Digital Dots

Spindrift

Invigorating the Graphic Arts industry since April 2003

Volume 11, Number 1 • 3rd April, 2013

News Focus • Opinion • Reviews • Testing • Interviews • Brain-teasers • Techno-babbling

I was seldom able to see an opportunity until it had ceased to be one.

– Mark Twain

Dear Reader,

This is our tenth anniversary edition of Spindrift so our grateful thanks to all our many readers worldwide for sticking with us and making this journey possible. The decade has passed at terrifying speed and we have enjoyed almost every minute, despite the perpetual dramas of survival. We appreciate your loyalty and the input that has helped us create and sustain Spindrift to be the most widely read journal in our industry. We are especially grateful to our numerous Charter subscribers who have stuck with us for a whole ten years.

Looking back to 2003 it is clear that our industry's survivors are those whose reinvention has kept them at the edge, constantly pushing forward to reach new horizons. Reinvention, spotting opportunities and entrepreneurialism, especially in wide format digital, are producing a new print industry at once fraught and dynamic. Even though it feels fractured and fragile, print still has clout and energy, and the strength to fight back, as Google's recent climbdown demonstrates.

Claiming that using paper is bad for the environment, the "Go Paperless in 2013" campaign unleashed a torrent of squeaking and squawking objections from across the global printing industry. Google's campaign is basically a marketing exercise for the Paperless cohort, designed to promote electronic transactions. The campaign continues but the erroneous environmental claims have been removed from the Paperless website. This is a happy result and hopefully the whole fiasco will have encouraged those involved to think a little more carefully about what environmental impact sensitivity is all about. It certainly isn't about encouraging the use of unsustainable resources.

Enjoy!

Laurel, Nessan, Paul and Todd

In This Issue

The Journey Started

With this issue, Spindrift celebrates its tenth anniversary. Laurel Brunner looks back over the last decade and charts some of the changes to the print industry that we've covered. We all face a very different world now, but we fully intend to help navigate the way through the next decade.

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Cool, Grand format

Paul Lindström has been testing the EFI Vutek GS3250LX printer as part of a series testing wide format printers. This new UV-curable printer uses LED curing, making it suitable for heat sensitive materials, as well as consuming less energy for a more environmentally friendly solution.

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Best of both worlds

Nessan Cleary assesses the market for hybrid printing, including a report from the Anton Group, a UK printer that has installed Kodak Prosper print modules to its Heidelberg CutStar units, thus enabling it to print personalised elements at full press speed direct to its Speedmaster presses.

see page 19

Regular Features & Special Treats

News Focus

Fujifilm has formerly launched its latest inkjet press, the Jet Press 540W, shown at the last drupa show as the Jet Press W. It's based on a Miyakoshi model but Fujifilm has added its own Vividia ink, which allows high density images to be printed at high speed with less ink transfer from sheet to sheet. Fujifilm has also added its own screening technology, which is based on FM screening and allows for smooth colour tones and sharp text as well as eliminating moiré and rosette patterns.

The Ghent Workgroup has called for interested parties to fill out a survey at www.gwg.org which will help in developing the next round of standards for working with PDF/X-4 files.

GMG has released ColorMaster 2.0, a virtual colour space, which allows users to preview and softproof files without having to predefine the colours. It uses predefined settings and optimised profiles to target specific colour spaces making it suitable for late binding RGB workflows. Images can be previewed in Photoshop to check colour accuracy, but it does rely on being interlinked with GMG's ColorServer for colour conversions and ColorProof for output of hard copy. Although it's meant for RGB workflows, it can simulate CMYK output.

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EFI has updated its Fiery XF wide format RIP to v5. It has a new customisable interface and should seamlessly integrate the Vutek printers with EFI's MIS offerings. The new version combines Fiery Color Profiler Suite with new spot colour tools and includes more than 50 new print drivers.

Four Pees has updated its Remote Director soft proofing tool to v5. This continues to improve the spectral blending engine for up to 24 colour channels. It can work with any spot colour library to provide accurate blends between spot colours and with the ICC profile.

Durst has prevailed in a patent dispute in Germany against EFI over a German patent that covers the use of overlapping print heads to prime a substrate before adding coloured inks. The Düsseldorf District Court held that EFI GmbH and EFI Inc., amongst others, "shall refrain from supplying, bringing to the market or using the QS and GS series printing devices in the Federal Republic of Germany".

Ipex has opened its pre-registration for visitors, despite continued speculation as to whether the event will go ahead, prompting an open letter from the organisers to restate their determination to proceed with the show. However, this was followed by two more exhibitors, Impika and Duplo, pulling out of the event.

Inca Digital has launched a new tool, ReporterPro, which gives feedback to managers on the productivity and efficiency of their Onset and Spyder wide format printers. It uses a web browser interface to show information on jobs, customers and machine production such as the amount of ink used per job. Users can tailor the 'dashboard' view to prioritise the data that matters most to them and can search for details using standard SQL database queries. Results can be imported to an Excel spreadsheet, estimating system or MIS.

Israeli company **MTL Print** is to launch its latest wide format printer, the NurStar 305D at the ISA show in Las Vegas, April 4-6. The 305D is a 5x10 ft UV flatbed printer with 6 colours capable of producing up to 250 sqm/hr. The 305D is based on the 304D but with a bigger bed and a white ink option.

German ink manufacturer the **HuberGroup** has released its new CRS Max ink mixing system. This is based around ready-to-use mono-pigmented base colours that make it possible to mix custom colours for individual applications suitable for different substrates and finishing processes. Any inks that are left over can be reused to make fresh inks which in turn leads to cost savings.

Quark has released a minor update for XPress 9, taking this to v9.5.1. The update is for the App Studio and improves the way it optimises file sizes for smaller downloads and adds support for any TrueType and OpenType fonts. It also boosts the interactivity with support for scrolling on web views and the ability to add interactivity to anchored boxes. It also includes Windows 8 support.

Belgian distributor **Four Pees** has taken on the worldwide distribution rights for Global Vision, a developer of automated proof reading solutions based in Montreal, Canada. Global Vision has a number of solutions for text-based, pixel-based and braille inspection including the new QCanywhere cloud-based applications. Global Vision has a strong focus in Europe and is widely used in the pharmaceutical packaging sector.

Kodak has added two more papers from Sappi Fine Paper Europe to its paper rating program for its Prosper presses. Jaz Book, a 67gsm paper designed for printing colour books, and Jaz Silk, which is mainly aimed at direct mail and commercial printing, both gain the 4 Diamond rating indicating they are suitable for consistent high quality work.

Videojet is to show its new 50 series small character inkjet printers at the Total Processing and Packaging Exhibition, starting June 4th, at the NEC. The 50 series are part of the 1000 range and the two new printers - the 1550 and 1650 - are designed to minimise downtime. They run at speeds of up to 293mpm (1650) and 278.6mpm (1550) and have a core life of up to 14,000 hours. They include Dynamic Calibration to optimise the print quality and CleanFlow to reduce ink build up over longer print runs.

Christian Knapp, managing director of **KBA UK** is to leave the company at the end of July to pursue a change of direction. He has worked for KBA for 12 years and leaves the UK company in a healthy state. Knapp is initially planning a break at his family's home in Florida before deciding on his next move, which could see a return to the UK or a move to Canada where he also has family.

Helios has released its Virtual Server Appliance, or VSA. This is a turnkey file server in the form of virtual machine server images that run within all the major VM environments, including VMWare ESX Server, Citrix XenServer and Microsoft HyperV. The VSA includes an optimised Linux runtime and can serve Windows, Mac and Web clients.

Pixart, the Italian web-to-print specialist, has developed a new basket that is aimed at the gift market and can be ordered online. This uses 1.4mm thick e-type corrugated cardboard. It can be customised with images on the outside and is easily assembled thanks to its interlocking closure system.

Kodak filed its annual report for 2012 a few weeks ago, which show a mixed picture, although Kodak still claims that it is on course to emerge from its chapter 11 position by the middle of this year.

Kodak has said that its future business will concentrate on two sectors, Digital printing and Enterprise and Graphics, plus Entertainment and commercial films, which together make up its Commercial imaging division. This area still made a net loss, though it improved by $278m (€217m) on the previous year.

Those costs associated with selling, general and administrative fell by $226m (€176m), thanks to cost reductions but Kodak's overall revenue also fell by 20 percent to $4.11 billion (€3.21bn). Overall Kodak made a consolidated net loss of $1.38 billion (€107bn) during 2012. Despite this, Kodak is forecasting an operating profit of $167m (€130) this year.

A Review

Systematic Quality Management

Since it was first published in the late eighties quality management according to ISO 9000 has become the most established and internationally recognised management system. But many companies handle their management systems in a very manual way, far from what is possible in today's networked and internet-connected business environment.

Lennox Hill Ltd, a small software developer based in the UK, but with customers worldwide, offers a web-based solution for small and medium sized companies. This sounds like something suitable for publishers and printers, so we asked for a demo.

While many printers have invested in more advanced MIS systems in the last few years, support for quality and environmental management doesn't seem to be commonly offered as optional modules by those MIS vendors. It's this gap in the market that Christopher Stainow, CEO of Lennox Hill, noticed and so he developed a web-based document control system called isoTracker.

The system has four main modules, all accessed via a web interface. The database is hosted by Lennox Hill and mirrored and backed up in several geographic places for security. It's a hosted service, so the client doesn't need to install or configure anything locally.

The first module is called Document Control, and it's here you set up the structure of your management system, your quality manual as it were. If you have a series of documents from before, you can import those and keep this structure. But from now on isoTracker does the versioning control through a review and approve function.

This is done by checking-in and checking-out the documents in progress or in revision. Different users will have different roles in the system, and if an approval is needed on documents, the appropriate user will be notified automatically. The document will not be regarded as valid for use until all relevant people have approved the latest status of the document. The structure inside isoTracker can be customised to fit the company, for example by naming the departments involved, different sites or locations and so on.

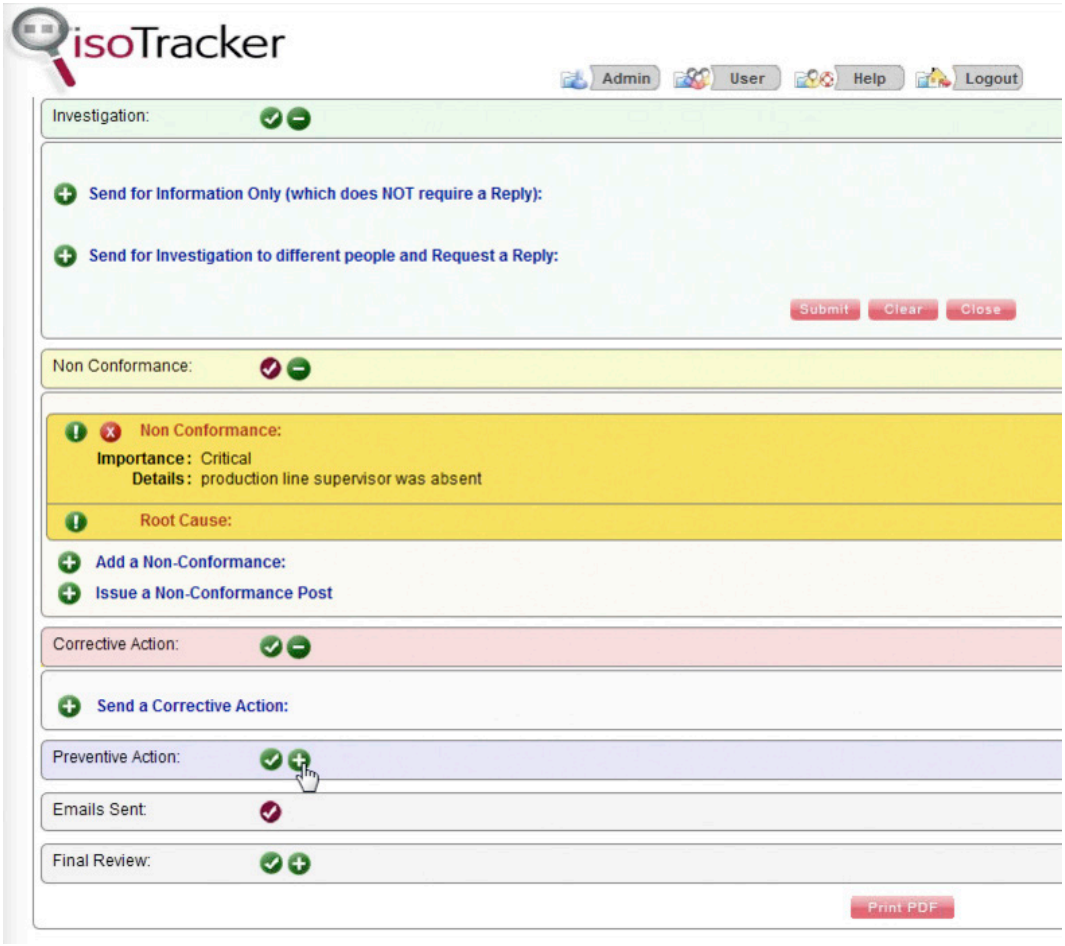
The second module handles complaints, including non-conformities discovered internally. This is, of course, a very important module, since it's here the cause of an

Christopher Stainow saw a gap in the market between document control systems and MIS systems, and developed a web-based quality management document control system called isoTracker.

error is analysed, and both a corrective and a preventive action is expected to come out of this analysis. The cost of this complaint or error is also estimated. Whatever documentation is referred to in this analysis can be attached to the report, in the system.

The third module handles audits, and in particular the internal audits. Here prepared questions or actions can be organised and tracked, so audits are done systematically and documented. As with complaints, non-conformities are tracked, and corrective actions are suggested and followed up.

Last, but not least, the fourth module handles competency testing. Here, tests of staff knowledge of both the quality



The isoTracker document control system has four main modules, for systematic review of activities related to the ISO 9001 quality management system. Shown here is the module for customer complaints.

management system and company specific skills can be scheduled and managed. Again, different Job Roles are assigned in the system and in this case an individual is appointed Trainer. Key competence areas are in this way tracked and documented. At the moment this module is not supposed to keep track of external training or education, but can be used as a placeholder for such supporting documents.

The pricing of the system starts at about €350 for one year with five users and one module, typically the Document control module. Added modules have a falling price scale, and so do additional users. We think it's fair to say that this is an affordable system that may help a company manage the quality of production in a systematic way.

Green Shoots

In case you missed the online blogs we've run over the last few weeks as part of the Verdigris project, here they are again.

Regulation Stepping Up

On the 3rd March the European Timber Regulations (EUTR) came into force. The EUTR will affect paper providers worldwide, because placing illegal timber or timber products into European Union markets will be a criminal offence. Any organisation that might be affected by the EUTR must put in place procedures that guarantee the legal sourcing of the timber products they trade, including paper and board which may account for around 50% of the world's timber production.

The EUTR's requirements have been broadly welcomed by print buyers who want to reduce their environmental impact. International companies who want to be sure that raw materials come from legal sources can now rely on an internationally relevant law that ensures verification. The law is widely expected to level the playing field for wood-based products, making compliance a technical rather than an ethical choice. This is both a good and a bad thing. Good in that environmental laws are coming into being and bad for the same reason: we would prefer to see the graphic arts and printing industry regulate themselves.

Participants in the pulp and paper supply chain must now decide what they should be doing to mitigate risks that raw materials destined for European markets might come from illegal sources. So the entire supply chain has a burden of responsibility, but that responsibility is a cooperative one. The cooperative includes any company involved in the supply of paper-based products that wants to do business in Europe.

Verification that companies comply with EUTR will generally come from a recognised monitoring organisation. This is generally a national body with jurisdiction in a specific country. They will be interested not just in whether timber products are legally sourced, but also that

Verdigris

The Verdigris project is supported by Agfa Graphics, Digital Dots, drupa, EFI, Fespa, Heidelberg, HP, Kodak, Pragati Offset, Ricoh, Splash PR, Unity Publishing, and Xeikon.

operators have a robust due diligence system in place to make sure that illegal paper and board products cannot reach the European market. This is an important part of the EUTR. Traders should be able to identify supplier links throughout their supply chains and also be able to share information across those links.

From an environmental perspective the EUTR is a positive step. However, for printing companies supplying services for European customers it requires compliance, which might not be straightforward. The EUTR does provide an answer to the egregious abuse of the world's forests. But it is also an example of how regulation eventually comes to industrial sectors that do not take care of their environmental responsibilities on their own.

A Supply Chain Problem Taxing Our Brains

A printing company that wants to improve its environmental footprint can do a lot on its own, but increasingly companies want to work with suppliers such as Xeikon or Agfa and others, who are also doing their bit. And so it goes up and down the supply chain, with environmental commitment involving customers, print service providers and subcontractors.

But how far should printing company owners go? What are the questions they should be asking if they truly want to understand more about their environmental impact? For many printers the answers to such questions are simply too difficult so they're inclined to ignore them. They would rather not even think about the problem because trying to come up with answers will tie them up in knots.

This is a shame because so many printers and their technology providers have already gone a long way down the environmental knowledge road. There are reasonable answers to many of the questions printers are asking, so they should go as far as they can, within the bounds of what is within their control. For instance, if your plant produces a lot of waste, start looking at why and what can be done to reduce it. This could be as simple as getting people to collect waste paper and put it in a recycling bin or sweeping the floor to reduce dust in the environment.

At the other extreme are the questions printers might ask their suppliers, such as the extent to which raw materials are substituted, recycled or reduced in press manufacture. Or chemistry use and disposal and how easy it is to recycle prints and machinery. None of this has to be particularly ambitious, especially if you are a printer who is really uncertain about what you might do to reduce the environmental impact of print.

Let's face it, the complexities of Life Cycle Analysis are beyond most printers. Indeed they are beyond most people apart from environmental scientists and their ilk. But the basic principles are not and we are all on a long learning curve with this stuff. We should all be doing our bit and coming to terms with our need to be accountable, in common with all industrial sectors. The alternative is external regulation and that would put more than a handful of nails in print's collective coffin. No one wants that, so let's not lose sight of the importance of continuing to reduce the environmental impact of print.

Print to Store

We need to change our thinking about print. Yes, it is sustainable, yes it is lovely and yes it is good for the planet. None of this has to change. What has to change is our view of print's purpose. Most of us tend to think of it as a tool for communications or as a beautiful object, for instance, a well-produced book. But it is also a technology-independent means of storing data, the ultimate environmentally friendly archive.

Think about it. Ever since the advent of digital photography people have been taking and collecting photos. There are trillions of them floating around in the ether and even though we value these images, too rarely do people print them out. Whole generations are creating images that depend on digital technology in order to share and view them. What happens when the digital technologies fade into obsolescence?

The same is true for non-image content, diaries, love letters, birthday greetings and family correspondence. The idea of archiving in print all this sort of trivia may sound silly, but print is a more trustworthy medium than a sim card or USB stick when it comes to archiving. How many Bernoulli drives have you got knocking about and how many SCSI cables and computers with SCSI ports? Once upon a time a 20MB Bernoulli was the leading edge in digital storage. If you used them to archive images and data files you also needed to hang onto your Bernoulli compatible computer. How many of us have done that?

Print is technology independent so whatever you archive in print will be accessible for a very long time. Yes, it is vulnerable but no less so than digital storage. And its ultimate fate has a far less malign influence on the environment than all that mag tape, PET film, CDs and DVDs.

It is highly unlikely that people will ditch their digital media archives overnight. But perhaps we all might want to consider print's role as an environmentally friendly archiving tool. For the things that really matter there really is no other choice.

eBay Questions the Effectiveness of Digital Advertising

Printed advertising has been the traditional bedrock of the publishing industry. Without it newspapers and magazines cannot exist, hence the carnage inflicted on those sectors since the advent of internet advertising. However a recent study by eBay* questions the value of Search Engine

Marketing (SEM), suggesting that print is more sustainable, not just for the planet but for marketers as well.

The eBay study was conducted in the US where internet advertising revenues reached $31.7 billion in 2011, up 21.9% from 2010. SEMs accounted for $14.8 billion (46.5%) of this spend and the top ten spenders paid out $2.36 billion. It is easy to understand the temptation of internet advertising: a huge global user base that SEM ads can target based on self-selected user preferences. Responses can be tracked, giving advertisers clicks data that they can match up with sales data to determine the return. This seems attractive but how can media buyers be sure that a match between ad and sale is real?

Print has the same problem, but print has some important advantages over SEM ads in addition to being technology independent and having a limited carbon footprint. Print advertising also has a one-off cost and is independent of response whereas SEM ads cost more with every click but these extra clicks do not necessarily translate into sales. There are many wasted clicks from people who already know the brand or who are using the ad as a shortcut or navigational tool. The cost of such digital views is a waste of money.

The study also considered the value of position auctions that align advertiser incentives with potential customer preferences. Advertisers bid against competitors to be at the top of the list of ads appearing alongside searches, increasing revenues for search engine owners. Advertisers hope a high position will yield more clicks, but when people use ads just to aid navigation the value of the higher position is nil. The researchers found that natural searches are a perfect substitution for SEM ads and that branded SEM campaigns have no value for short-term sales.

So it seems that SEMs, which account for huge amounts of marketing spends and online traffic, are not as effective as the alternatives, such as display ads or print in all its manifestations. Print advertising's effectiveness has been judged on observational data, rather than evaluating the causal estimates of an ad's effectiveness. Based on the eBay study when the same parameters are used for SEM campaigns they come a poor second to alternatives, including the much more sustainable options print can offer.

* Consumer Heterogeneity and Paid Search Effectiveness: A Large Scale Field Experiment *http://conference.nber.org/confer/2013/EoDs13/Tadelis.pdf*

For more green news, check out The Verdigris Project:

Verdigris

http://verdigrisproject.com

An Interview

Production inkjet

A couple of weeks ago we visited Océ's Customer Experience Centre at its Poing factory, near Munich, Germany. Océ held a two day sales event to demonstrate its inkjet printers to customers, including the new Jetstream 5500 Colour.

We also had the opportunity to talk with Peter Wolff, vice president of Production Printing for Océ. Wolff told us that 70 percent of Océ's sales now come from inkjet, noting: "So that's the market now."

He says that dry toner machines are quite complex to manufacture with many moving parts. But also he says that toner, particularly in the mono market is now driven by price because the speed and the quality has reached a level that most customers are happy with. He explains: "Dry toner is more or less at the end of its life cycle. You can't improve performance or cost any more. So my personal opinion is that there is no further development."

In contrast, Wolff says that inkjet has many advantages including wider widths and faster speeds giving it more possibilities for future development. However he does accept that further development is needed on the inks and papers saying: "At the moment it's less about pricing, our main priority is improving quality in combination with paper. Because in order to gain more traction against offset we need more quality and especially more papers. It's becoming more and more urgent to enlarge the paper range."

Wolff is also upbeat for the future, pointing out: "80 percent of the inkjet machines in Europe are direct mail and transactional and these are our home markets." But he does accept that Océ is not necessarily thought of as a brand in the graphic arts. He adds: "We are market leaders in book printers in colour by installation but it might look different if you look at the number of copies of books printed."

Océ's Customer Experience Centre at its Poing factory, set up for the International Inkjet Days event to demonstrate its current range of inkjet printers.

He is upbeat about prospects for inkjet saying that with the latest ColorStream models more customers are realising that the technology is relevant to them: "We really find that with our improvements and the learning curve of the litho users to understand inkjet we are coming closer together. The quality has become good enough for them in the last two years. They understand the opportunities and the business better." But he does accept there is a learning curve, adding: "Our customers are experts in managing variable data. Either you learn to manage big volumes of data or you need to rethink your business model."

It's a good point, because although its tempting to look at new printing kit, few vendors are in any doubt that its really data management that's going to drive the printing industry forward over the next few years.

Driftwood

One World – One Workflow

Some years ago I attended a trade show with a colleague who was quite new in the graphic arts business. After an hour walking up and down aisles full of seemingly very similar printers, presses and software on display she asked: "Do we really need so many different types of printers, couldn't one do the job?"

Of late I have had similar thoughts about workflow systems – is there really room on the market for so many types and brands, with seemingly very similar functions? Possibly not, but let's look at the challenge in trying to find one universal system which would cover all the needs in a publishing and printing workflow.

First of all we need to specify what we mean by 'workflow', where does the process start and end in our type of production? Graphic art production splits into many different niche markets, all with slightly different needs and applications. A newspaper, for example, has both an editorial production process, and a print and distribution process. Some workflow systems try and cover the whole of this very complex process, but it's hard to find one single vendor for all the components. And would such a system suit a large format sign and display printer? Not likely.

So is it all in vain to try and reduce the fragmentation of workflow components, to try and streamline your production processes? No, there are benefits to achieve, time to save, and hopefully production efficiency to gain, by assessing your present workflow, to try and reduce redundancy and unnecessary fragmentation of resources.

One way to assess a workflow is to identify where and in what software the same or very similar tasks are done. It can be in the way requests for a quotation are managed and calculated, or how an order is planned. If several systems are used it means both increased maintenance costs and time needed for training of staff. Probably, and quite likely, the risk of errors or redundancy of data increases when several systems and databases are used for the same tasks.

Another task that is often handled by different, but very similar systems, is the output management of printing devices, either CtP devices or colour printers. In today's world of cross media workflow the number of possible output devices increases day by day, especially if we include tablets, eReaders and smartphones in the publishing process. If we are to maintain and learn how to operate special and dedicated software for each device, we again face a situation that is likely to be prone to errors and will demand a lot of training and maintenance resources.

Paul Lindström believes that working according to established standards and reducing the complexity in the workflow could save time and resources, as well as reduce errors.

I think the key here is integration, and the ability to access and control any device over the network. Going back to the example of many different RIPs for the different output devices, a better way would be if all the planning and preparations could be done in one system, including file

preparation and colour management, and then a seamless integration with the particular output controller needed for the particular device. This would ensure quality, reduce the cost of maintenance and training and most likely streamline the production process.

We don't talk much about JDF today (Job Definition Format) as it's an established technology, almost taken for granted. And yet not all software solutions or systems can handle JDF or XML, which often means they are difficult to integrate with other workflow components. When considering an investment in a new or different MIS system, RIP system or Web-to-Print solution, it's probably a good idea to look at the JDF integration Matrix, published on the CIP4 website. Most successful and confirmed integrations between workflow modules will show up there, and if a vendor isn't listed, they need to present a good explanation of why not.

Automation, standardisation and streamlining are all part of an ongoing, continuous work of improving the business, adapting to the changes in the type of services and products on offer. While it's unrealistic to think that one system or device can cover all your needs, it's probably time well spent to at least try and reduce redundancy in your workflow and to choose solutions that are open to seamless integration. This will put pressure on the vendors, and reduce the number to consider in the next round of investment.

– Paul Lindström

The Journey Started

It has been ten years since our very first edition of Spindrift so we thought it might be interesting to look backwards, not something we generally do. In doing so we have noted changes in the industry, from the big deals such as the Heidelberg and Kodak split or the Canon Océ takeover but also changes in how very small companies, including Digital Dots, are operating.

There is now considerable polarity in our industry. Lots of business is done by large multilayered, high overhead organisations at one extreme and by often very small ultra lean businesses at the other. In many cases the latter are more nimble, efficient and profitable than the former. And in between are the companies struggling to keep their businesses going. They are fighting hard to stay afloat, pushing themselves to constantly reinvent their services to meet the needs of a shifting market landscape.

This landscape is the result of two important drivers for our industry. Obviously there is competition for digital media. Less obviously there is the demise of prepress technologies: prepress software is almost reduced to being an app on a smartphone. It isn't quite there yet but tools such as Image Processing Camera for Android phones or Photo Raw for the iPhone are a long way from the dedicated and incredibly sophisticated reprographic systems that were part of the prepress foundation not so long ago.

With the demise of film-based workflows and analogue processes, much of prepress now resides in software. The value-add for printing and prepress companies is in process automation, and the speed, accuracy and efficiency with which they can get digital files to press. Add in their ability to manage and produce content across output paths and we have all sorts of new business applications. This is why colour management is as important now as it was ten years ago. It is also why databases are so vital for workflow efficiency and variable data production.

Process Automation & the Web

In 2003 the importance of process automation was already clear: JDF was all the rage and we were all well into the JDF party spirit. What a shame that ten years on the initiative seems increasingly atrophied in the face of much wider adoption of XML to manage data interfaces and interchanges. The industry has embraced workflow automation and extended production supply chains to include the Internet, where XML reigns king. Web-to-print is now a fundamental business model for the graphic arts, and it is a model that relies on XML for its transparency and efficiency. The overhead of managing JDF implementations as well may be just too much.

The profound and enduring effect that the Internet is having on the graphic arts business is finally being fully and positively appreciated along all points of the industry's supply chain. Yes it has helped to decimate many traditional printing companies, but it has also created an environment for innovation and new business models. Companies as diverse as Pixart of Venice, Italy, or JustPrint, India and Image Data of Brighton in the UK are exploiting the Internet to build substantial and profitable businesses that could not have existed without it. And web-to-print is only a whisper of the louder internet conversation, a conversation that includes process automation and softproofing, another hot topic ten years ago.

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Proofing Precision & Technophobia

We were as obsessed with proofing in 2003 as we are today. Online approvals management was already a reality and it seems that not much has changed in terms

of technology. Monitors and measuring devices have improved but despite the industry's best efforts at colour management, too many companies still struggle with the basics of digital colour. There is still too much resistance to understanding the business benefits of process automation. Too few printers understand that they can implement colour management and process automation technologies and improve business performance, customer relations and profitability.

It must be a problem of confidence, a worry that technology is too difficult to understand or trust, particularly if it's a technology you cannot touch and feel. Companies that fall prey to that fear struggle harder to compete than those who embrace change willingly. Over the ten years we've been tracking technologies, there has been a subtle shift in our coverage towards applications, business and implementation issues.

Technology is now secondary. We have moved from describing how stuff works and why, to how it is used and its effect on a business's performance. This is why we are so caught up with technology tests in the pages of Spindrift and why standards have come to play such a role for us and our readers. Technology alone is no longer the driving force of our industry. What matters far more is using technology to make production processes more robust and cost effective.

Technology alone is no longer the driving force of our industry. What matters far more is using technology to make production processes more robust and cost effective.

Digital Wide Format Horizons & Newspapers

However there is one sector where technology developments still trump business performance techniques. The wide format digital printing market was still very much in its infancy in 2003 but today it is a major part of our coverage. We have been testing wide format machines for a couple of years and are looking to push further into this field to help readers better understand topics such as return on investment and the technological demands of emerging wide format printing applications. Wide format digital has taken the role that newspapers played in our early years, which coincided with immense changes in that sector. However, newspaper technologies have become increasingly bespoke and proprietary over the years.

Based on standard technologies, such as XML and Windows, newspaper front end systems can be configured for highly specific applications and mostly with a mobile dimension. Such systems are developed in close cooperation with clients to support the very diverse editorial and advertising requirements of large and small newspapers as they struggle to compete with online media.

Systems developers are implementers of off-the-shelf tools such as Indesign or Xpress, combined with databases and workflow management for output to print, the web and mobile devices. The migration of technologies out of the newspaper sector into other areas of publishing has slowed, the gap it once filled serviced by increasingly sophisticated workflow automation tools and the amazing advances in Quark Xpress and Adobe Indesign. Interesting as newspapers are, they are not as interesting as developments in wide format printing and the capacity of inkjet technologies to print on any surface and in three dimensions.

Digital Printing

Narrow format digital printing was already well established in 2003, however it was still perceived as a poor cousin to offset. Over the years improvements to media, toners and inks as well as imaging technologies have brought digital printing up to scratch. It now competes with conventional printing in many sectors, especially conventional offset. Analogue press manufacturers have responded by improving makeready times and cutting waste, changing run length economics such that offset and digital printing are direct competitors for many jobs. Software that determines the route to output a job should

take is already on the market and we expect this to be one of the areas of development to watch.

Another area to watch is the emergence of carbon footprinting tools built into workflow and RIP systems. The rise of environmental awareness in the printing industry has been steady since around 2007 and we have been tracking work in this area since 2008. Our Verdigris project supported by founder members Agfa, HP, Kodak, drupa, Ricoh, and associate members Pragati Offset, Xeikon, EFI and Heidelberg have helped promote environmental awareness in the industry. It has also helped fund the development of ISO 16759 (Quantifying and communicating the carbon footprint of print media) and of a new standard for doing the same thing for electronic books. This work is still very much in the early stages however, ISO 16759 is expected to be published this summer.

The future for our industry is also in its early stages. As you, our readers, move towards new worlds and embrace new ideas we will be there too. Through the pages of Spindrift we will continue to bring you news and analysis that hopefully helps you grow and thrive in an industry that has no peer and everything to look forward to.

– Laurel Brunner

Cool, Grand format

One of the fastest growing segments of the graphic arts industry is large format printers, and we at Digital Dots are continuing our testing of these and in particular the UV-curable printing systems.

First out in this second round of testing (our first report was published in 2010) is the EFI Vutek GS3250LX model. On the outside the Vutek GS3250LX looks very much like its predecessor, the GS3200 that was reviewed in the 2010 report, but on the inside quite a lot has happened when it comes to the curing technology. The GS3250LX uses what EFI calls Cool Cure LED Technology, which helps both to increase speed and reduce power consumption. Traditionally the UV ink is cured using mercury arc-based lamps, which generate a lot of heat, and take quite a while to reach working temperature.

In contrast, the EFI Cool Cure LED uses a narrow set of wavelengths corresponding to what's needed in the special inks developed for this technology. The LED lamps create almost no heat, so offer more flexibility in terms of what substrates can be used. The LEDs are designed to last the lifespan of the printer, so shouldn't be regarded as a consumable in need of replacement. Since the UV inks don't emit VOC in the first place, EFI market the Vutek GS3250LX as a "greener" printing solution than many other competing printing systems.

In terms of technical specifications the GS3250LX is similar to the previous GS3200 model, with resolution up to 1000 dpi through the use of small droplet sizes, down to 12pL, and speeds up to 223 m^2/h. The eight colour ink set consists of the normal CMYK and then a light version of those colours plus white ink. However, in fast mode only five inks are used. It handles both flexible and rigid media, up to 3.2m wide and 50.8mm thickness.

The GS3250LX can handle up to two rolls of media simultaneously, and as an option has a Heavy Duty Unwinder for very heavy roll-to-roll production. Also as an option the standard table can be extended either with an extra table with casters, or with a Small Depth Extension Table. This is for use with small boards or panels and has multiple fence stops. Those fence stops help when printing on multiple pre-cut pieces. There is a channel in the fence which allow the operator to slide in adjustable stops that mimic the corner of the fence.

One of the myths we dealt with in our tests in 2010 was that UV ink was supposed to have quite poor colour gamut, and so inferior image quality than, for example, solvent-based ink. We concluded that this wasn't entirely

true, since some UV-curable ink-based printing systems in fact produced a larger colour gamut than some solvent-based systems. And compared to standard flexo and offset printing, most of the UV-curing systems produce an equivalent colour gamut, or even larger. The colour gamut of the GS3250LX surpasses that of offset on coated paper, so should satisfy the needs of most types of applications (see the tables of results later in the text).

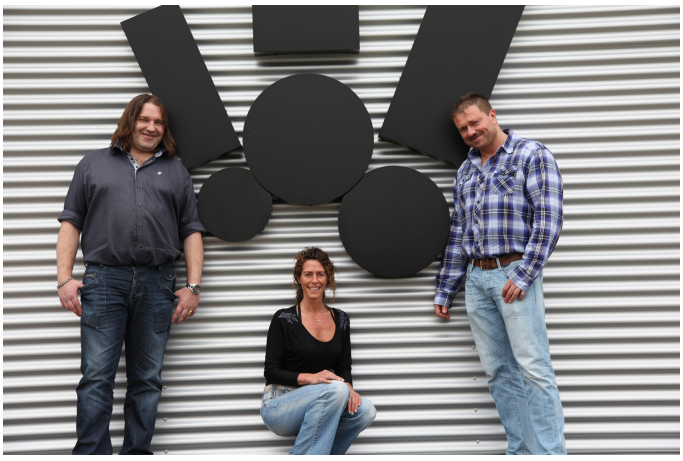
To exceed customer expectations

JMC Signmakers, based in the Netherlands, is one user of the GS3250LX who saw the attraction of both high image quality and a more environmentally friendly printing technology. But before investing in a new large format printer, JMC took the trouble to actually ask its customers what their needs were. To the surprise of Cees Bolijn and his wife Miranda, as well as Cees's brother Martijn Bolijn, the founders and co owners of JMC Sigmakers, none of the clients participating in the survey needed higher resolution or better colours from a new printer.

"As soon as they saw the results of what is possible with this new machine, our customers started finding new applications they had not thought of before" – Cees Bolijn, JMC Signmakers

But JMC had also noticed a trend towards more indoor applications, so decided that the same clients, many being ad agencies, would most likely appreciate high resolution and wide colour gamut in the long run. So the choice was to go for the VUTEk GS3250LX, both for the resolution and also because of its green credentials.

"As soon as they saw the results of what is possible with this new machine, our customers started finding new applications they had not thought of before", says Cees Bolijn. JMC Signmakers estimate that the power consumption was about 75% lower on the new printer than for the previous model. JMC integrates the EFI Fiery RIP with the Automation Engine workflow system from Esko. Since 2005 the return has never fallen below 30%, and JMC intends to keep it that way.



JMC Signmakers, based in the Netherlands, decided on an EFI Vutek GS3250LX both for the image quality and its "green" credentials. From left Martijn Bolijn, Miranda Bolijn and her husband Cees Bolijn.

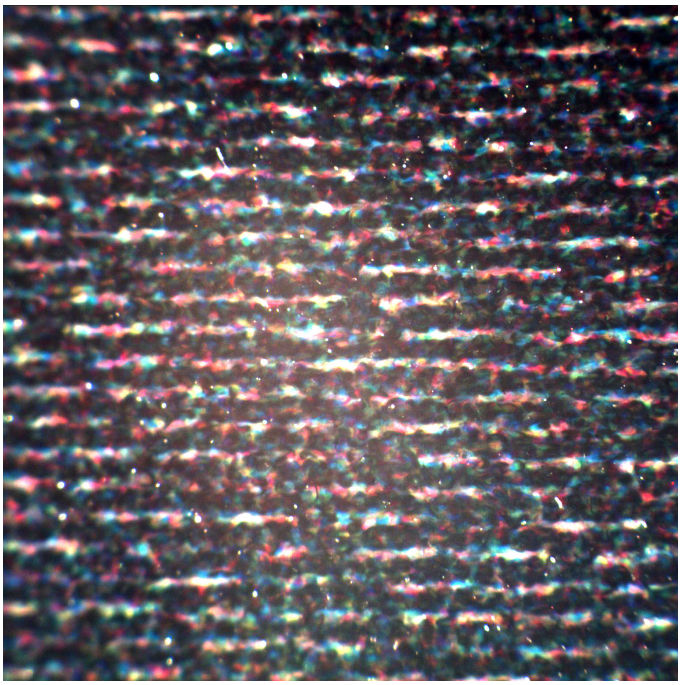
How the tests were done

Our test required participants to provide output samples from test files supplied by Digital Dots. For the colour gamut test, we use a standard IT-8 CMYK profiling chart; for the resolution test, we use a specially designed chart with line pairs at a wide range of spacing. EFI printed these under optimum conditions onto two types of substrates: glossy vinyl and uncoated paper.

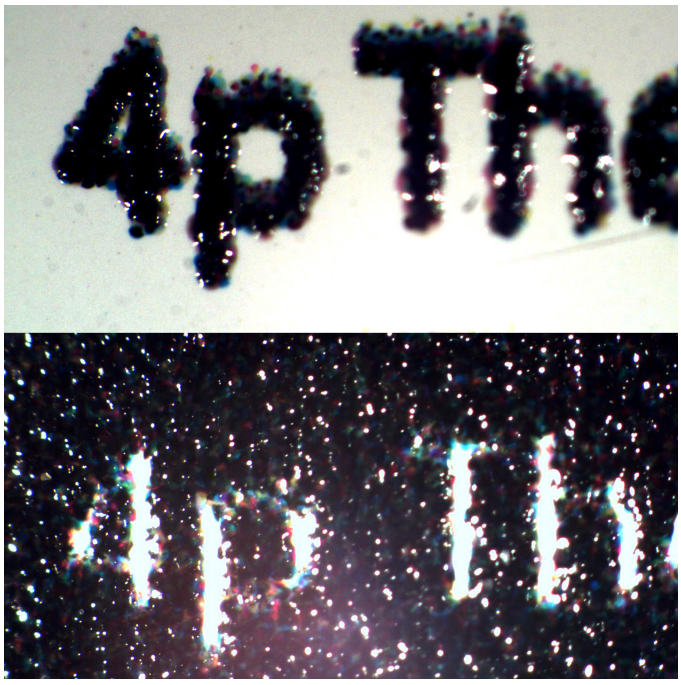
For visual evaluation of general image quality and smooth reproduction of tonal graduation, we also asked for an output of a 70x100cm poster. This poster was also used to evaluate the uniformity of ink density across the whole width of the substrate.

We take five measurements of full tone cyan and then use the SpectroShop software to compare the colour deviation between the first sample and the other four. As a threshold we decided on 2.5 ΔE, the same value suggested in the ISO 12647-2 standard for when printing solid spot colours.

We measure colour gamut by creating a standard CMYK ICC profile from the IT-8 chart data. This was done using an X-Rite i1 Pro spectrophotometer and professional profiling software. The profile was then analysed with Chromix ColorThink Pro to yield a figure for the total



In the resolution test the GS3250LX showed identifiable line pairs up to the equivalent of 250 dpi, in the horizontal direction, and up to 200 dpi in the vertical direction. Here an image of the sample as seen using a digital microscope at about 500x enlargement. Note that the droplets are far smaller than the lines that are to be reproduced.



The GS3250LX could reproduce small text of 4pt size well, both as black on white background, and inversed white on black. Here, an image of the sample as seen using a digital microscope at about 500x enlargement.

number of discrete colours contained within the gamut. We define discrete colours as separated by a delta-E value of 1, using the CIELab colour space as reference.

To measure resolution we viewed the prints of the line pairs chart under a digital microscope. We wanted to determine the point at which the lines could no longer be differentiated as distinct pairs. We call this the resolving power of the printing system, and this is often different than the stated addressable resolution, as per the technical specification. The resolving power is a combination of the native resolution of the print heads, droplet size and mechanical precision when moving the print heads and/or media while printing. As a complement to the line pair chart we also print text, both positive black on white and inversed white on black, in a small font (down to 4pt).

Results in numbers

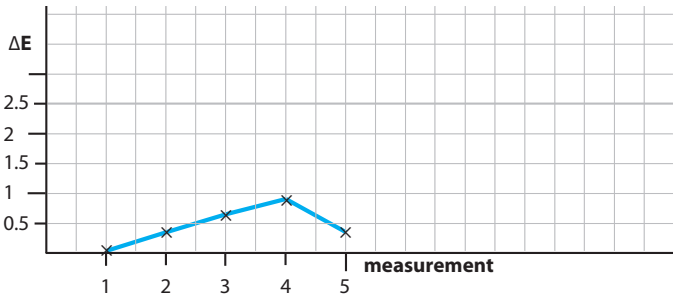
EFI submitted test samples produced using the eight-colour (CMYK plus light versions) ink set in the 1000 dpi mode on Avery 1005 glossy with the 'heavy smoothing' option selected. Our gamut test indicated a total of around 413,000 colours (which exceeds the approx 402,000 colours when using offset on coated stock). For the uncoated substrate, printed on Lamitech cardstock, the gamut was measured to be 285,000 colours, significantly less than on glossy substrate. But this was expected, as prints on uncoated stock normally produce a less vivid and colourful result.

In the resolution test, which was printed on the same Avery vinyl and with the same resolution settings as the colour gamut chart (but no smoothing), distinct line pairs could be seen at up to 250 dpi in the horizontal direction and at up to 200 dpi in the vertical one. The small text was clearly reproduced down to 4pt, especially the positive text in black on white. The inversed text with white on black background was a bit thin, with the black area swelling into the white text, but still clearly visible.

As a note on the resolution test, the output should ideally have been made with black ink only. Now it was turned into a CMYK print, probably in the RIP, making it a bit more difficult to analyse. But we can see that the droplets are much smaller than the actual lines, so technically the printing system has a higher addressability than the 200 or 250 dpi achieved as the resolving power.

Technical specifications, summary

Vendor	Model	Number of inks	Ink Set	Max. media size	Max. media thickness	Resolution (dpi)	Print speed
EFI	VUTEk GS3250LX	9	CMYK + light cmyk + white	3.3 m	5.08 cm	600 dpi at 24 pL 1000 dpi at 12 pL	223 m^2/h



When measuring all five samples of full tone Cyan across the width of a 70x100 cm poster, the uniformity of the ink density was excellent. We use the threshold of 2.5 ΔE, as suggested in the ISO 12647-2 standard, as when printing solid spot colours. Any colour deviation lower than 1 ΔE is invisible for the human eye to detect. The first sample is compared with itself, so will give a zero colour deviation.

Regarding uniformity the GS3250LX showed a maximum deviation across the page of 0.8 ΔE (and an average 0.5 ΔE), a colour deviation impossible for the human vision to detect.

Conclusions

It's interesting to note the significant enhancements made on this newer printer compared with the one we tested in 2010. Fewer parts and consumables should provide a lower cost to run and service. Coupled with the lower power consumption and high image quality this looks like it will be a true workhorse in many different large format production businesses.

– Paul Lindström

Best of both worlds

Much has been written about the high speed commercial inkjet presses that have appeared in the last five years or so. But there is also a new trend emerging, that involves adding inkjet print modules to conventional press lines, combining the quality and cost-effectiveness of conventional presses with the personalisation associated with digital technologies.

These solutions take advantage of the latest inkjet printheads to offer both high speed and good image quality and are reasonably cost effective. Hybrid solutions have the advantage of using less ink with the cheaper offset inks providing most of the coverage. They also work with a wider range of papers than the inkjet presses, mainly because of the reduced ink coverage, which in turn makes drying the water out of the paper much easier.

The Anton Group

To get a better understanding of how these solutions work we visited the Anton Group, based in Laindon, Essex in the UK. The Anton Group was started in 1968 by John Knight and a partner and its still a family owned business. Originally it was a repro house but grew into printing by acquiring other companies. Eventually they were all brought together under one name and one roof.

At one time Kodak were hoping to sell a Prosper 5000 press to the Anton Group but Gary Knight, press room director, says that the consumables were too expensive, adding: "We will revisit the Prosper press as the consumables get better". However, Knight liked the Prosper technology, which he says is "fantastic, as good as laser."

So instead the Anton Group bought into the S-series print modules and looked for a way to add them to its litho presses. The solution the company adopted is brilliantly simple. The Anton Group uses a selection of Heidelberg Speedmasters, each one fitted with a Heidelberg CutStar, which takes rolls of paper, cuts them to sheets and feeds the sheets to the press. The Kodak heads are mounted on top of the CutStar units and print to the paper before it is sheeted.

The main advantage of using the Prosper print modules is the time saving of printing the personalised elements on press, thereby eliminating the need for an extra step. Knight says that the company has picked up new business on the back of this investment.

Currently, the Anton Group has 18 Prosper print modules but has just ordered another 12 due for the end of July. For the moment the heads are only used in simplex mode, but the additional modules will allow duplex printing on some presses. There are enough modules to allow full coverage across the width of the B1 sheet. The modules themselves are a mixture, chosen to allow the presses to run at their full rated speeds, so that means S5 heads on the Speedmaster 102, which runs at 12,000 sph and S10 heads on the 105, which runs at 17,000 sph.

Kodak Prosper print modules fitted to the top of the CutStar unit on a Speedmaster at the Anton Group.

Knight says that they have been able to print to all the papers they need to, including uncoated, matte coated and glossy stocks. He says that the biggest issue is the lack of data: "I don't think that any database is good enough to be able to give us the information to produce fully variable documents. Knight says that the company would look at using colour in the future but adds: "We would have to look at a different solution like a Prosper when people do have their data sorted out."

Gary Knight, press room director, looking down over the factory floor at the Anton Group.

The Anton Group also has eight Nexpress printers, running 24/7. As a rule, the company likes to build relationships with its suppliers, so it's no accident that the presses are all Heidelberg and the digital all from Kodak. Heidelberg uses the company as a spare parts store, with the advantage that if a press breaks down then there's a good chance that any parts needed will be on site. Kodak, which keeps an engineer on site, is also planning to put in an inkjet print head recovery centre at the Laindon plant.

Other installations

Several other customers have also used the Kodak Prosper modules to create hybrid printing solutions. The German publisher, Axel Springer, has added Kodak S30 heads to two of the six Manroland Colorman web offset newspaper presses at its Ahrensburg plant near Hamburg. The heads were installed as auxiliary equipment in the superstructure of the press, which allows the inkjet system to print on different ribbons depending on the web lead – at a full production speed of up to 914 metres per minute. This is being used to produce lottery tickets. The company has since ordered more print modules to be fitted presses across all of its plants, which are a mixture from Manroland and KBA. In total Axel Springer will have 33 Prosper print modules.

Meanwhile, Thijsen Media Group has installed four of Kodak's S20 heads, on a web offset press at the Emmen plant at the end of 2012, with plans to put four more S20 heads on a second web offset press at its Buren plant in the first half of this year. TMJ has said that this will allow it to produce high speed full colour variable content for advertising leaflets.

Kodak has also had success in China, with Bodena, which specialises in transactional printing in support of online shopping in mainland China, adding 60 S5 heads to its existing Taiyo presses in Shanghai. These are used to produce various documents such as shipping forms.

Finishing lines

Several companies have also added the Kodak heads to finishing lines allowing them to add personalisation to print products at the postpress stage. We've already covered the Lettershop Group in Leeds, in issue 08-10 in March 2011. But essentially, Lettershop built a custom tower as part of a finishing line to house eight S10 heads for a colour duplex solution. The tower includes infrared dryers, which can be switched on for the whole web width, or just to dry a narrow swathe. The heads are mounted on rails so that even though they only print a 106mm swathe, they can be positioned anywhere across the 965mm width of the printed web and can also be easily accessed for maintenance.

The German company Melter Mail Service, based in Mühlacker, near Stuttgart, has done something similar, installing eight S10 colour heads to a web finishing line in 2012. Installed in an Intro tower, they allow variable information to be imprinted in full colour at a maximum speed of 305 mpm. Back in 2011 Melter also installed eight mono S10 heads in a finishing line for preprinted offset sheets.

In another example, Kern, a German company based in Bexbach, Saarland, specialising in direct mail, created a bespoke system based around three S10 heads. This system, the result of a joint engineering venture involving mail table provider Popp Maschinebau, Heidelberg and Kodak, allows variable data to be printed on both sides of colour offset shells. Volume on this system is approaching 15 million A4 equivalent pages per month.

VPrint, a Belgian direct mail printer, has taken eight Kodak S5 heads for use with its finishing lines. The heads can be moved to different positions on the line, giving a

great deal of flexibility in terms of which areas on the page are printed and whether or not colour or duplexing are needed.

Press options

Naturally the press vendors have also unveiled their own solutions. Both Presstek and Ryobi have developed hybrid solutions using the Kodak print modules. Ryobi added S5 imprinting modules to a Ryobi 750 offset press in response to a customer request from Komatsu General Printing Co in Japan. The hybrid press incorporates offset printing, inkjet printing, and an optional inline varnish station in one step. CEO Toshihiko Komatsu says that the press has dramatically improved the company's personalisation capability, paving the way for future growth.

Presstek has also made use of a Kodak Prosper head to offer an inkjet head option for its B2 75 DI press, adding variable data capability. It's a custom order with each press being configured according to customer needs, depending on factors such as how wide an area the inkjet head needs to cover. It's not possible to retrofit existing presses as extra towers are added for the print modules and the drying units, which are the near IR Adphos units that Kodak normally uses.

For now Presstek has used the S5 heads and the solution runs at speeds up to 10,000 sheets per hour, though the press can produce 16000 sph without inkjet printing. It will work with stocks from 0.04 to 0.3mm. It's a mono only solution and is primarily targeted at applications such as adding addresses and targeted marketing information as well as numbering and barcoding.

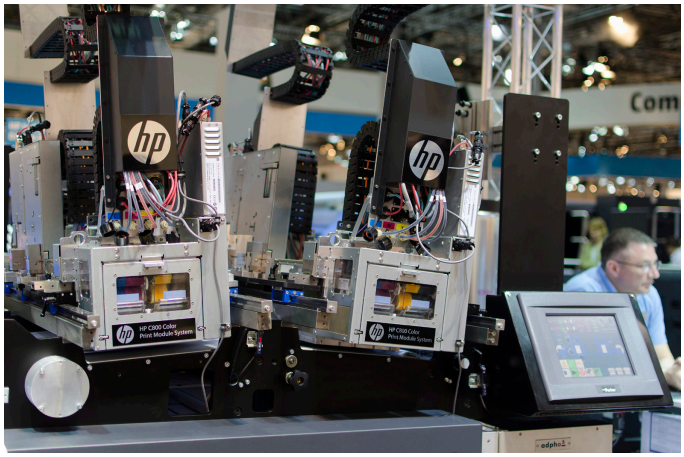
Alternative printheads

Although Kodak's Prosper heads appear to be the most common option for hybrid solutions, there are alternatives. Both Manroland and KBA have partnered with Atlantic Zeiser. Both are monochrome only and use UV-curable rather than water-based ink, which does have the advantage that it will work with a wide range of substrates including plastics. In both cases the resolution is said to be good enough for some variable data text, such as for printing lottery numbers, as well as barcodes and security marks.

Manroland has developed the Inline inkjet module, where the printheads are fixed to a printbar that covers the width of a sheet. It runs at 7000 s/h at 600dpi or 14,000 s/h at 300dpi. KBA makes hybrid versions of both its new Rapida 105 and the 106 sheetfed presses. The hybrid version has an additional tower which houses two Delta 105i inkjet modules, though KBA says that customers can opt to fit up to eight of these inkjet units.

Heidelberg has also dabbled in this area, showing a prototype inkjet option at last year's drupa show, with up to 12 printheads located in a separate print tower.

Last year HP also introduced two new print modules: the C500, which runs at 500 fpm or 152mpm; and the C800, which runs at 800 fpm or 244mpm. They print a 108mm swathe and have a resolution of 600 x 300dpi. Up to five

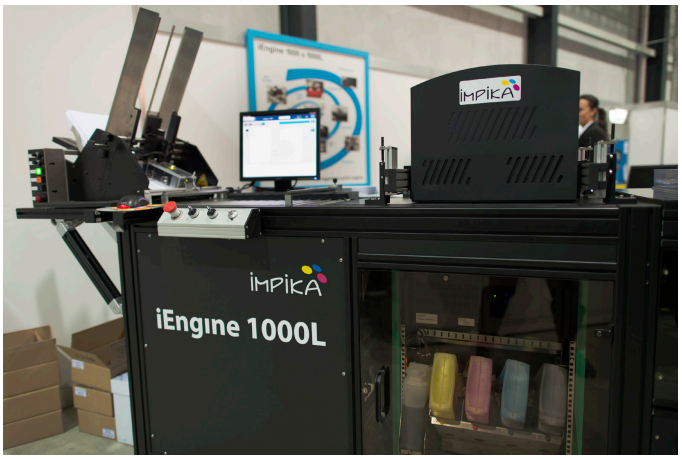


HP C800 imprint modules as demonstrated at drupa 2012.

of these head modules can be stitched together giving a 508mm width. Each module contains four channels but only one of these is used for the mono version, which can thus easily be upgraded to colour.

Impika has also developed its own print modules, the iEngine 1000 and 1000L. These use Kyocera drop on demand piezo heads and work with a variety of inks including water-based dye and pigment, MICR, UV or fluorescent.

The standard iEngine 1000 prints at 108mm wide at 600 x 600 dpi resolution, but with four levels of greyscale, which Impika claim gives it a visual look greater than 1000 dpi.



This picture shows one of Impika's iEngine 1000L modules as fitted to an envelope inserter.

There's a choice of using one, two or four printheads for monochrome, dual colour or CMYK, with an easy upgrade from black to colour. A single mono printhead, or the four-colour version, will run at 75mpm at 600 x 600 dpi resolution, or 150mpm at 300 x 600 dpi; adding more heads takes it up to a maximum of 600mpm at 300 x 600 dpi in monochrome.

The larger 1000L model uses double the number of heads to print a 220mm wide swathe. It has the same resolution and colour speed as the standard version but the fastest monochrome version, with eight printheads, can run up to 800mpm at 300 x 600 dpi resolution.

Clearly, there are a number of solutions available, and although Kodak appears to be the main system of choice now it is inevitable that other vendors will catch up. But the really interesting aspect is that most of these hybrid solutions have been developed by the customers themselves, leaving the press manufacturers to catch up.

– Nessan Cleary

Quiz

There have been many changes in the graphic arts and printing industries since we published the first issue of Spindrift in April 2003. Over the years we have tracked many technologies, industry standards and evolving applications. We can barely remember the details of how the last decade has passed. Can you?

This quiz will give you a chance to answer that question. It is woefully inadequate and ignores some major stuff, such as company takeovers, but it might get you thinking all the harder about where we have been and where we might be headed. There are twenty questions and each correct answer is worth five points for a maximum score of 100. Good luck!

1. Of the following technologies, which one has had the most profound influence on graphic arts production?
a) Direct to plate output.
b) Software as a service.
c) The Windows operating system.
d) The Internet and web-to-print workflow automation.
e) Densitometers.

2. Why was the Digital Printing De-inking Alliance formed?
a) To establish standard inksets for digital printing.
b) To provide bulk buying services for digital printers.
c) To ensure water-based inks perform as expected on press and in recycling processes.
d) To offer manufacturers with a means of sharing recycling technologies.
e) For the alignment of interests of recycling plants and digital press developers.

3. Which screening technology has gained the most ground in the last decade?
a) Tangential
b) Stochastic
c) Elliptical
d) AM
e) Bespoke

4. Dedicated delivery technology for newspapers takes many forms. Name one that actually works as intended.
a) PDF-X/3b
b) XML
c) JDF
d) ADSML
e) SaaS

5. Enfocus Instant PDF started life with Adobe PDF libraries at its heart, which meant it still needed Acrobat to run. When did that change?
a) In 1999 shortly after launch.
b) In 2003 with Instant PDF 2.6.
c) When Adobe introduced Acrobat 8.
d) In 2004 with Instant PDF 3.0.
e) None of the above.

6. Can you name an early competitor (apart from XML) to JDF?
a) Xerox iGen Hub Coordinator
b) Linotype's Closed System Transfer
c) Konica Minolta's Electronic File Interface
d) Lexmark's Interlinked Device Manager
e) Creo's Networked Graphics Production

7. Which of these companies was once big in Computer-to-Plate?
a) Purup
b) Highwater
c) Cymbolic Sciences
d) Esko Graphics
e) All of the above.

8. There used to be many software RIP alternatives to Adobe. Which company has survived in high end applications?
a) Hyphen
b) Global Graphics
c) 3M
d) Avery Dennison
e) Hunkeler

9. Which of the following companies has been, and remains, the newspaper industry's leading partner over the last ten years?
a) Agfa Graphics
b) X-Rite
c) Krause
d) Komori
e) HP

10. Which of the following preflight checking developers has failed to take off?
a) Markzware
b) Enfocus
c) Callas
d) QuickCut
e) OneVision

11. In 2004 the Gates Foundation invested in a Chinese press manufacturer. Which one?
a) Beijing Press Machinery
b) Shanghai Electric
c) Beiren
d) China Print Manufacturing
e) Avalon

12. When did proofing systems start to be about quality assurance?
a) In 2007 with GMG's ColorProof.
b) In 2005 with Fujifilm's RealProof.
c) In 2010 with HP's ProofCheck.
d) In 2003 with Xerox RightPage.
e) In 2011 with X-Rite ColorLine.

13. The newspaper industry has changed over the last few years. Which organisation and show leads it to best effect?
a) All India Newspaper Association
b) PANPA
c) NewsTech
d) Nexpo
e) Wan-Ifra

14. Which digital press manufacturer, besides HP Indigo, was launched at IPEX 1993?
a) Ricoh
b) Screen
c) Fujifilm
d) Nipson
e) Xeikon

15. Which of the following companies has gobbled up the most MIS companies in the last few years?
a) HP
b) EFI
c) Xerox
d) Ricoh
e) Heidelberg

16. Which trade show has consistently delivered the same message and product since 1993?
a) WAN-Ifra
b) drupa
c) IPEX
d) Fespa
e) DScoop

17. Which company has come from nowhere a few years ago to establish itself as a major player in digital print?
a) KBA
b) Xanté
c) Lexmark
d) Ricoh
e) Xerox

18. In 2013 a major player in the graphic arts will emerge from bankruptcy. Who?
a) Goss
b) Kodak
c) Inca
d) GMC
e) Canon Océ

19. What workflow technology was built from the ground up in JDF and positioned as a tool for business management?
a) Fujifilm XMF
b) Screen TrueFlow
c) HP SmartStream
d) Agfa Apogee
e) Kodak Prinergy

20. What is the next frontier for printing?

a) Competing with digital media.
b) Printing in outer space.
c) Printing on any surface.
d) Desktop colour management.
e) There is no frontier because print's at the end of the line.

Answers

1. d
2. c
3. b
4. d
5. d
6. e
7. e
8. b
9. a
10. d
11. c
12. a
13. e
14. e
15. b
16. c
17. d
18. b
19. a
20. c