous small and medium-sized label converters have found advantages in the packaging market by selling on total delivered cost, reduced inventories, and improved response time.

Improvements made to market leading machines have allowed their users to produce labels and packaging profitably in volumes that most converters consider medium run lengths – and packagers consider short run. Interestingly, while the sweet spot for the HP Indigo WS6000 is considered to be 15-17,000 feet (4,500 – 5,000m), jobs are being regularly clicked at 40-50,000 feet.

Vibrant Graphics in Wisconsin manufactures in-mold

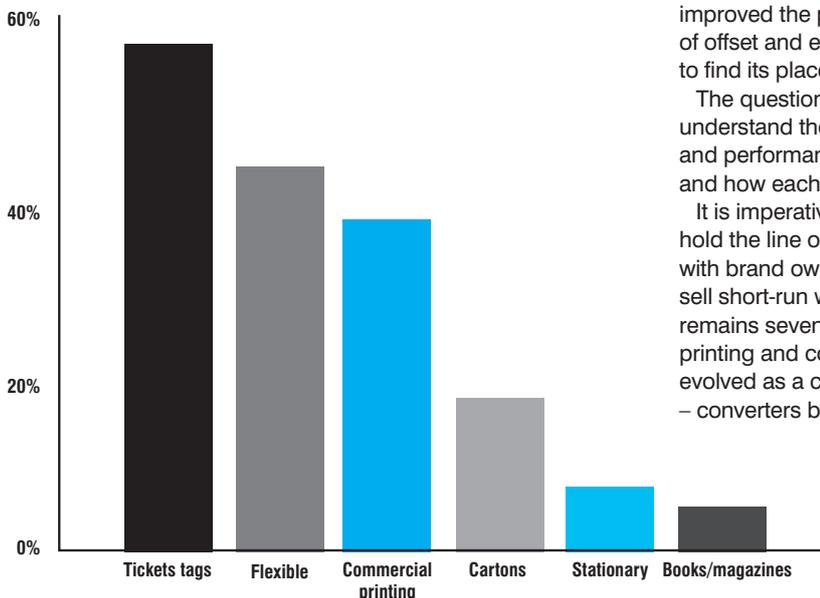
labels with a thin 0.5mil laminate on an HP Indigo WS4500 digital press, which has given it the ability to hit the mid to small size markets with IML service. The converter's core competency is the coating. Yet, innovation is two-fold, since the business was able to capture this new in-between sector, giving the market something that it had never had access to before. Prior to Vibrant offering IML, the decoration type was exclusive to long run work and could only be found in the wider format (52in) arena.

**Finishing**

The converting process offers the greatest potential for differentiation, and sometimes the most innovation, when it comes to expanding business beyond a typical label. Delta Industrial's Spectrum digital finishing machine can be customized to convert a variety of materials. It can offer cut and place web capabilities, and is considered to be 'plug-and-play'. Vibrant Graphics uses Delta equipment, because of its versatility and flexibility, which allows the business to be flexible when reacting to customer needs. The Spectrum is a semi-rotary system that allows tension and speeds to be changed quickly, and includes a die station for whatever configuration is required.

RotoMetrics opened a new Converting Technology Center at its headquarters in Missouri to demonstrate its advanced die cutting and modular processing equipment. It hosts the new 660 mm (26 inch) Rotary Processing Module, designed

**Other printed products produced**



to convert a wide range of materials from flexible packaging, to folding cartons and pressure-sensitive labels. The module can perform creasing, die cutting and embossing with solid or flexible dies in widths up to 864 mm (34 inch), and still provide the accuracy needed to compete in the market for re-sealable flexible packaging.

**Leveraging multi-platform**

With design life-cycle decreasing rapidly, and increased demand for individualized product marketing, it appears that the best way to service the dynamic needs of brand owners selling products to the 'socially plugged-in' consumer population is to establish a multi-level platform that allows the flexibility to produce anything the client may need to differentiate their product on the shelf, effectively and profitably.

Most of the modern 'conventional' presses are supported by advanced digital servo drives, internal software, and advanced design to help converters address CPC's efficiency needs while boosting margins. High Definition digital printing plates have improved the print quality capability of flexo, challenging the likes of offset and especially gravure, while digital printing is beginning to find its place.

The question is not, 'which process is better'? You need to understand the differences in each process, and their capacity and performance restrictions. Only then, can you determine when and how each one is used.

It is imperative that, as this trend continues to evolve, converters hold the line on pricing, and sell on the opportunities they have with brand owners. In some cases, converters have been able to sell short-run work at 20 percent more per unit but the total cost remains seven percent less. The shape of labels, packaging, printing and converting has adapted to the way the world has evolved as a consumer. There is no doubt it will continue to do so – converters beware!



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# 3D Designs on Packaging



**Jan De Roeck, director of Solutions Management at EskoArtwork, looks at how short runs can be made more attractive by speeding up the packaging production process and illustrates this with a case study on Kärcher's products**

**P**ackaging has just a few seconds to grab the attention of prospective buyers. That means packaging has to work harder and faster in today's highly competitive market. Branding has to be easily identifiable, and shelf impact is vital in the daily battle to retain existing customers and win new ones.

Packaging is undoubtedly essential for success. 30 percent of all profit growth originates from product launches. However, 70 percent of all new-to-market offers fail. Getting the packaging right is an essential element in any product's success. It is worth noting, too, that 70 percent of brand selections are made in store and 68 percent of buying decisions are unplanned.

Brand owners have a fickle audience to constantly engage with and are always looking for ways to differentiate their products or develop customer loyalty.

Re-designing packaging used to be an expensive way to inject new energy into a brand. That is no longer the case. A combination of market trends have culminated to provide leading blue chip manufacturers with the opportunity to re-invigorate much loved brands and launch new ones.

## Short runs for long gains

Short run packaging today is becoming more and more attractive. Advances in digital printing technology, and faster make-readies on litho presses make short-run production a suitable solution for many marketing efforts. Manufacturers can

produce cost effective, short, versioned – even limited edition – runs, and shelf impact can be enhanced by coating and foiling technology developments.

Developments taking place in pre-press are proving to be another vital and cost effective tool in helping brand owners design and implement packaging solutions with desired results.

## Speed up the packaging process

Too often, packaging can be a last thought in the production process. A lengthy approval cycle can detrimentally impact the final shelf appeal. This is why we have designed software that helps to speed up the process. Packaging professionals use the software to generate life-like in-store visuals. At the same time, brand owners have 24/7 access to the latest versions for the fast-tracking of approvals.

## Portfolio for packaging success

Tools have been developed to help with structural design, graphic design, virtual prototyping, real prototyping, and online collaboration, with a portfolio that includes, among others, ArtiosCAD, the world's standard structural design software for packaging design. This product comes with dedicated tools specifically designed for packaging professionals.

Another product, DeskPack, which was developed to support Adobe Illustrator CS and Adobe Photoshop CS, is used to enhance creativity and increase productivity, while WebCenter is a 24 / 7 global communication, secure internet-based view and approval service that allows information to be stored centrally and shared globally.

## Why brand owners love WebCenter

Kärcher, the world-leading supplier of cleaning solutions and manufacturer of high-pressure cleaners, found that WebCenter allows them to speed up the packaging production process by 40 percent, bringing improved efficiency to the brand owner's online packaging processes and communication. Kärcher quickly realized that WebCenter freed up more time for creativity and reduced time to market.

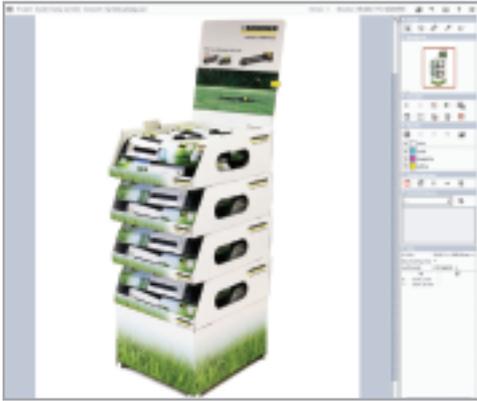
85 percent of Kärcher's products are five years old or less, and every new or redesigned product requires packaging that follows the corporate design guidelines. At the same time, it has to convey complex technical information and product benefits at a glance. It also has to stack on pallets, and pass a series of rigidity tests, to prove it can protect the product from damage on its way to the customer.

## Designs on speed to market

The Kärcher design team creates or updates around 600 items of packaging every year, managing about 1,800 different packaging products, including boxes, labels and POS displays. Previously, it would write up, edit, scan, fax, and print packaging requirements and product management briefing documents, using standard office applications. Drafts and



*Folding boxes are one of the most popular packaging solutions for Kärcher products*



A display for a garden sprinkler as shown in WebCenter: project team members can add their own comments

changes were then emailed back and forth. The result was a time-consuming and costly manual process, as documentation filled thick folders, emails were printed for archiving, and data burned to CDs.

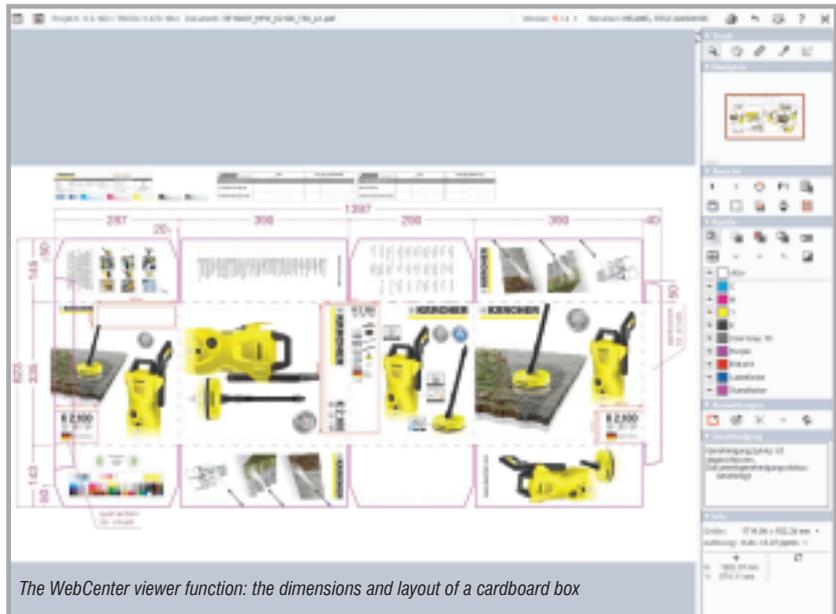
WebCenter allows Kärcher to meet the demand for shorter time to market, because it allows more time for the creative phase and offers greater transparency, increased standardization, better collaboration, faster processes, a simpler deadline structure, fewer review cycles, fewer errors, complete archiving, and reduced costs.

### 3D possibilities excite brand owners

A cost efficient process and increased speed to market are the direct results of the solutions we provide. However, what brand owners are most excited about is new software that enables the creation of 3D designs. Studio, for example, is a plug-in for Adobe Illustrator that brings interactive 3D packaging design to life. Studio Toolkits, an application for flexible packaging, enables the realistic building of models in just a few minutes. Visualizer creates realistic digital mock-ups, including print effects like embossing, hotfoil, metalized inks, and different substrates.

### 3D for efficiency

Instead of offsite meetings, or waiting for costly mock ups to be prepared and despatched, brand owners and decision makers can now view the product remotely. They can watch the packaging rotate through 360 degrees, so the whole impact can be fully appreciated, and check how it will look on the shelf, next to existing and



The WebCenter viewer function: the dimensions and layout of a cardboard box

rival products. Placed in a real life context, the brand owner can appreciate what the consumer will end up experiencing – relative to all the other brands on the shelf. They can also see how the secondary packaging will fit on a pallet or in POS material.

### 3D as quality assurance tool

3D can also act as a valuable quality assurance tool for the brand owner. It can be used to pick up errors during the early stages of the design, which saves considerable time and waste. It can be a powerful prototyping tool too, allowing creative packaging ideas to be shared with the brand owner early in the process. This allows them to get feedback quickly and effectively.

Virtual mock-ups offering hyper-realistic visualizations can be communicated in the same way, saving both time and the costs of expensive physical prototypes. All of this enables faster and better decision-making and dramatically

shortens the time from concept to final design, resulting in a faster time to market.

### Delivery quality through streamlining

Aside from aiding creativity and facilitating a greater level of input, these solutions also introduce huge efficiency gains by streamlining and automating all the packaging-related processes and procedures. Automation can be used to iron out all workflow inefficiencies, and reduce the amount of human touchpoints, which means staff can concentrate on more profit generating areas of the business.

Once workflows are streamlined and most of the repetitive processes automated, the risk of errors will be reduced significantly, and costly reworks will become a thing of the past. This ensures a consistent level of quality is delivered in the shortest amount of time, enabling new products to be taken to market faster with a higher, more consistent level of quality.

### Integrate all systems

To maximize the efficiency gains, all the packaging-related processes should be integrated into the brand owner's existing new product introduction (NPI) processes. If these are supported by a dedicated product lifecycle management (PLM) system, ERM system (such as SAP) or simply an in-house solution, then full integration of these tools with the existing system is also important.

With the processes and systems integrated, there is the opportunity to centralize all data. In many companies, data is still being input manually at different stages of the process. This practice is prone to mistakes, leading to wasted time and material. An integrated system enables data to be entered once and then re-used from the centralized database throughout the whole workflow.





*The Nilpeter **MO-4** is designed for short and long run value-added combination offset printing*

**Jakob Landberg**  
Sales & Marketing Director, Nilpeter A/S



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A variety of printed packaging can be produced on an offset press

# Litho technology – printed packaging’s flexible friend



**Adam Robotham of manroland UK assesses the latest developments in sheet fed offset production and explores how the different package printing processes can all add something positive**

Over the past decade, printed packaging – like most sectors of the broader printing market – has undergone major changes as it works hard to address the demands of an ever changing and fast paced industry. Consumer trends, the constant and often conflicting calls from brands and retailers for more environmentally friendly packaging solutions which are also cheaper to produce, and the move towards shorter print runs, have all led package printers to re-evaluate how they manage the packaging production process and the technologies employed in it.

Both narrow web flexo and cut-sheet digital printing technologies offer the package printer opportunities for diversification and growth in niche sectors. However, I would argue that those who claim either of these technologies will have a serious impact on litho’s dominance in packaging in the short to medium term, have

failed to take into consideration one fundamental truth: that litho technology has not stood still over the last decade. In fact, rather than being left behind by the digital printing sector in particular, as some pundits claim, manroland and all litho press manufacturers, have worked extremely hard, listening to customers and developing pioneering technologies to ensure today’s packaging and carton presses offer the highest level of productivity, quality and flexibility available.

## The latest in litho

Although both digital and narrow web flexo technologies have made evolutionary advances in recent years, litho press manufacturers have also made significant innovations in prepress and on-press production. For example, huge reductions in make ready times have been



*These samples were foil enhanced and embossed inline*

achieved in just a few years, and a multitude of automated on-press color, quality and process management software and tools have been introduced – all of which have actually led to litho presses becoming more competitive in this market, and a very attractive proposition to the modern package printer. There are also many sectors of the package printing market that will require the ‘highest of high’ print quality for a long time to come, so, although digital has become much more advanced, it still isn’t quite there for those at the top end of the market.

When you add to this the diverse range of substrates that can now be run efficiently through a litho press, you have a technology with a level of flexibility that is unparalleled in the packaging sector. Recently, one of our packaging customers in Germany began printing 1.6 mm solid board on his Roland press. This is unheard of, and opens up many more opportunities for this company and others who invest in similar technology. In short, all of this means litho is the most effective printing technology to span the broad spectrum of creative solutions, and offers a level of versatility that other technologies can only aspire to.

Last year, we launched a press that can print up to 18,000 sheets per hour, and is directly targeted at the packaging sector. When you add this to manroland’s award-winning DirectDrive press, you can appreciate that we have a formidable portfolio for the packaging and carton sector. In the past few months, we have secured orders from two leading UK packaging converters, Kingston Carton, and Qualvis Packaging, both of whom cited the developments in litho technology as the reasons for their choices.

#### **Get ready to make ready**

If you had told a carton printer as

recently as five years ago that he could make ready in six minutes, he would not have let you in the door. Yet, this is exactly what we have now with our DirectDrive press following the introduction of a timesaving six-minute make-ready solution to the folding carton industry. By combining our multi-tasking DirectDrive technology with its RolandColor ink process, package printers can now reduce make ready times by more than 60 percent. Combining the two technologies offers zero make ready on the printing units and a flood coat on two coating units. A UV over-primer and offline plasma treatment on the folder-gluer also ensures no more cutting of coating blankets. The six-minute make-ready incorporates simultaneous plate changing with the washing of impression and blanket cylinders and there is also no need to wash ink rollers or ink ducts.

#### **Drilling down on run lengths**

While it is true there is a trend in the sector towards declining run lengths, the detail behind the statistics tells another story. Overall packaging runs are reducing, but generally they are coming down from hundreds of thousands to tens of thousands, so are still too long for the current digital presses to compete effectively, especially from a cost per unit perspective, let alone quality and speed. As the packaging sector becomes generally more cost conscious, the major challenge facing digital manufacturers will continue to be how they can bring the cost per unit down for the package printer. Even at the very short run end of the market, the advances highlighted above have led to cost effective run lengths on litho presses reducing to the point where some printers can compete with digital on run lengths of just a few hundred sheets.

In many instances the ‘click charge’

model, a part of many digital offerings, will need to be re-evaluated for the package printing market, as, apart from the commercial implications, it is perceived as a manufacturer’s royalty on the success resulting from a printer’s drive to bring business in.

Currently we see the greatest threat to package printers with litho technology is not from narrow web flexo or digital technologies, but from litho printers currently in the commercial market taking best practice from the sector where pricing pressures have been acute for many years, and transferring these into production techniques for the packaging sector. In fact, our own anecdotal evidence from across Europe confirms this trend. However, what is especially interesting is that many of them are actually using their B2 presses to target the packaging sector, and keeping their B1 presses free for the commercial print sector. As an example, in the UK commercial printer, Potts Printers has combined its experience in the commercial print sector with the flexibility of a litho press to build a successful venture in the packaging sector.

#### **It’s about complementary technologies**

I have no doubt that both the narrow web flexo and digital printing processes offer the package printing market something positive and provide packaging companies with the opportunity to explore and exploit new sectors, which can only be good for their businesses and profit margins. Evolution is important if any market is to survive and indeed thrive, but, at manroland, we believe it will be a long time before either of these printing processes makes serious inroads into the market. Litho technology has not stood still over the past few years, and when I see what is being conceptualized at the moment in our R&D facilities in Germany, I’m confident it will not be standing still for the foreseeable future either.

Perhaps the most important point however, is that printers, manufacturers, and the industry in general, should not see all these technologies in competition with each other, but rather as complementary, with all of them suited to particular jobs and opportunities. We all have an interest in seeing and supporting a strong, vibrant packaging sector that is confident in its ability, and able to compete effectively in the market place. That is the key to a positive future.



# Application of laser processing in modern flexible packaging



**Frank Wagner a director at MLT, discusses the changing market for customized applications with filmic substrates. Laser technology is predicted to become increasingly important in the packaging industry**

**T**he original concept for this form of laser processing was for micro perforating cigarette tipping materials to create the cool draw concept. This remains a current market, but over the past 10 years or so, technology and machine development has also focused on other industrial processes such as perforation, scribing/scoring, and marking applications that are already in use and continuous demand worldwide, particularly in the area of flexible packaging.

Customers require turn-key, tailor-made solutions for their packaging needs, not only in relation to the laser process and machine configuration, but also with technical and specialist advice regarding the necessary extraction and filter system, which is a very important topic in the food and hygiene market. At MLT, we offer customized laser solutions based on all key components both offline, at the film producing and converting process, and online, on the packaging machines.

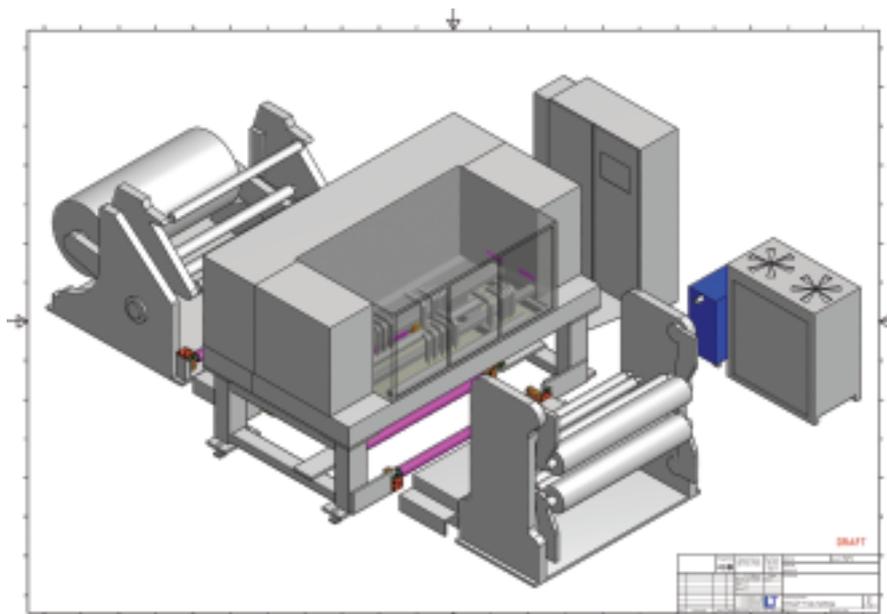
Using a unique high speed rotating polygonal mirror it is

possible to deliver maximum laser power for perforating applications across a web of material using only one laser. The speed of the mirror and subsequent focus of the laser is set according to web speed, so that the holes are round, not elongated. A computer program also allows the holes to be positioned in register to the printed material.

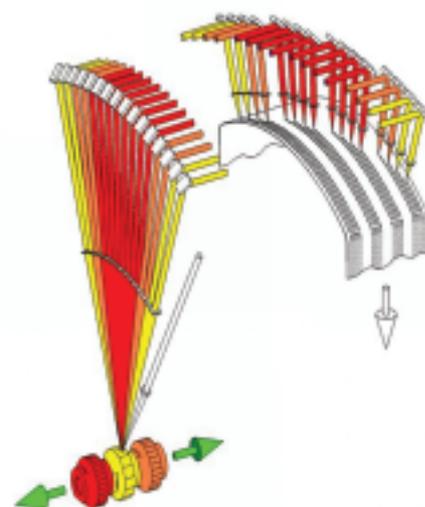
## **Micro-perforation**

Web material Laser Perforation Systems can also be used to create micro holes for Modified Atmosphere Packaging (MAP). This is especially applicable for flexo or gravure printed film materials, and is a solution commonly used for the packaging of fresh and perishable goods such as vegetables, lettuce, or herbs.

MAP of fresh food produce requires a completely different approach by the packaging industry, which is used to developing packaging with barrier properties that are



MLT integrates its laser assemblies in or on the slitter rewinder section



The laser fires against the fast rotating polygonal mirror directing full laser power across the web.

designed to exclude atmospheric oxygen, and prevent migration of any component within the package to the outer surface of the packaging material.

Fresh produce, such as salads, fruits and vegetables are to some extent alive for a specific shelf life of the product, and therefore technically still require oxygen for their metabolism. Conventional flexible packaging, with regular barrier properties, has proved to be unsuitable in most cases. An alternative type of packaging is required, whose gas transmission properties are precisely matched to the gas out requirements of the product.

As the industry for freshly supplied produce has grown larger and more sophisticated, so have the requirements from the packaging. Films with holes or pores admit oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) at similar rates. Therefore, the ratios of gases that can occur inside these packages are limited. It is impossible to achieve low  $O_2$  (one to five percent) without accumulating high  $CO_2$  (15-20 percent). These films are therefore applicable only for those products that tolerate high  $CO_2$ , without experiencing premature decay.

Micro-perforated films offer the possibility to tailor the Oxygen Transfer Rate (OTR) to suit the produce to be packaged. The holes are typically from 50 microns in diameter, and can be spaced at the required pitch. Perforating speeds up to 400 m/min are possible, with our own unique MLT optical multiplexing technology used in MAP applications.

### Laser scanning

So called scanning laser systems can run at high speeds, if compared with punching/die-cutting systems, producing 'macro holes' as a simple package airing system, for example Flow-Wrap of trays or pop out windows. This type of scanner technology enables film processing at web speeds of up to 200 m/min.

MLT Laser Scribing/Scoring systems can process all established mono and multilayer film combinations, offering both an offline solution for the film slitter/rewinder process, or an online solution during the actual packaging process. This enables defined material/film weakening in a specific location of the final package.

Typical examples are the Easy Opening solutions for instant products, such as coffee, soups, and pet food, which increasingly prefer the package to be opened without a tool or tear strip. More complex opening functions for convenience food applications, such as the defined/timed opening of microwave packaging during heating, are still to be properly established in the market.

In order to achieve an Easy Opening feature, materials can be processed in Machine Direction (MD), Cross Direction (CD), or in all variations of Free-Form contour scribing. Laser Scoring/Scribing can also be implemented to create paperboard container fold lines, and the selected weakening of materials can be adjusted with a high level of precision, ensuring the barrier properties are not damaged during the scribing process.

### Laser marking/security systems

Laser marking systems are also used as solutions for product safety and anti-counterfeiting. Web materials, and other substrates with smooth surfaces, can be marked either on-the-fly or in the interrupted-cycle process, which enables the application of labels, security marks, barcodes and number combinations. A classic example is the safety code marking of cigarette packets.

In addition to applications in the packaging and food producing industries, MLT and other manufacturers attract interest from diverse markets where the demand for quality and product safety has increased to a point where only laser technology offers a solution.

An integral part of the work in packaging is the constant development and customization of the systems according to the customer's wishes and needs. Our specialists have many years of experience in Micro Laser Processing and Laser Technology, and through the company's maxim of 'Laser Excellence', actively gather and increase the in-depth knowledge and experience to help develop the capability of modern laser processing machinery.

Like most companies, we are aware that we need to follow the market trends closely. Laser technology is predicted to become increasingly important in the packaging industry, integrating the higher level of efficiency of fiber lasers, as well as providing integration systems for online quality control. By building a reputation as an innovator in the flexible web converting and food packaging industry, and manufacturer of tailor-made laser processing systems, we have been able to supply customized solutions to prominent flexible packaging producers throughout the world.



# The rise and rise of China's consumer



**Asia editor, Kevin Liu, examines the current state of the package printing market in China. With demand for consumer products increasing, the capacity to satisfy that demand will grow rapidly**

In recent years, China has witnessed rapid development of its package printing industry, resulting in accomplishments that have astonished the world. According to the China Packaging Federation statistics, the total value output of the Chinese packaging industry has now exceeded 1.2 trillion RMB, making it the second largest in the global market.

Concurrent with the boom in the Chinese economy, the country's package printing industry grew more than 10

percent. According to figures from the Printing and Printing Equipment Industries Association of China, the total output of the Chinese package printing industry was 1,715 billion RMB in 2009, compared with the 1,550 billion RMB in 2008, an increase of 10.6 percent. Package printing now accounts for 33.8 percent of total Chinese printing industry output.

From the statistics of General Administration of Press and Publication of the People's Republic of China, there



are 101,948 printing enterprises in China, of which 43,384 are packaging enterprises, making up 43 percent of the total. Significantly, the package printing industry is now growing at a rate far higher than the rest of the printing industry, largely because China's steamroller economy, and its large processing and manufacturing industries, are providing enormous opportunities for growth.

If you look at the light industrial sector – which includes electronic products, food, wine, beverage, pharmaceutical, and small household electrical goods – the quality of these products has improved consistently in recent years, requiring more and more attractive and colorful packaging.

#### Quality demand

Take the food and pharmaceutical industries, for example. The quality demands of the food industry offer a vast opportunity for the Chinese package

printing industry. In 2009, the gross output value of the food industry was four and a half trillion RMB, and the needs of the food package market reached 70 billion RMB. The gross output value of the Chinese pharmaceutical industry is now almost 600 billion RMB. There are 3,200 pharmaceutical manufacturing enterprises, 13,000 pharmaceutical wholesale enterprises, and 22,000 retail enterprises in China. These account for half of global production. The Chinese medicine market is growing by more than 10 percent annually and will provide large opportunities for the package printing industry.

In terms of package printing materials, paper based packaging still dominates, with China manufacturing and consuming 92 million tonnes of paper and board a year. Plastic packaging occupies second place. According to the statistics of the China Packaging Federation, the average growth rate of plastic package output was 13 percent between 2006 to 2010, with production volume reaching 16,302 million tonnes. Film packaging accounts for almost 47 percent of total plastics packaging.

In paper packaging, sheet fed offset is the mainstream printing technology. However, in recent years, flexo printing has grown fast in the production of paper boxes and corrugated containers. Die-cutting, foiling, and assembly inline is becoming more widely used in folding carton production, and flexo has become the fastest growing technology in the multi-color carton market. The development of new plates, water-based and UV inks, and anilox rollers, has improved print quality, and flexo printing is predicted to grow rapidly in the printed packaging industry.

As China's national economy grows, so will the demand for labels and packaging in the food, chemicals, pharmaceuticals, cleaning products, cosmetics, household electronics and logistic industries.

The annual growth rate in the label industry is 15- 20 percent, and it is the fastest-growing package print segment. At present, there are more than 5,000 label printers in China, and last year, in 2010, the overall output of the Chinese label market reached 16 billion RMB, or 2.1 billion square meters of volume output, and increase of almost 20 percent over the previous year.

Letterpress is still the main label printing technology in China but recently, investment in printing equipment has focused on narrow web flexo machines, and popularity of more color units and combination printing is increasing. Digital

technology has become the 'hot spot'. Production of digital printing equipment is increasing year by year, but digital technology is still not widely used by Chinese printing companies.

The growing packaging market has brought more companies into the market. From the list of China's top 100 printers in 2009, compiled by CAPT (China Academy of Printing Technology), 49 are package printing enterprises, and among these, five are flexible package companies, and 11 produce folding cartons. At the same time, with the growing number of e-books, Internet and other new media in use, the traditional book-printing segment is suffering, and this throws a sharper focus on package printing.

#### New investment

Some of the major package printers are moving into labels, like Shanghai Zijiang Holdings. This is one of the largest packaging enterprises in China, and the premier supplier of KFC cartons, with a specialized production workshop and assembly line. Zijiang also produces corrugated boxes. In 2004, Zijiang invested 45 million dollars in setting up Shanghai Ziquan Label, which specializes in various PVC, OPP, PET and other materials of both plastic and paper based self adhesive labels, and the company is now one of the most competitive label converters.

Another company, Hong Kong Starlight Holdings, established sub-companies in Suzhou and Shenzhen in China, specializing in folding cartons, corrugated boxes and high quality labels. Half of its products are exported, particularly those for electronic products, toys and upmarket cosmetics. A new factory, focusing on the production of self-adhesive labels with two Nilpeter presses, was founded by Starlight in 2011.

By contrast, some enterprises that started out in labels have entered the package printing market by merger or investment – such as Suzhou Jiangtia. The main business of Jiangtia is chemical labels and electronic labels, but in 2009, the company entered the package market through a color box printing company and subsequently formed a package print workshop.

Like most markets in China, that of package printing is on the move – and that movement is rapid. With the demand for consumer products increasing, the capacity to satisfy that demand will increase too and since most products are packaged, the knock-on effect is obvious.



Labelexpo will host its first package printing feature

# Package Printing Zone at Labelexpo

Labelexpo 2011 is the world's leading showcase for narrow and mid web press technology. Now it is expanding into package printing applications, as Mike Fairley reports

The printing of flexible packaging, cartons and tubes using narrow-web conventional and digital presses will be the focus of a new package printing zone at Labelexpo 2011. Demonstrations, seminar sessions, a 'What's new in Package Printing' booklet and a package printing trends review publication will all be part of this new visitor attraction. Mike Fairley looks at the evolution of the fast evolving sector

Package printing is one of the most dynamic of all the printing sectors. Flexible packaging and carton production alone in Europe are estimated to be in excess of a 20 billion euro market. Driven by consumer demand, changing legislation, higher quality and performance requirements, environment and sustainability, the rise of 'Own Label' products, and pressures on prices and costs, package printing is constantly under review.

One of the challenges faced by brand

owners and global retail groups is how to launch more and more products, have more variations and versions, increase their ability to personalize packs, react with consumers, and yet print shorter runs economically. A key solution to many of these challenges is to move to narrower web presses or, like the self-adhesive label industry, begin to install increasing numbers of digital printing presses.

Analyze the label printing industry today and it is estimated that as much as 15 percent of self-adhesive label converter output is taken up in producing shorter runs of sachets, pouches, small cartons, packets, tube laminates, flexible packaging and the like, where press widths of between 250mm and 440mm are most common and web widths of up to 500mm, 650mm or more are being introduced.

Whether printed on conventional quick-changeover narrow web-fed analogue flexo, offset or combination process

presses, or on new generations of digital roll- or sheet-fed presses using dry toner, liquid toner or UV inkjet, package printing is undergoing significant changes in everything from origination to pre-press, proofing, workflow, printing and finishing.

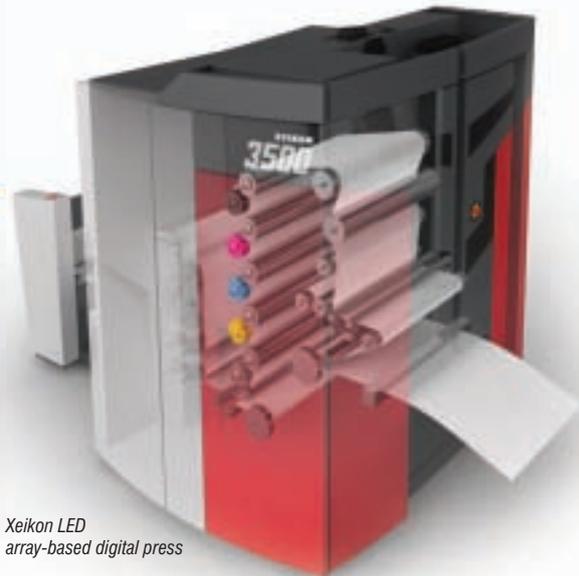
## Flexible packaging

Like many other sectors, flexible packaging is vulnerable to the changing requirements for reduced run lengths, differentiation in SKU proliferation, test marketing for new product launches, minimizing stockholding and inventory reduction, faster delivery and expanded promotional opportunities. These changes begin to favor printing on narrower webs and the use of digital printing technologies.

In a forthcoming presentation as part of the Package Printing zone at Labelexpo, Randy Parish, director, Fasson Rapid-Roll, will review the key flexible packaging market opportunities



EFI 4830 UV inkjet



Xeikon LED array-based digital press

for narrow-web converters as being in the food, personal care, pet food and nutraceutical sectors, where unsupported films are typically surface printed and then protected with varnish or an over-laminate.

Examples given of food products suitable for narrow-web printing are indicated to include single serve snacks, powdered goods (soup mixes, gravy, spices), coffee and regional foods, while in personal care the opportunities are seen in items such as shampoos, conditioner, lotions, travel kits, and promotional items.

Pet food possibilities include single serve pouches, treats and promotional items. Narrow-web nutraceutical applications are in products such as bars, supplements, protein powders, snacks, and drink mixes.

Similarly, in a recent study into which flexible packaging market segments would be easiest to penetrate with digital, ExxonMobil Chemical saw narrow/mid-web digital printing of flexible packaging as particularly able to create added-value solutions in the ice-cream novelty market, followed by opportunities in confectionary packaging.

In the ice-cream novelty market, Marcin Lapaj, market development manager, ExxonMobil Chemical, will tell Package Printing zone visitors about the need for short runs to eliminate stock-outs, notoriously difficult to forecast because ice-cream demand is highly sensitive to both the weather and days of the week. Add to this the fact that frozen goods

are expensive to store and transport and it can be seen why narrow-web, conventional and digital, printing starts to come into its own.

ExxonMobil Chemical says the same sector also sees novelty packs as impulse-buying items that are able to capture lost sales due to stock-outs, and narrow-web digital printing of single pack novelties offering a significant opportunity to enhance profitability.

Key challenges to be put forward by ExxonMobil Chemical at the show are for narrow-web converters to create designs that can be printed in more vivid colors; to simulate the printed result at the time of the design creation; to maintain high color fidelity; and to increase speed of approval and launch of new products and promotions.

Suggested opportunities for converters looking to grow their digitally-printed narrow-web flexible packaging capabilities are said to include fast product promotion at major events, such as music festivals, or the development of on-shelf packs that track progress of the World Cup, Olympic Games, etc, major drama series or new films, as well as the development of limited edition packs.

Undoubtedly, it will be single-web markets where narrow-web printing gains most initial advantage. It is less complex than multi-layer films, while further improvements in press technology, process control tools, and

packaging materials, will be required to fully capture narrow-web opportunities in the flexible packaging world.

Talking of narrow-web conventional and digital presses for flexible packaging, where does the market stand today? Most of the leading narrow-web label press manufacturers now have models developed specifically for flexible packaging.

#### Conventional and digital presses

Nilpeter, for example, launched a new 570mm (22 inch) wide flexo press, the FA-6, for printing unsupported films as thin as 12-micron and this is claimed to complete an 8-color job in four and a half minutes, including a change of ink pans. This press has attracted particular interest from converters looking to enter the flexible packaging market. MPS, a Dutch press manufacturer, has showcased its EXL-packaging press with Crisp Dot technology for the flexible packaging arena, as well as new EC and EF models with standard short web paths and print sleeves for label and film conversion.

Likewise, the three main leaders in narrow-web digital label presses have introduced digital press versions for the flexible packaging. HP Indigo, with over 1,100 presses sold into the label industry, now offers its WS6000 press for printing shrink sleeves and flexible packaging films down to 0.47 mil. The press comes complete with an inline drying system that reduces flexible packaging curing times.

Xeikon, a manufacturer of dry toner-



High-end Nilpeter Caslon combination press solution

based digital narrow-web presses, has recently added a 20 inch wide model (the 3500) to complement its 13 inch model 330. Both are LED-array-based digital presses that print at 1,200 dpi image resolution on a wide variety of substrates, including films such as BOPP, PVC and PET.

Another digital narrow-web press manufacturer, EFI Jettron, has also introduced its latest 4830LED UV inkjet system, and a newly developed flexible ink set that allows printing on unsupported and heat-sensitive materials, including shrink sleeve. This has opened up new opportunities for label and other converters to move into the flexible packaging market. The company also offers a single-pass digital white, targeted at printing on clear film and metallic substrates.

### Carton solutions

Similar innovative developments have been taking place in narrow-web carton production technology. Carton manufacturers looking to produce fast turnaround, high quality and streamlined multi-SKU production on-demand, and in short runs, have the option to print digitally using the latest HP Indigo WS6000 press technology. Complemented with an AB Graphic Digicon carton converting system, it enables carton producers to manage their brand customers better. At the same time,

brand owners using digital label printing for their packaging work gain the ability to launch new products affordably, and gain better visibility on the shelves.

Offering a web width up to 516mm, the Xeikon 3500 is another digital press that closes the gap with traditional printing presses, making it viable to digitally print cartons beyond 4,000 linear meters. Demonstrations of carton, tube, and pail decoration, will be given by Xeikon as part of the Package Printing zone at Labelexpo, while Agfa:dotrix and Xerox are also tackling the short-run carton market, and will be speaking as part of the zone seminar presentations.

Conventional narrow-web press manufacturers with carton capabilities, which will be presented during the PPW seminar sessions, include Omet and Gallus.

Put together, narrow- and mid-web presses, both conventional and digital, now offer carton and flexible packaging converters the opportunity to target new short-run package printing applications, drive differentiation and personalization, offer quicker delivery and reduced stockholding, and become more profitable.

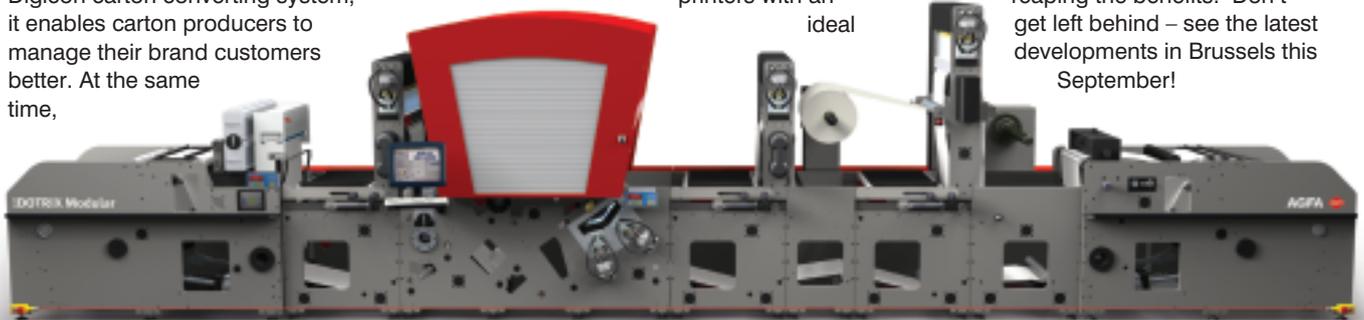
The Package Printing zone at Labelexpo this year will undoubtedly provide carton and flexible packaging printers with an ideal



*This guide to what's new in package printing will be available at Labelexpo Europe*

opportunity to see and hear the latest innovations in narrow-web conventional and digital presses for printing on unsupported films, and a wide range of board or tube laminate materials.

The driving forces behind the move to narrow-web conventional and digital package printing seems set to continue, even grow, with those bold enough to make the investment in new presses, solutions and applications reaping the benefits. Don't get left behind – see the latest developments in Brussels this September!



*Agfa :Dotrix modular UV inkjet packaging press*

## Package Print Zone Conference Program

Discover how narrow and mid web conventional and digital presses can be used for short- and niche-run packaging applications, including flexible packaging, folding cartons, pouches, sachets, tubes, wrappers and blister packs.

As brand owners look for more versions and variations,

shorter lead times, personalization opportunities, print runs are getting shorter and it is becoming even more cost-effective to use machinery traditionally used for label printing. Whether you are a label or packaging printer there are plenty of opportunities to explore in this major new feature in hall 12.

### Wednesday 28 September 2011

#### 10.00 Exhibition opens

#### 10.30 Live demonstration: heat transfer printing – providing a solution to today's trends

*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*

#### 11.00 Medium web folding carton applications

*Jan De Vooght, Head of Sales and Marketing, Industrial Single Pass UV Inkjet, Agfa Graphics*  
*Ali Fleifel, Owner, Snoppies*

#### 11.30 Advantages of a completely integrated workflow for packaging and label printing

*Sabine Roob, Senior Product Manager, Prinect Workflow, Heidelberg*

#### 12.00 In-line printing, converting and lamination of flexible packaging

*Marco Calcagni, Sales Director, Omet*  
*Paolo Grasso, Sales Area Manager, Omet*

**Wednesday 28 September 2011 (continued)**

- 12.30 Break**
- 13.30 Live demonstration: wet-glue and self adhesive labels in the wine and beverage market**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 14.00 Safe printed food packaging – how safe am I?**  
*Jonathan Sexton, Sales and Marketing Director, Narrow Web Europe, Sun Chemical*
- 14.30 Exploring opportunities to create value with 3D technologies**  
*Jan De Roeck, Director, Solutions Management, EskoArtwork*
- 15.00 Live demonstration: the potential for digital in the folding carton market**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 15.30 End of seminar sessions**

**Thursday 29 September 2011**

- 10.00 Exhibition opens**
- 10.30 Live demonstration: the potential for digital in the folding carton market**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 11.00 Mass production to mass customization – digital printing taking center stage**  
*Mike Ferrari, President, Ferrari Innovation Solutions LLC and Former P&G Executive*
- 11.30 On-demand production of digitally printed cartons**  
*Roger Chitty, Graphic Arts Manager, Xerox  
Luc Meeùs, Managing Director, Goldprint*
- 12.00 Web offset with EB-curing for package printing**  
*Bernd Schopferer, Product and Marketing Manager, Muller Martini*
- 12.30 Break**
- 13.30 Live demonstration: heat transfer printing - providing a solution to today's trends**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 14.00 Flexible packaging as a key opportunity**  
*Randy Parrish, Director Rapid-Roll Products, Label and Packaging Materials, Avery Dennison*
- 14.30 Heidelberg's digital printing solutions for the packaging industry**  
*Daniel Dreyer, Head of Linoprint, Heidelberg*
- 15.00 Live demonstration: from label and package to promotion – POP/POS**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 15.30 Barrier packaging films in the narrow web world**  
*Marcin Lapaj, Market Development Manager, North and Central Europe Films Division, ExxonMobil Chemical*
- 16.00 End of seminar sessions**

**Friday 30 September 2011**

- 10.00 Exhibition opens**
- 10.30 Live demonstration: from label and package to promotion – POP/POS**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 11.00 New business opportunities in folding carton printing**  
*Paul Mattle, Market Region Manager, Western Europe and Asia Pacific, Gallus*
- 11.30 Lean ink management: the essential ingredient for high performance printers and converters**  
*Maarten Hummelen, Marketing Director, GSE Dispensing*
- 12.00 Efficiency analysis of printing processes**  
*Josep Soler, Corporate Sales, Comexi Group*
- 12.30 Break**
- 13.30 Live demonstration: wet-glue and self adhesive labels in the wine and beverage market**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 14.00 UV flexo for food packaging**  
*Federico d'Annunzio, Managing Director, Nuova GIDUE*
- 14.30 Developments in UV inks for food labels and packaging**  
*Niklas Olsson, Global Brand Manager, Flint Group Narrow Web*
- 15.00 Live demonstration: heat transfer printing - providing a solution to today's trends**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 15.30 End of seminar sessions**

**Saturday 1 October 2011**

- 10.00 Exhibition opens**
- 11.00 Live demonstration: the potential for digital in the folding carton market**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 13.30 Live demonstration: heat transfer printing - providing a solution to today's trends**  
*Frank Jacobs, Product Manager, Marketing and Sales, Xeikon*
- 14.00 End of seminar sessions**



# This advanced, cutting-edge press expands your business!

**Jesper Jørgensen**  
Global Sales Manager, Nilpeter A/S



### Your Flexo Line for Business Innovation

Multiple Process Press • Easy-Load Sleeve Technology • Instant Setup Register  
Dynamic Print Adjustment • Integrated Direct Drive • Gearless Tooling  
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# Digital impacts carton finishing



**Digital printing of cartons is giving brand owners new marketing opportunities and is matched by a new generation of finishing machines, writes John Harrison, Director, KAMA, UK and Ireland**

Printers and brand owners alike are becoming increasingly familiar with the exciting opportunities offered by the latest digital print technology, especially in the growing market for printed packaging. The advantages are clear: the ability to print the precise quantities the customer needs, and precisely when they need it; the ability to run multi-language programs cost effectively; and the ability to respond instantaneously to a given marketplace and support regionally targeted campaigns. In addition, digitally printed packaging satisfies the 'green' environmental strategies of both printers and brand owners, and amongst other advantages, offers sustainability through reduced materials wastage.

So, it's no surprise to see the interest in digital printing of packaging products. With the folding carton market showing year on year growth, but with product packaging becoming increasingly fragmented, we are left in a world of decreasing run lengths. In recent years, technology improvements in pre-press and offset presses has enabled printers to satisfy these reducing run lengths, but increasingly, brand owners are demanding customized print to engage their customers with more relevant or unique content. It is this trend towards customization, personalization, and shorter runs that is driving the need for digital packaging.

With the trend towards digital printed cartons established, the issue is how to convert the printed sheet into a die cut blank. Generally, the digital format is smaller, so commercial printers and carton printers in particular, find their size 6 and 3B die cutters unsuited to the smaller format and very short runs, and many reverted to using 'old style' cylinder die cutters. But, with printers running state-of-the-art CtP and the latest digital printing presses, the thought of relying on 50-year old die cutting technology to finish the printed sheet has been far from appealing, both in commercial and image terms, and so a better solution had to be found.

As a manufacturer of finishing machines for the graphics industry we saw this as a

great opportunity, and embraced the market trend wholeheartedly. We had in fact, early on, recognized the likely future demand for a smaller format multi-application die cutter, and at drupa 2008 we gave a world debut to the KAMA ProCut 53. Exhibited and running for the first time at a trade show, the new machine was the world's first automatic flat bed die cutter, with a sheet format of 530 x 400mm. This new addition to our range meant we had die cutters available from B3 up to our existing B2 and B1 size machines. The suitability of our ProCut 53 for finishing digital printed soon attracted the attention of the leading digital press manufacturers, and we have subsequently formed close working relationships with Xerox and Hewlett Packard, as solution partners.

With our manufacturing plant in Dresden, Germany, our core products have always been automatic ProCut die cutters. As well as cutting and creasing, the range offers a variety of applications including hot foil stamping, registered hologram and hot cutting/creasing of plastics. Our technology has enabled printers, bookbinders, finishing companies and now carton printers to extend their services and offer greater added value finishing to their customers and greater impact for the customer's products.

KAMA's principle of the moving upper table and gripper bar system ensures precise cut to print register, and its unique sheet transport system allows it to run sheets almost nick free – something that is not possible on a cylinder die cutter. Cutting and creasing on the ProCut flat bed die cutter brings with it improved crease quality, which in turn means accurate folding and improved downstream productivity when the job has to be folded and glued.

All our expertise and know-how stood us in good stead to cope with the special demands of the nascent market

for digitally printed cartons. With digital print runs being so short, we had to focus much of our attention on reducing job change over times, and we have achieved this in a number of ways. First, the press section is exceedingly strong, which reduces the need for time-consuming patch up, and, of course, the smaller format helps too. This means it is possible to change-over die cutting jobs in less than five minutes, and change from hot foiling to die cutting in less than 10 minutes. With each Open House or exhibition we have attended, we have seen increasing interest in our B3 size die cutter, resulting in a significant number of agreed sales. What is particularly encouraging is the sight of many of the multinational carton manufacturers appreciating the benefit of digital print and actually investing in it.

With formats offered by the major digital press manufacturers getting larger, we are well placed to offer a proven die cutting solution, but in a market that is fiercely competitive, and where added value is taken for granted, our ability to offer hot foil stamping, hologram application, and hot cutting/creasing for plastics is an appropriate response to this new market trend. Now state-of-the-art digital package printing has its own bespoke finishing technology.



*KAMA ProCut 53 – small format cutting and creasing machine for digitally printed cartons*



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Since drupa 2008 most F&K presses have included smartGPS as standard specification – it can also be retrofitted to older presses.

# smartGPS revolutionizes flexo press setting



**Jörg Linnenbrügger at Fischer & Krecke, evaluates the technology and explains how it works on a modern CI flexo press. smartGPS is an RFID communication system between plate moulder and press that has dramatically improved press setting time**

**T**his technology sets a new and unique standard when it comes to registration and impression setting. What is commonly understood by impression setting does not accurately describe this new breakthrough, because the setup parameters are not realized in the printing press. Both the traditional manual adjustment, and automatic optical-based systems perform the setup process in the press whilst the machine is running. The graphic positioning system does the job off-line at the plate mounting stage, with little additional time required, and delivers the necessary set up parameters whilst the machine is idle.

The process of achieving these settings is influenced by the cylinder or sleeve and the surface variations of the mounted plate, and, until recently, had to be judged optically by the operator to achieve the optimum impression settings in conjunction with the anilox setting.

Of course the sleeve accuracy and hardness value, the tape qualities, and plate, all have an effect on the final settings, as does the anilox condition and anilox contact to the printing plate that optimizes the ink transfer.

Traditionally, all these settings are made whilst the machine is running, this takes time and energy, and generates a significant amount of waste each year.

This waste is substantially increased on modern high-speed machines, which use faster drying inks that need quicker set up speeds in order to avoid drying-in problems.

The industry has tried to automate this process by duplicating and enhancing the original manual steps with various forms of mainly optical automated technology. However, as mentioned previously, this occurs whilst the press is running with the inevitable consequence of waste generation.

In the meantime, it has been found in practice that smartGPS is also an excellent quality control mechanism, as all new sleeves or intermediate bridging sleeves/mandrels, as well as the anilox, can be precisely measured for diameter, length (end to end), and TIR (concentricity) on the same plate mounting machine. This ensures optimum values can be included in the press settings to accommodate these tolerances. The repeat length required is not necessarily that which the final

print plate package delivers, owing to diameter variations across the face width of the mounted package.

## Alternative solution

At Fischer & Krecke, we took a different approach. We decided to investigate how we could generate the print register settings and impression settings off the press in such a way that the final optimum results can be entered and set in the print decks, without actually running the machine at all.

The initial studies by F&K were conducted in different package printing industries, using different inks, different plates, different plate thicknesses, different sleeves, different shore harnesses for plates and sleeves, and different double-sided tapes, all available at different worldwide facilities. From these extensive studies came advance impression-setting findings to provide choice of the optimum impression setting for millions of variables. These algorithms were beta tested many times to determine that their accuracy would provide the required results under all circumstances.

## "In the actual printing machine, each graphic positioning print deck includes an RFID antenna and positioning sensors"

### Technical description

In the graphic positioning process, a new measuring system is integrated into a specially engineered mounting machine that enables the topography of the print ready cylinders (i.e. intermediate mandrel + sleeve + tape + plate) to be scanned to an extremely high precision level. An RFID antenna transmits the calculated data to a chip embedded into the sleeve. Similarly a data registration position is read from a second implant. This registration information is coming directly from the plate graphics. Impression data from complex software takes into account all information relating to each module of the built up package, from sleeve type and hardness, tape type, and plate type. This measuring sequence takes place very quickly.

The special mounter is also used for measuring the anilox and its TIR, providing an occasional quality control check that takes the anilox wear into account. The results of the anilox scan are similarly downloaded to a chip in the end ring of the anilox.

In the actual printing machine, each graphic positioning print deck includes an RFID antenna and positioning sensors. Once the mounted sleeves are installed in the machine, the reading of the stored data from the sleeve chips is transferred to the machine computer controls so that all the processes, from racking in, registration, and impression setting, are now automated and synchronized simultaneously for all print units engaged in the job. All this takes place whilst the machine is completely still.

### Cost Savings

Such precision pre-setting, results in a substantial elimination of waste:

- **Substrate needed during set up for register and impression**
- **Ink/solvents consumed during set up**
- **Energy used during set up**
- **Hourly press rates**

- **Substantial reduction in wasted labor time**
- **Reduction in waste disposal costs**
- **No register marks** are required therefore additional material width is eliminated
- **No damage to plates** due to over impression (i.e. longer printing plate life)
- **No premature evaporation** in impression setting (good ink transfer)
- **Consistency of the process**

The register and impression setting is consistent, irrespective of ambient conditions, and works independently of the color or type of ink or coating, including those coatings that are optically difficult to see. The system works on any substrate, including metalized films, papers and foils, and any substrate thickness or type such as corrugated

linerboard. For example, a recent installation of an 8-color linerboard pre-print press, 2.85 meters wide, uses the smartGPS system to great effect.

All print data remains in the chip with the sleeve, until new plates are mounted.

The system provides the correct impression settings independent of ink drying characteristics and machine speed.

With this new F&K smartGPS system, the print adjustments and impression parameters are known in advance of loading the job onto the press, and as such, the machine can be accelerated to production speed after the first kiss contact. Any problems with the mounted packaging, such as high spots or plate damage, will be highlighted by the mounter software and pinpointed on a quality control print out.

Essentially, the system does not replace the skills of the operator but enables them to increase the uptime of the press with minimum waste, resulting in a greener and more profitable operation.

Almost all Fischer & Krecke machines sold since drupa 2008 have included the smartGPS system by choice, and the technology can also be retrofitted to earlier F&K Flexpress machines.



A new measuring system integrated into the mounting machine scans the mandrel, plate, tape and plate with high precision. This data is then transmitted to an RFID chip in the sleeve.

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# The wider market for narrow web printed packaging



**Group editor, Andy Thomas, looks at the challenges facing narrow web converters looking to move into flexible packaging and carton applications. This is a major opportunity for shorter run production as marketers look for new solutions**

**F**or many years, narrow and mid-web press manufacturers have either manufactured dedicated presses for packaging applications, or adapted their label machines to be able to handle these radically different substrates.

Comco, now a part of Mark Andy, developed its whole business model on building mid-web presses for carton and flexible packaging applications, while Arpeco and Aquaflex led the way in manufacturing dedicated carton press lines with, respectively, the Impressionist and Cartonmaster machines.

## Folding cartons

In theory, inline carton production is an attractive proposition, with its ability to add decoration such as foiling, embossing and varnishing in one pass, instead of moving stacks of sheets between machines.

Lightweight folding carton stock – typically around 350gsm – can easily be converted on modern narrow web presses as part of a wider product mix. A good example of this is Tamar Labels, located in the South West of England, which has been producing cartons on an Edale press in its BRC/IOP accredited package printing hall. Another interesting example is Ukrainian converter Pechatny Dvor, now part of the Marzek group, which is producing ice cream cones from folding carton board on its Rotatek Perfect offset/gravure/flexo combination press. This author has also covered the installation of highly specified Omet Varyflex presses for the conversion of complex cigarette packs in China.

And this Labelexpo sees the return of dedicated carton production on narrow/mid-web packaging presses from the likes of MPS, Nilpeter, Omet and Gidue.

A separate category of inline carton press is manufactured by companies like Komori Chambon and BHS, now part of the Gallus group. These are dedicated, highly robust machines which incorporate both heavy duty full rotary and flatbed die stations. Established carton converters have invested in these machines as a complement to their sheetfed offset capacity.

## Flexible packaging

Flexible packaging presents its own challenges for narrow web converters. The materials are thinner and more sensitive to heat, requiring completely different tension control settings and heat management on the press. In the days of shaft/gear-driven presses, these proved difficult challenges to overcome, although companies like TW Parker in Liverpool, UK, successfully built businesses around narrow web offset production of sachets.

The vast majority of flexible packaging work is produced on Common Impression (CI) presses, because holding the film on the impression drum while printing makes it easier to maintain registration on even the thinnest films. Ink systems are overwhelmingly solvent or water-based, and fully compliant with food migration regulations.

The real breakthrough for narrow web converters came with the widespread introduction of servo motors, making it possible to compensate for film elongation. By reading registration marks on

the film, each station can slow down or speed up to ensure register is maintained. Programmable servo tension control systems, where settings can be recalled for repeat jobs, are another important enabling factor.

To manage heat on the press, 'cool' running UV curing systems were developed by companies like IST and GEW, using a mix of chilled water circulation through the impression roll and heat dissipating technologies inside the lamp head. These technologies continue to develop to new levels of sophistication, including closed loop water cooled UV lamps.

The issue of migration of UV inks is a subject in itself – and

## Materials guide

One of the major challenges facing narrow web converters moving into flexible packaging is the range of substrates that have to be dealt with. Take shrink sleeves as an example – what are the main options that need to be considered?

**1 PVC** – This is used for applications requiring up to 55 percent shrink – used for safety seals, promotional packs or multi-packs, and for simple-shaped containers. It can also be used on more complex container shapes where up to 66 percent shrink is required. Heat and steam tunnels are equally good for this type of material.

**2 PET** – Good where shrink of up to 75 percent is required, PET has a thickness of between 30-70-microns. It will shrink at a low temperature, and can use steam or heat tunnels. It has good printability and is recyclable.

**3 OPS** – With a thickness of between 50-60-microns, and low density of 1.02 g/cm<sup>3</sup> (compared with PVC and PET at 1.31 g/cm<sup>3</sup>), this is for applications requiring maximum gloss, moderate rigidity and where good finishing properties are required in terms of web tension and shrink speed. There are special storage requirements owing to the high 'memory' level of the material.

**4 PLA – (Polylactic Acid)** – An environmentally friendly shrinkable material, which is biodegradable, non-toxic, and has good shrink and printing characteristics.

'Hot air is normally used for shrink-wrapping sleeves on empty containers, and steam tunnels for filled containers. Nonetheless, with many applications it is normal to use both application methods to optimize the shrink-wrapping process' explained Luis Rusiñol, converter at Universal Sleeve in Spain. Shrink sleeves are required to be delivered either as cut&stack, or on the reel for automated application systems.

is covered in more detail elsewhere in this magazine – but migration is not an issue if the films are laminated. We have therefore seen the launch, by companies like ABG, of dedicated film lamination systems for narrow web film converters, while companies that traditionally served wider web markets – Comexi for example – have developed lamination machines ideal for mid-web press widths. Gidue has also announced that it will launch its own inline laminator at Labelexpo Europe in Brussels this September.

Along with these systems, specialist film inspection rewinders have been developed by all the leading narrow web finishing machine manufacturers to handle the tension and width requirements of packaging films.

With a skilled press crew, typical flexible packaging materials gauges of 18-microns can be handled on these machines. Indeed, the Marzek operation in Ukraine is printing films down to 12-microns – way below what the press manufacturer said was possible. Italian converter ACM, a specialist in narrow web UV flexo flexible packaging converting, also prints regularly down to 12 microns on its 7-color 530mm wide OMET VaryFlex F1.

US converter, Ross Print, converts pouches, sleeves and shrink film in runs down to 10,000 pieces, and in anything up to one million. Machinery used in this market includes a servo driven Mark Andy 2200 press with a 17 inch web width servo, and a high speed slitter rewinder from CEI, along with BST Shark inspection system.

#### Market opportunities

There is clearly a major opportunity for shorter run production of flexible

packaging substrates, as marketers look for opportunities to target specific demographics or events. These trends are also persuading wider web flexible packaging converters to investigate narrow web technology as an answer to these shorter run requirements.

Some retail groups are now looking to eliminate labels altogether on fresh food products that have a known weight, opening up significant new opportunities. 'They want to wrap fresh produce and print the weight on the film rather than adding price-weight labels,' explains Hoessein Hadaoui at leading Dutch label converter Telrol. 'This is already being done by some major UK retailers – for example flow packs of tomatoes at Asda, where all the nutritional and weight information is printed on the film,' he adds.

Some of Telrol's biggest customers have promised to support the converter in making this transition over the next two years, and the company is considering adding a web offset capability to handle films as well as carton sleeves.

'Our label business will always exist, but in the future we want to supply our customers with the whole package, whatever the format or print process required,' says Ton Jacobs. 'We will have a lot to learn about printing on materials like gas barrier films, including issues of ink migration and how these films stretch on the press. But, with our customers' support we see great opportunities in these areas.'

Telrol's MPS UV flexo presses have been specified with chill rolls and heat management packages. 'We already use the MPS presses for film, and the quality is fantastic, especially on reverse side printing,' concludes Jacobs.

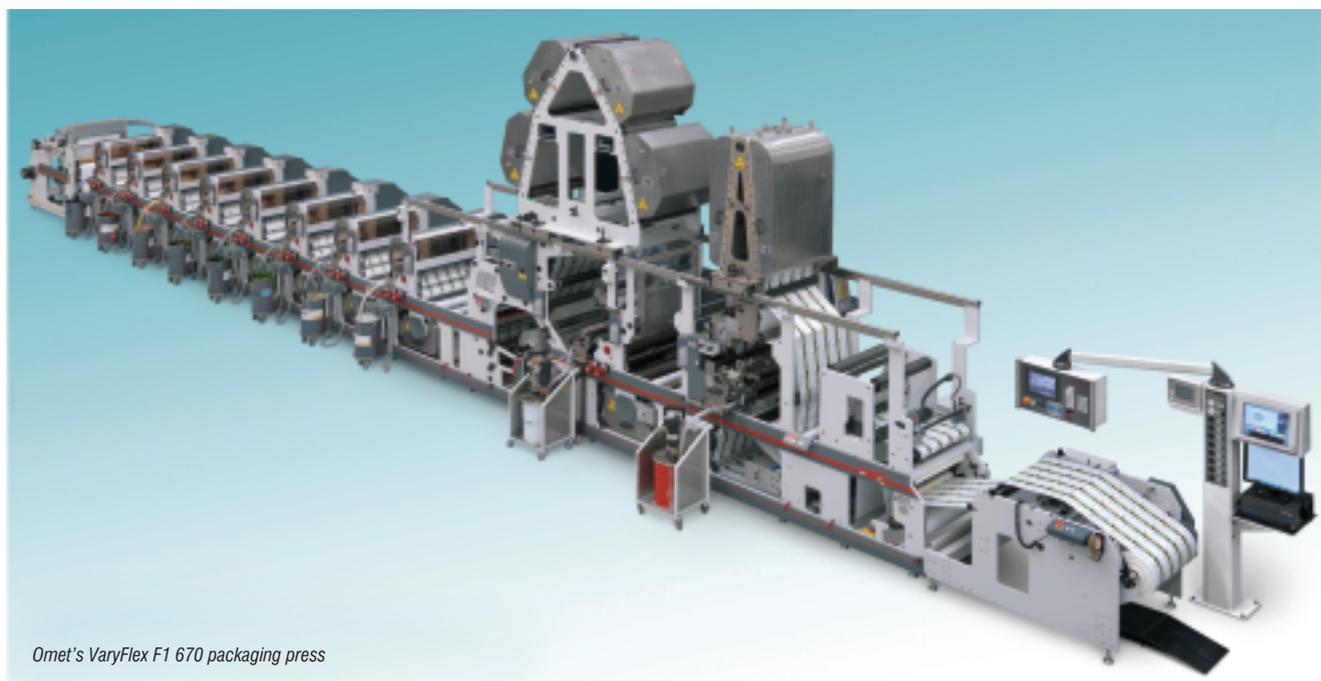
## Omet installs VaryFlex at Pragatipack in India

**Pragatipack, a family owned business based in Hyderabad, has installed an Omet VaryFlex for the inline production of flexo printed folding cartons. The new VaryFlex has the facility for installing a rotogravure, cold foil, or screen cassette in every position on the press to enhance the UV-flexo printing. It can produce a number of techniques in one pass, including: reverse printing, foiling, overprinting, metalizing, relief printing, and converting.**

Speaking on behalf of the team at Pragati, Hemant Paruchuri said: 'We're excited about the wide range of substrates that can be printed on the press, from 12-micron all the way up to 600. This will bring us into the carton side of business, with many opportunities to explore.'

Omet's long experience in designing and producing high-tech equipment attracted Pragati. The manufacturer's detailed specification in the design of the machine and its ongoing commitment to utilizing new technology, convinced Pragati that it would be a reliable partner.

The sale was handled by New Delhi based Weldon Celloplast, exclusive agents of Omet in India and surrounding countries. Pawandeep Sahni, director at Weldon commented: 'Pragati is a very professional printing company with exacting demands, so we are delighted that a printer of such caliber has approved and bought an Omet VaryFlex. They will use the Omet to build on their reputation as an award winning company, having won the Sappi Elephant award in 2006, 2008 and again in 2010.'



Omet's VaryFlex F1 670 packaging press



*Secuseal Security design feature can be built in during the design stages*

# The role of package printing in brand protection

**Package printers can play a vital role in brand protection. Mike Fairley looks at the challenges, opportunities and solutions for printers and converters to develop anti-counterfeiting solutions**

**A**nual global losses through counterfeiting have recently been estimated to be as high as 600 billion dollars – a staggering sum. This figure includes lost revenues to brand owners, lost government taxes, lost jobs at product manufacturers, and death or injury of hundreds of people each year due to products such as fake medicines, fake and faulty electrical goods, counterfeit and dangerous car components. Indeed the list of counterfeit products today is extensive.

In a recent study by the Organisation for Economic Co-operation and Development (OECD) it was estimated that pirated products worldwide cost companies over 250 billion dollars – a rise of more than 53 percent above the 2007 figure.

In recent counterfeiting and piracy studies it has been shown that the pharmaceutical, medical and cosmetics industries have posed a particularly high risk to the public – often because of ineffective filling agents instead of genuine, more expensive medical substances; and cheap ingredients instead of high-quality cosmetics agents.

Indeed, according to the World Health Organisation, counterfeit or fake medicines can have active ingredients missing or the product be adulterated with toxic substances, or with ingredients that clash with other medicines. This has significant cost implications for drug manufacturers, pharmacies, medical insurance companies, hospitals and health services.

But it's not just counterfeit and fake medicines that are at issue. Counterfeiters will target almost any products that have a value to them, and which can be sold through street markets, car boot fairs, on the internet, or in bars and clubs. Products and goods include:

sports and other clothing, footwear, perfumes, automotive parts, toys, electrical goods, games and business software, fashion accessories, and many other items.

What's interesting for the label and packaging industries is that a great many of the genuine products are extensively labeled and packaged to make them attractive to buyers in the retail environment. So, apart from the counterfeit products, the counterfeiters also have to counterfeit the labels and packaging – and even the guarantees and warranty documents for some products.

#### **Just look at some of the ways that counterfeiters and pirates work:**

- They counterfeit the entire product and the packaging and labeling
- They counterfeit packaging and labeling only, to enable reject or out-of-date products to be re-packaged and passed-off as genuine
- They re-use genuine packs/labels with counterfeit products
- They use an unauthorized look-a-like or registered brand name with a counterfeit product
- They counterfeit ownership/sale documents – including guarantees
- They even counterfeit instruments of payment, i.e. cheques, credit and debit cards

The obvious question that arises from all of this is: 'Why don't the brand owners, packaging printers and

label converters work more closely together from the very beginning to build brand protection and security features into the packs and labels at the early design stage?' Is it a lack of understanding of what can be done, or worries about cost considerations, or simply not talking at an early enough stage?

After all, packs and labels have to be designed, printed on a substrate, with inks, by different printing processes, finished in different ways, and packs closed or labels applied. Every one of those steps has the possibility of building-in security and brand protection features. So what can the label and packaging industries – and brand owners – do to authenticate products better, reduce counterfeiting, enhance brand security and minimize theft or product tampering?

Well, wherever possible, they should look to build counterfeit deterrence, product authentication and brand protection technologies into the design of the label or pack from the very beginning. They should aim to combine different (low and higher-cost) technologies to provide the most cost-effective overall solutions. If possible, they should look to make each label/pack unique. Then, once a pack or label has been developed with security/brand protection features they need to keep ahead of the counterfeiters by changing the solutions and technologies they have used on a frequent basis.

Part of the challenge for packaging printers is that few of them are aware of the wide range of security technologies and solutions available to them. Some solutions are only available under licence or restricted usage; some require special readers; some require specialized equipment to produce; and some are probably too expensive to use on consumer products. Nevertheless, there are still hundreds of possible options, either on their own or in combination.

Put together, the possibilities for label and package printing companies to offer anti-counterfeiting solutions to their customers is extremely diverse and includes security designs and backgrounds, security substrates, security inks, varnishes and coatings, security printing and converting, sequential coding and numbering, Optically Variable Devices (OVDs) – primarily holograms – optically variable inks, films and coatings, server-based authentication systems (such as Krypsos) and newer innovations such as bio-codes, DNA, RFID and other 'smart' label or 'smart' packaging solutions.

An ever-more sophisticated and ingenious range of security design features have been developed in recent years, many of which – such as :Secuseal – are finding applications in brand protection, anti-counterfeiting and security labeling. This particular feature is an Agfa Graphics dedicated design and verification tool for designers, label and package printers and producers of counterfeit-sensitive products such as pharmaceuticals, tobacco products, luxury goods, perfumes, and liquors, which generates complex security designs and patterns that will make counterfeits recognizable and traceable.

Then, there are security substrates, which have been developed to include one or more special identification feature, such as chemicals, metallic strips, taggants, security threads, colored fibers, reactive dyes or watermarks that will assist in detecting fraud and preventing counterfeiting.

Security inks, varnishes and coatings are a good medium to provide authentication and brand protection on labels and packaging because almost all packs and labels will be subjected to a printing process of some sort. Therefore, inks that will provide some kind of special security or authentication feature(s) can offer an effective solution to security problems.

Close co-operation at an early stage between brand owners, designers, printers and a specialist security ink manufacturer can be a cost-effective way of protecting packaged and labeled goods. Many of the security inks can be printed by most printing processes, although not all printing processes are



*The Krypsos server-based authentication system used to generate a 'genuine' or 'fake' verdict enables brand owners to provide fraud detection and product authentication in their supply chain*

suitable for every variation of security ink.

Many converters will also be aware of hologram (Optically Variable Devices or OVDs) solutions that have become powerful tools in the prevention of counterfeiting of packaging, labels and tags. Both overt and covert machine readable features, variable data and unique serial numbering, can also be incorporated.

Holograms offer a wide variety of different features that can be matched to different levels of security requirements, from those used in relatively low-cost applications, such as labels and packaging, up to more sophisticated security methods used to protect currency. Easily identifiable holograms are primarily used for first-level identification devices, and are designed to enable successful authentication at point of inspection.

New developments in pack security features are also coming from the digital press manufacturers who are able to offer security design features, sequential coding and numbering, new ink solutions, hidden images and much more. Further developments are in the pipeline for launch at Labelexpo and Drupa.

While not wishing to review every kind of security and brand protection technology, it can already be seen that discussion at an early stage between brand owners, designers, printers and security solution providers can frequently offer cost-effective solution – particularly if some basic guideline rules are adopted.

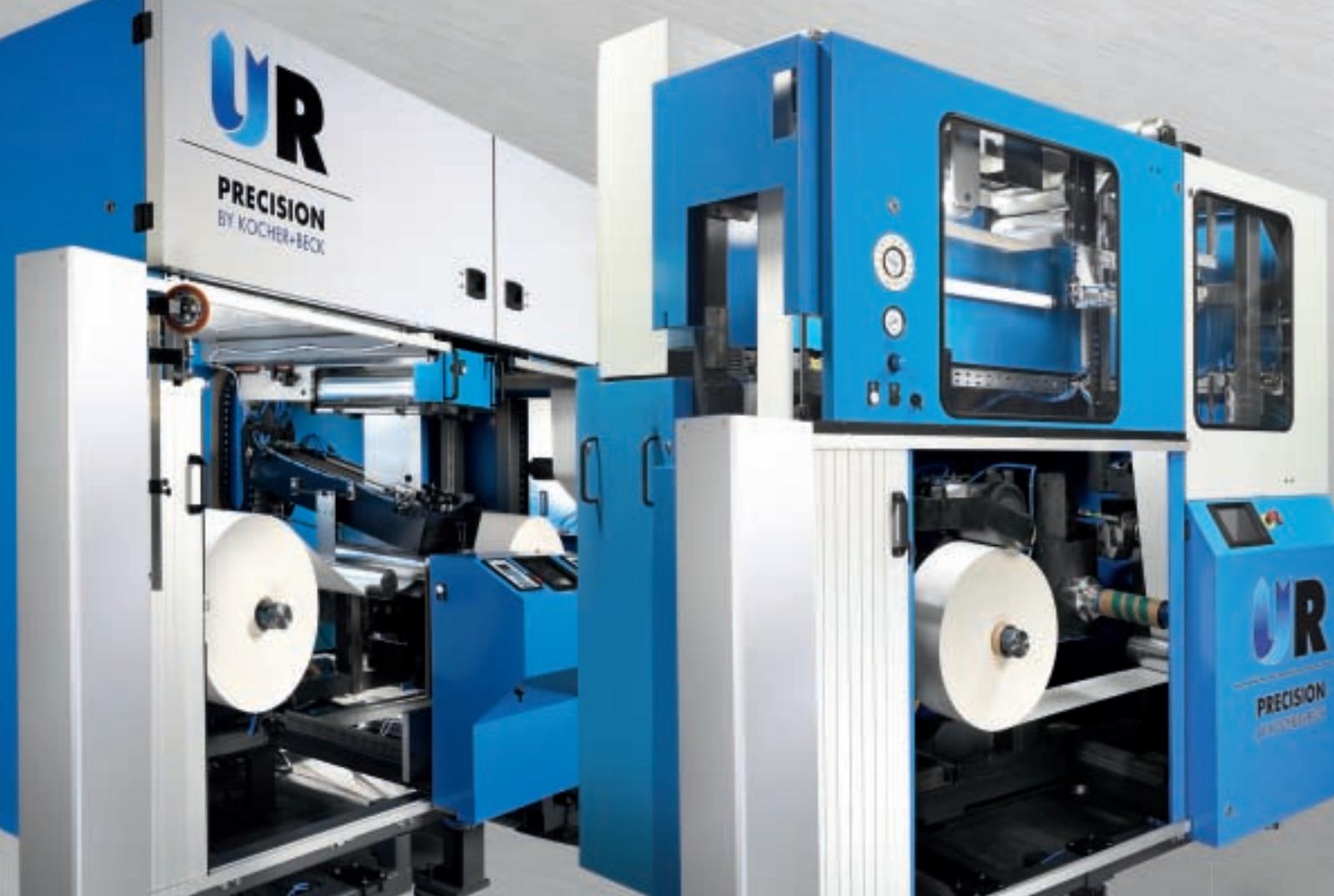
First, aim for the highest possible level of security with optimum cost. Second, look to combine low and high security elements to enhance protection, for example, by printing a sequential number over a hologram. And third, use different types of security technologies to maximize counterfeit protection.

### **In summary**

All packaging requires the use of design, ink, substrate, and various converting processes that include varnish, lamination, and holograms, to name but few. Each of these elements and stages in production offer opportunities for security features to be added.

Currently, it appears that few package printers are aware of the wide variety of security options available, and consequently are unable to suggest them to their customers as a means of enhancing brand protection.

Little wonder then, that the counterfeiter continues to thrive.



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The Agfa Datrix Modular press

## AGFA scores Dotrix success in Latin America



**Latin America editor James Quirk reports on an innovative joint venture between three companies in Brazil that resulted in the first Latin American installation of Agfa's :Dotrix modular digital press. The company says it will allow it to be profitable for short and medium run length work**

**T**he first installation in Latin America of Agfa's :Dotrix press took place in Sao Paulo, Brazil, last year. With three companies joining forces to purchase the press – using it to serve their existing businesses and tackle new sectors together – the installation provides an interesting blueprint for print companies looking to take advantage of the machine's ability to serve multiple markets.

Unigraph, a provider of pre-press services to the label and packaging industry; Gegraf, a supplier of POS materials, displays, signage and folding cartons; and Insight, a printer of banners and posters for food retailers and supermarkets, purchased the Agfa :Dotrix together, and founded a new company, SMS Impressao Digital, out of the joint venture. The companies' joint investment, which included Insight and Gegraf installing additional equipment for packaging and POP display production, totaled 10 million US dollars.

The modular press is housed in Unigraph's facility and produces a

wide variety of products – from flexible packaging and labels to displays and signage; even being put to extensive use during the 2010 Brazilian government elections – which have helped the companies increase the competitiveness of their own businesses while also allowing entry into new markets.

### Investment decision

Unigraph, Gegraf and Insight began talks in 2009. The companies' owners were firm in their belief that packaging market trends needed investment in digital printing equipment, and set themselves a series of targets before making a decision. They wanted to be the first with UV digital inkjet in their market; required high production speeds to increase capacity and allow them to produce short and medium run work profitably; and were keen to increase their flexibility to turn work around in shorter time frames, and be able to offer UV-quality print on a wider variety of substrates.

'We looked at all the different digital press technologies available,' said

Michele Lopes, owner of Insight, 'but the Agfa :Dotrix was the one that combined high speed with UV and variable data. UV is important because of the wide variety of materials it can work with – it gives us the ability to innovate. Solvent inks will disappear in a few years, for environmental reasons and performance issues, so we had to choose UV.'

'We needed more capacity at the right quality, and the ability to produce multiple orders of short jobs. In Brazil, the trend is towards shorter runs, and more of them, which is a big problem for offset,' continued Lopes. 'We knew we needed additional manufacturing capacity with speed and quality to profit and grow in the coming years. We liked the flexibility of the Dotrix: it can work with such a variety of substrates. The Dotrix will be the automatic choice for all printing on vinyl and plastics, but it will also allow us to remain profitable for short and medium run length work in general.'

The machine was installed in May 2010. Within a month, the Agfa :Dotrix was exclusively dedicated to printing



Sylvio Serra of Unigraph heads the SMS Impressao Digital project

posters and displays for the Brazilian election, running 24 hours a day until December, and supplying the two principle political parties. At the beginning of 2011, SMS Impressao Digital turned to the label and flexible packaging markets, working with leading brands such as Procter & Gamble, Carrefour and Johnson & Johnson.

'As the first installation in the region, it required a leap of faith,' explained Sylvio Serra, the managing director of Unigraph, who heads up the SMS Impressao Digital project. 'Strategically it was a risk, but it is also a great competitive advantage that we are the only company to run an Agfa :Dotrix press in Brazil.' As the first Brazilian company to install computer to plate technology 12 years ago, Unigraph is no stranger to innovative investment.

'The machine's versatility is a great advantage, but it brings challenges with regards to finding its niche and its role in the market,' Serra continued. 'The Dotrix's concept is not easily defined, so it takes time for the market to adjust.'

Serra says that the machine may yet end up specializing in one area, but for the time being, the company is taking advantage of the press' ability to face the Brazilian market's trends towards shorter print runs and increasing need for variable data, as well as the challenge of decreasing profit margins. Serra cites flexible packaging and POP displays as the markets with most potential for growth. A further advantage has come from the biodegradable inks used by the Dotrix. Brazilian company CRP Plasticos has been testing a biodegradable polypropylene film, Vitopel, at SMS, which Serra describes as 'an excellent value-added product'.

Prior to the installation, the directors of Unigraph, Geograf and Insight made multiple trips to Agfa's headquarters in Belgium for consultation. They also visited Gardners, a digital printing business located in Cardiff, UK, which runs two Dotrix presses for the production of posters, displays and packaging. 'I saw the Dotrix working all day long without stopping and the owner told me it was the most important machine he had,' commented Michele. 'At that point, I was happy!'



A close up of the Dotrix's digital print units

### High production capacity

The Dotrix modular digital UV inkjet press, with a printing width of 630 mm, is able to print with high production capacity on a wide variety of substrates including flexible foils, self-adhesive materials over 20-microns, and folding cartons up to 600-microns. With its modular construction, traditional UV flexo printing stations, which can serve as coating and varnishing alleys, can be added to the basic roll-to-roll configuration. Slitting and die-cutting, as well as sheeting, hot stamping and tooling units, can also be integrated to complete the system. Targeted at short- to medium-runs of packaging and POP jobs, the machine turns out over 1,200 square meters per hour at full speed.

Dotrix employs piezo drop-on-demand print technology across multilevel Agfa print heads. The base unit configuration includes a jumbo unwinder and rewinder, substrate pre-treatment options as well as Corona, web cleaning and anti-static specifications. The jumbo unwind and rewind system can handle rolls of up to 1,250mm (49inch) diameter, weighing up to 800kg, allowing long and uninterrupted print runs.

At SMS Impressao Digital, the Dotrix prints four colors digitally, though the machine can produce up to six. Meech equipment cleans the material prior to printing, before a Vetaphone Corona-Plus provides corona treatment and web guiding. The material then passes through a flexo unit, the digital printing section, a second flexo unit and equipment for reverse printing. Die-cutting accommodates both vertical slitting and sheet cutting and the printed result can be stacked in rolls or sheets. Further finishing takes place offline.

The Dotrix at SMS Impressao Digital runs at 24 m/min and produces 900 square meters of products per hour. The company produces 300,000 square meters a month, though the machine is capable of achieving 500,000 square meters per month. Such is the productivity of the Agfa :Dotrix, SMS initially struggled to keep up with finishing requirements, says Serra.

Unigraph employs 25 people at its facility in Sao Paulo, both for its existing pre-press services and the SMS Impressao Digital unit. The Dotrix is handled by two operators and runs one shift.

Claudio Gaeta, Dotrix sales manager of Agfa Brazil, admits that prospective clients can be overwhelmed by the machine's scope. A deal with SMS Impressao Digital, however, not only allows potential customers to see the machine in action, but also to produce an example of their own print job. It's an important strategy that lets converters from around the region test the machine and get a feel for its results, without having to invest in the technology first.

'At SMS Impressao Digital, we can see the opportunities available in the three different areas for which the Agfa :Dotrix was really built: POP and POS, folding cartons, and flexible packaging and labels,' concluded Gaeta. 'It is a unique proposal that shows the Latin American market what our digital UV print system can produce.'

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# Breaking new ground in package printing



**Marco Calcagni, director at Omet, discusses how one press manufacturer has responded to changing market demands using inline flexo and hybrid machines originally developed for label printing**

The idea of using inline flexo and hybrid machines, developed for label printing, to produce flexible packaging and light carton cases of small and medium formats is not new, but it is very much part of today's news. Some converters were using this technology back in the 1990s, particularly in the USA, where inline flexo was well established. But, it was not until Labelexpo in 2001, where Omet launched its VaryFlex line, specially configured to print and convert packaging for various sectors from foodstuff to non-food, that the European market started to take notice.

Using consolidated experience of processing extensible films, and in particular shrink and stretch labels, as well as thick cellulose substrates, it was possible to develop the optimum technology for quality printing on different flexible materials, and special units to process and convert carton board into die-cut boxes and cases, in a single step.

Throughout the decade since that launch, the VaryFlex concept has continued to evolve, with the development of new application technologies. These have made it a viable alternative to the large gravure and CI flexo presses, as well as sheet fed offset equipment. All these technologies are chasing the same market; one of superior quality packaging, characterized by reduced run lengths and shorter make ready times. Not forgetting lower costs too.

To cater for this varied market, it was elected to make the press available in a variety of web widths, from 430 mm to 850 mm (17 inch to 33 inch). By doing so, it fulfils the needs of a broad consumer market that demands printed packaging should combine information and a promotional function.

## Flexibility and quality

We believe that we are probably unique in the variety of technologies on offer. This begins with a fully modular platform that can be configured as a hybrid, with flexo, gravure, offset, screen, and digital printing, as well as inline converting units for die-cutting, hot/cold-foiling, and hologram transfer. Of the current crop of multi function machines, the VaryFlex is seen to be the only mid-web inline press that allows the interchange and variable positioning of the gravure unit, and incorporates inline lamination and cold-seal devices as options, which are useful for producing ice cream and frozen food packaging.

The machine can be equipped with different drying systems for solvent or UV inks and is provided with the new automatic register control system, known as 'Vision 2'. This has a video camera mounted on each printing unit to bring the line into register within just a few seconds, and so dramatically reduces start-up times and substrate waste.

For carton box converters, the inline converting possibilities, with interchangeable die-cutting units and two unique units, called Fly Cut and Twin Cut, enhance the flexibility of the line and increase its productivity. The Fly Cut unit allows the press to cut different sizes from six inches to 33 inches without having to make machine adjustments. Driven by an independent motor,

it uses a synchronized shear action for a clean and accurate cut. The Twin Cut system produces a die-cut format range that avoids having to replace heavy and expensive die-cut cylinders.

To enhance appearance and also offer a degree of brand security, one of the key finishing techniques now available is hologram application. It is used with paper and light carton metalization using water-based resins and embossing. An overhead path can be assembled to insert the application in any required position. The flexibility of the inline multi-technology system is enhanced by stability of gearless drive train, with its associated lack of vibration. It is this that makes the press line so suitable for producing packaging with very high quality graphics in fields that compete directly with CI flexo, sheet fed offset and gravure presses, not only on a quality level, but above all, on an economic one.

## Consolidation in strategic markets

Acquiring experience in the packaging market, with more than 10 years active involvement, has brought worldwide success to machines in the VaryFlex series – with different web widths and configurations – working at leading plastic and carton packaging houses across five continents. In our home market for example, we have Cartotecnica Palladio, a major sheet fed offset converter, which specializes in pharmaceutical packaging, while elsewhere Multicolor, Smyth, Identigraphic, and Supremex, figure strongly, and LabelMaker is currently printing flexible packaging on a brand new VaryFlex 850 in Ireland.

Among our most significant reference customers is Hubei (China), where on a multiple configuration line, cigarette cartons with a smart holographic finish are produced on a special unit in one pass. The Chinese market continues to be one of huge potential for our diffuse range of package printing lines, and for that reason we have increased the size of our factory in Shanghai, which contributes to the assembly work, installation and service of the latest generation of machines.



*Samples of the different types of work produced on an OMET*

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# Growth potential for small format presses



**Christian Knapp, managing director of KBA UK, says the global downturn has served to accelerate the trend to shorter, more frequent, print runs and a resurgence in the market for B1 carton presses**

Large format presses are undeniably the official technology in today's packaging production and POS sectors. That said, the adverse economic conditions of recent years, and consequent dampening of confidence, have served to accelerate the trend towards shorter, more frequent, print runs. This has brought the medium format B1 presses into contention.

The B1 format benefits from its cross-sector appeal, and it is here that manufacturers are most likely to achieve a return on their expensive R&D initiatives. So, for example, many of the innovations that flow from KBA's consistency in the table of patent applications are premiered on its new B1 Rapida 106 press.

Optimum performance, scheduling flexibility and cost efficiency are all vital press requirements for package printing operations seeking ways to remain profitable and competitive. That is why research has concentrated heavily on creating an array of feature-rich additions to the new press, which make it more competitive and attractive to carton printers. Developments in the latest-generation of presses has focused on cutting B1 make ready times, quicker turnaround, and continuing to improve the range of DriveTronic components that enable faster, smoother and more efficient production.



*The company has demonstrated how it is possible to run 17 different 4/4 jobs on an 8-color perfecter in one hour and produce 500 saleable sheets of each job*

## Intelligently improving productivity

At the forefront of improved productivity there is the intelligent software-based solution that supports simultaneous plate changing in less than 60 seconds, regardless of the number of printing units. To highlight the commercial benefit of this technology, we can demonstrate an 8-color press, producing a total of 17 unique four over four-color jobs, each with 500 saleable sheets, in one hour. More than just headline grabbing, this technology can deliver very real time and cost savings by enabling converters to produce an array of jobs quickly and economically.

Flying job change is another technological development that enables carton printers to boost their productivity. It allows plates to be changed on dormant units while the press continues to print its current job. The new plates are then sequenced into production at full running speed, with as few as 20 waste sheets. This results in significant production gains – especially as runs become shorter and shorter. This technology is perfect for multiple language versions. For example, on a 6-color B1 press, with the process colors for the layout and images on the first four printing units, different language texts can be printed on the fifth and sixth units.

Valuable timesavings are also made by the new CleanTronic Synchro washing system that allows the blanket and impression cylinders to be washed simultaneously. This cuts washing time by three minutes.

## Savings delivered through power reduction

Also suited to carton production are developments such as VariDry. This interchangeable and flexible drying system has lamps that can be dedicated to the units for which they are required, and then quickly and simply changed over without losing any production time. A reduction in energy consumption is actively pursued and, as such, we are looking at ways to switch off the UV

lamps between sheets. Depending on the sheet size, this could cut energy consumption by as much as 30 percent.

Substrate flexibility has always been one of the key benefits of large format presses and this is also a major feature of the B1 presses. The large format presses can run grades from 80gsm up to 1.6mm while the B1 presses offer a range from 40gsm to 1.2mm – subject to press options.

Quality assurance offers brand integrity, while reducing operating hours as well as substrate and consumable waste. There are a number of dedicated systems available such as Plate Ident that ensures the right plate is on the right unit. It reads its position and pre-registers it before the first pull, speeding up make ready and eliminating the possibility of the plate being loaded in the wrong unit. This is especially important in a sector where Pantone colors – for brands – are common.

Printers can also utilize QualiTronic, which features a camera capable of scanning each sheet at over three million pixels of resolution, and matching it for content and print quality against a master sheet, while in full production speed of 18,000 sheets per hour. QualiTronic Inspect automatically tags, 'off-spec sheets', which can subsequently be ejected automatically in die-cutting or folder gluer machines, provided they have the relevant capability and QualiTronic Professional. This technology incorporates an inline density measurement and control system that initially takes approx. 60 sheets to normalize density during make ready and then ensures accurate color control during the production run.

Downtime can be reduced and jobs per shift increased significantly thanks to DriveTronic SIS infeed. It reduces make ready time by dispensing with setting and marking, and has a tolerance range of  $\pm 7\text{mm}$  (0.27in), more than any other pull system. This reduces the risk of stoppages, and because the sheets are not pulled sideways, there are no leading-edge errors or tearing.



# Packaging grows as India grows



**Moves towards more organized retailing and escalating consumer demand are bringing changes in materials and technology to India's rapidly-growing package printing sector says, Harveer Sahni in New Delhi**

I have always been of the opinion, 'it is the package that sells!' Every manufacturer of consumer goods realizes that good quality is imperative for long term success of the product. However, it is an immediate and important need to first tempt the shopper to lift the product from the shop shelf. For this the manufacturers have to rely on the package design. The consumers get to experience the contents of the package only when they have reached the confines of their homes. It is another issue that repeat sales will happen when customers find the product contents are meeting with their satisfaction. Thus it is necessary that a good product is packaged in an attractive and effective packaging.

With the urbanized Indian consumer's style of shopping undergoing change from visiting traditional Indian shops for buying goods to patronizing organized retail vends in air-conditioned ambience, packaging is now getting the attention it deserves.

The current economic scenario and changing lifestyles in India are attracting the interest of many around the world. By the last count, the Indian population crossed the figure of over one billion people. In the last decade the addition to the population has been 181 million people, almost near to the total population of Brazil, the fifth most populous country in the world. India accounts for 17.5 percent of the world's population.

The Indian economy is certainly growing rapidly, registering an eight and a half percent growth in GDP. It is the second most favored country for foreign direct investment (FDI) attracting an investment of 25.9 billion US dollars in 2009-2010. Foreign exchange reserves have reached a figure exceeding 276 billion US dollars.

According to a report by McKinsey, the economy will grow five-fold in 20 years. India is the biggest democracy in the world with a large English speaking population of which 64.8



percent is literate, leading to a bulging middle class segment. Couple this with the fact that 64 percent of all the people in the country are in the workable age group of 15-59 years and 54 percent of the population is under the age of 25 years. Over 600 million young people will be getting education, working hard and earning more to spend more. It is obvious that retail spending in India is poised to grow exponentially.

According to the report, "Strong & Steady, 2011" Price Waterhouse Coopers (PwC), India's retailing sector currently estimated at 500 billion US dollars is expected to grow to 900 billion US dollars by 2014. According to some reports, in two years retail real estate stock in India will become double, from approx. 50 million square feet to almost 100 million square feet.

The Indian retail industry is already the fifth largest in the world and is growing at a fast pace. Rapid urbanization and

higher spending power of a young generation are factors contributing to this growth. Due to the changes taking place, the large number of working women in an otherwise traditionally conservative society is also responsible for this growth in spending.

Retailing in the country however, is still developing and it will be some time before it becomes the predominant and accepted way of selling across the nation. Most of the Indian consumers are used to the idea of visiting the traditional neighborhood stores for their needs. The shop owner is virtually the pushing salesperson for the brands that provide him better margins.

As organized retailing becomes more and more acceptable, shoppers are experiencing the difference. There is a wide variety of products lying on the shop shelves yearning for their attention. The persistent shop owner pushing particular brands is missing. At this point in time the printed package is of prime importance. Innovative packaging tempts the shopper to reach for the product.

The highly fragmented Indian packaging industry is spread evenly across the length and breadth of India. The total industry size is estimated at 19 billion US dollars against the global market of 500 million US dollars. The per capita usage of packaging in India is small at 15.00 US dollars per person as compared to a global average of 100.00 US dollars. This indicates the potential for growth in this market. According to Indian Institute of Packaging, the packaging industry in India is growing at a rate in excess of 15 percent per annum. However some industry experts express that the growth is much higher at 20-22 percent.

Food and beverage account for 85 percent of packaging materials consumed in India, Pharmaceuticals 10 percent and balance five percent is other industries. Close to half of all the packaging materials used is converted into the printed packages, flexible packaging accounts for 22 percent, printed cartons 17 percent, Labels three percent and others about eight percent. The rest of the 50 percent of materials are accounted for by rigid packaging, metal, glass, caps/closures and others.

Printed cartons and labels have been largely printed and converted by offset printers employing various die-cutting, converting and decorating operations offline. The offset printing industry is well established in the country and has

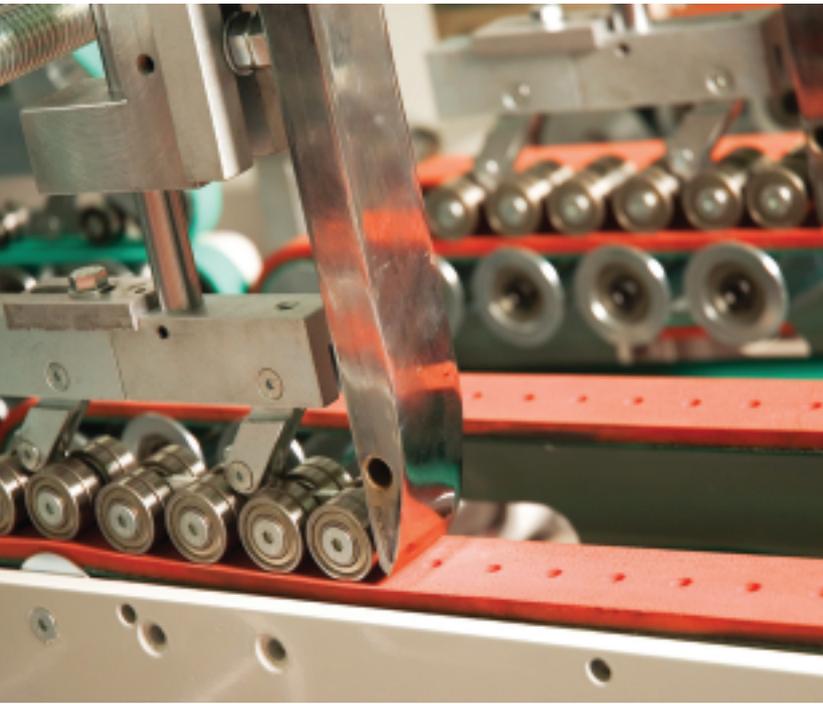
spread all over. This segment attracts continuous investment, expansion and up gradation. Self-adhesive labels remain the forte and specialization of the narrow web label printers, who continue to grow, expand and technically upgrade steadily. In this segment the technology changed from letterpress printing process to flexographic printing and further on to combination printing using various printing and converting processes online with their narrow web presses. These include flexo, offset, screen, hot foiling, cold foiling, etc.

Flexible packaging and shrink sleeves are other segments of package printing that have attained a big market size owing to a steady 17 percent growth rate in recent years. The industry in these segments has been employing only the rotogravure printing process in their manufacturing program. The rotogravure printing industry is well established and growing in India. It is the preferred technology for converting on wide web presses, providing economies of scale with high production speeds.

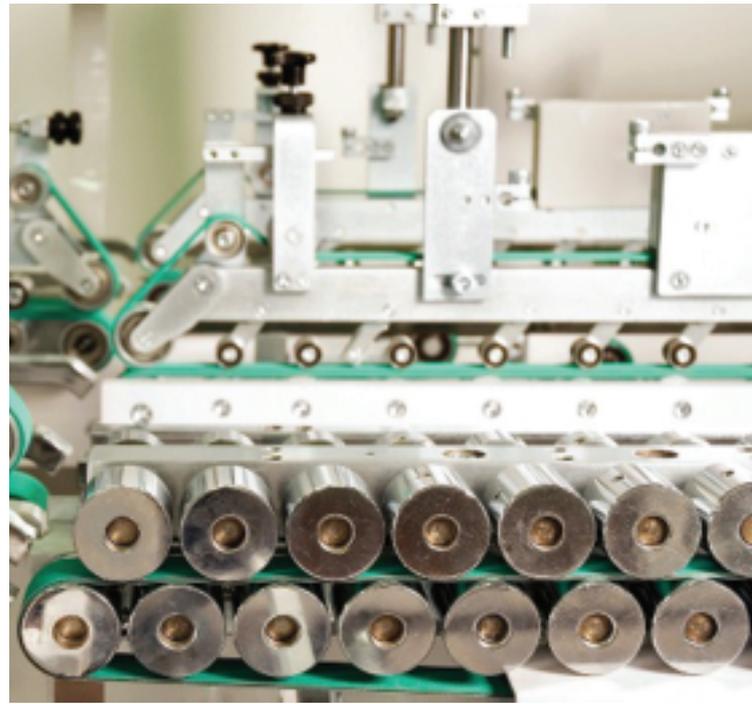
Of late, due to the need for shorter runs, faster deliveries and multi-process converting, the narrow web press suppliers are going wider to mid web presses with advanced multi-process capabilities and offering these machines to printers. These are high end presses that empower the printer to print and convert labels, folding cartons, shrink sleeves and flexible packing inline on the same press. It is just a matter of time when we shall see a paradigm shift in this direction.

As for the materials, with growth in the food and beverage industry, the demand for specialized films and film laminates has escalated. Due to recent environmental concerns the Indian authorities have restricted the use of plastics in certain large volume food packaging. The directive to use biodegradable substrates has initiated a need to develop paper based substrates that will fill the void that this restriction has created.

While the market for special films will continue to grow, social responsibility commitment towards a safer environment will lead the packaging industry to look for new and safer arenas. Waste management and recycling are also issues that need the converter's attention. Producing a great package may bring in a lot of success but the effort to reduce the impact of packaging waste on earth, will bring satisfaction.



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# Economy meets innovation – folder gluer solutions for new market trends



**Pinar Kucukaras, at Duran Machinery, explains how her company is responding to changes in demand for newer carton designs produced on standard machines. High speed runs are a must to be competitive**

**W**e all know that it takes more than productivity, efficiency, and low-cost operation to achieve a competitive edge. The folding carton industry is well equipped with high quality machinery that provides the ability to do this. However, it takes some ‘thinking outside of the box’ to stand out and make a real difference. Having the ability to add more to a business comes with the correct use of design and innovation, both in the end product and the equipment used. And, folding and gluing provides the perfect opportunity for carton makers and trade finishers to differentiate their business from their competitors.

Productivity, versatility, and build-quality should be the main points when evaluating a new folder gluer. The machine has to comply with the production range in carton styles, sizes, and substrate, and has to run consistently at the target speed, with minimal make-ready times. These are the key elements of productivity in the folding and gluing process, and are mostly easily achievable by high quality machinery. Of course, they need to be accompanied by other qualities, such as compatibility with other systems, meeting safety standards, and having good after-sales support. But all of these are the basics to which we have become accustomed. Today’s trends require more than that.

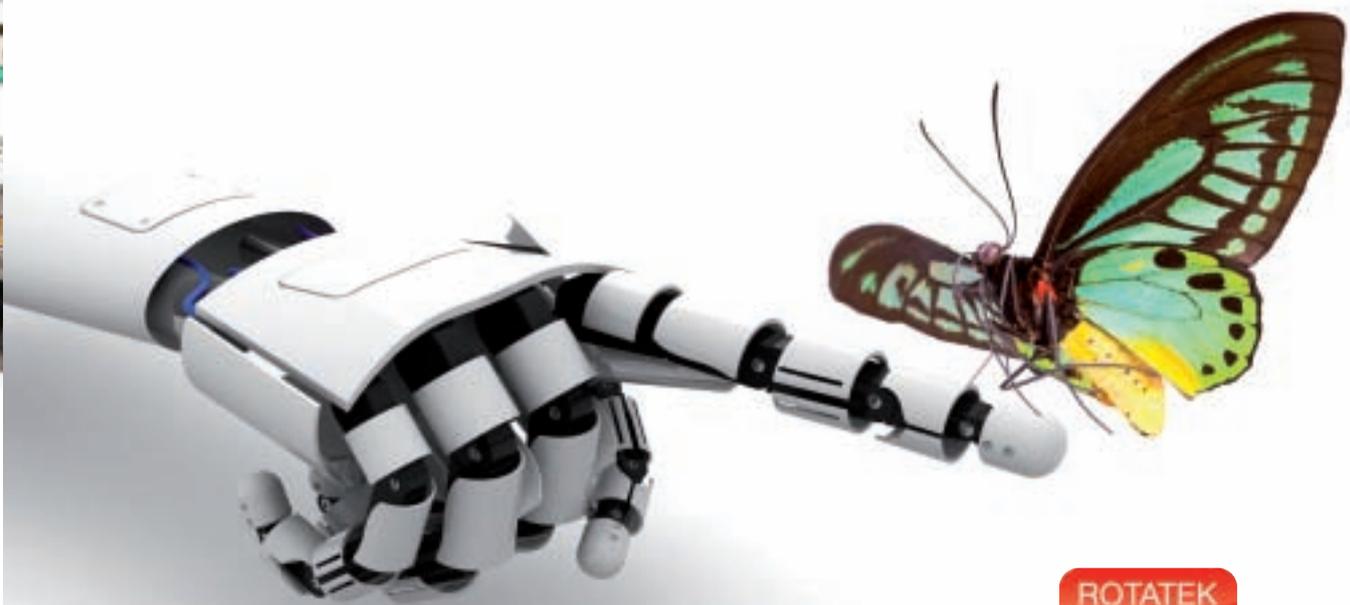
## **The need to produce faster and better**

There is one economy driven trend we have been observing since 2008, and that is how to produce the same product range more economically. This requires higher speeds, consistent running, and minimal make-ready times, as well as some new developments in the folding and gluing process. The correct folder gluer for specific requirements offers a great deal in savings. If the product range includes a wide variety of carton styles, a multi-functional folder gluer is a must. In this case, it is important to ensure the machine makes ready between carton styles quickly and easily. The downtime between changeovers has to be studied carefully for efficient production, and the best way to evaluate this is to run trials with the user’s own blanks. The latest motorized features and memorized set-up have a great impact on the uptime of the machine by reducing make-ready times, which considering the increasing demand for smaller batch runs, makes these options worth considering as part of the investment, even when the product range is not very wide in terms of different carton styles.

High-speed runs are a must to be competitive, and manual feeding and packing does not match the speed of folder gluers, so additional equipment such as pre-feeders and

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packers might also be required to speed up the finishing process. Even if these are not considered at the initial investment stage, it is a good idea to ensure they can be retrofitted, preferably by the same manufacturer, as this will preclude any integration problems.

Today's latest developments in the folding process are becoming useful tools in helping to increase productivity. Blank turning units are effective on shorter processes because they allow specific blanks to be run at a single pass instead of two. Combining processes on the gluer, such as equipping the machine with embossing or tape application units, inlet spotters, and window patchers, can be important to adding value as well.

Modularity of the gluer is another point to consider. If you are considering expanding the product range with new carton styles, such as adding a 4- and 6-corner function, it is always advantageous to specify a machine that can be upgraded to produce these additional carton styles. This makes future investment easier.

We have also noticed that the demand for flame sealers has increased in recent years, and we consider this to be part of the economy driven trend. Flame sealers are folder gluers that produce PE coated cartons for aseptic packaging, mostly for beverages and foodstuff. The PE coating takes away the need for primary packaging with certain food products, which are presented to the market with the carton packaging only. This brings an important saving to the packaging cost.

#### The changing face of cartons

The second trend, which is growing stronger, is all about the structural

design of the carton. It might come from adding shelf-appeal to the carton, from new carton designs that allow better presentation of the product inside, or again with economy in mind. The result is the same – less material and shorter processes. This trend is bringing its own challenges along with opportunities.

Cartons have a lot to offer in structural design, but the new cartons bring one critical question into the spotlight: 'Are they achievable'? Naturally, we all think in terms of machine capability when evaluating new carton designs, and decide which ones can and cannot be run on the gluers. This might be one of the biggest obstacles in the innovative aspect of the business, but it can be overcome. Our point of view is quite different from many others. We are actively encouraging our customers to surpass their expectations from standard equipment. Instead of forcing the standard machines to run the new designs, we design and manufacture a folder gluer specifically for the new cartons, but which also runs the standard jobs perfectly.

These special projects sometimes require three design offices: machine manufacturer; carton maker; and end customer to cooperate for the initial design to realize the desired result. Obviously, it takes more than the standard manufacturing procedure to achieve, but it produces a valuable result for the industry. Take note – design offices do not need to limit their imagination by existing machine capabilities!

Given that standard jobs will be run at high speed as usual, and the new cartons can be produced on the same

gluer, the new designs then become more of an opportunity than a problem. They are powerful tools that can differentiate one business from another because they allow a converter to present more and different products to the market.

But, the key is finding the right machine manufacturer to achieve this. It takes a company with expertise and creativity, and well as technical capability to allow carton converters to expand their businesses into more profitable areas, and respond quickly to changes in market demand. Many converters do not know the right questions to ask – it is the job of the machinery manufacturers to keep them up to date with what is already possible, as well as working closely with them to develop new and exciting opportunities.

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