Digital Dots

Spindrift

Snuggling up to the Graphic Arts industry since April 2003

Volume 12, Number 6 • 8th October, 2014

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

Let the wild rumpus start!
– Maurice Sendak

Dear Reader,

We have been working for much of the summer to get our latest editorial project off the ground. We finally managed it and we're pleased to point you to the Digital Dots Technology Guides for Wild Format Digital Printing **http://digitaldots.org/wild-format**.

Thanks to support from Agfa, Caldera, Durst, EFI, Esko, Fujifilm, Mimaki (and us obviously), this series of technology guides provides entry-level guidance to the wonderful world of wide format digital printing. We've called the series Wild Format, because it is all about helping readers to get the most out of the amazing and untaimed possibilities this technology offers.

The growth in wide format digital printing applications has been astonishing over the last few years. In support of this growth, we have tried to produce objective and independent explanations of the key digital production technologies. We hope that the Wild Format series provides readers with what they need to turn ideas into digitally printed reality, without making expensive mistakes. We hope the articles are helpful for all parts of the graphic arts supply chain, but especially for print buyers and designers.

Over the coming months we will produce more articles roughly organised into five titles. Check out the details on the website and let us know if you're working on anything special in this area.

Enjoy!

Laurel, Nessan, Paul and Todd

In This Issue

By the numbers

Laurel Brunner looks at SpencerMetrics, a new technology from SpencerLabs, that promises to help printers monitor the performance of their presses. It's a comprehensive system that takes into account a huge number of variables to understand the press and the way that it's used and maintained, which should generate enough savings to pay for itself.

see page 13

Slow burn

Ricoh has announced several new printers, including two new toner devices and a web-fed inkjet press, as well as a couple of new software programs. Nessan Cleary has been through the announcements, and assesses what they mean for Ricoh.

see page 19

A dedicated roll-to-roll LF printer

Paul Lindström has tested Agfa's Anapurna M3200i RTR large format printer. This was upgraded earlier this year with the latest Konica Minolta heads and now comes with Agfa's Asanti RIP. It has an impressive colour gamut and delivers on Agfa's promises.

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Regular Features & Special Treats

News Focus

Xerox has launched two new production printers, the C60 and C70, which run at up to 60 and 70ppm respectively (75ppm in monochrome). Resolution is 2400x2400 dpi and they can print on several unusual substrates such as linen. There's a choice of four print servers/controllers from Xerox and EFI as well as a number of inline finishing options, including folding and face trimming. They are aimed at quick print shops, in-plant operations, agencies and small businesses.

Highcon has launched the Euclid II series of digital cutting and creasing machines. These boast a new substrate handling system as well as additional sensors to ensure registration accuracy. The cutting algorithms have been improved for better control over the laser power at faster speeds and Highcon has developed a new polymer formula for accurate creases.

Xeikon has announced a new faster label printer, the Cheetah. It's a five-colour dry toner device with CMYK plus white. It can handle substrate widths up to 330 mm with a true print resolution of 1200x3600 dpi. It includes automatic in-line register and density controls and takes media from 40gsm to 350gsm.

Spindrift ISSN 1741-9859

A very special journal for Graphic Arts, Prepress, Printing & Publishing Professionals, published ten times a year by:

Digital Dots Ltd
The Clock Tower • Southover • Spring Lane
Burwash • East Sussex • TN19 7JB • UK
Tel: (44) (0)1435 883565

Subscriptions:
Spindrift is a digital only publication, distributed in Adobe .pdf format. A ten issue subscription costs €190 and can be obtained by going to **digitaldots.org** and subscribing. Discount multiple subs are also available.

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Xeikon has also launched a new Web varnishing module that can apply UV or aqueous varnish with a flood or spot coating. It runs inline with the Xeikon 3000 Series of presses and there's an optional UV dryer and/or aqueous dryer. The operator can see the results immediately and can make any corrections, without wasting time.

Mimaki has launched a new range of print and cut machines. Actually, the CJV300 are simply the recently launched JV300 solvent printers with the addition of a cutting head. Mimaki has also started shipping its new SS21 silver ink for solvent printers.

EFI has launched a new ceramic printer, the Cretaprint C4 printer, which has a new user interface and advanced nozzle plate cleaning. It also boasts a new vacuum system with higher pressure and a newly designed transport system for better alignment. EFI has also developed a version of its Fiery ProServer digital front end for its Cretaprint systems, which promises consistent colour quality while lowering ink consumption.

Scodix has launched the Ultra Pro digital finishing device. This has a twin-tray media handling system that carries sheets under the fixed array of inkjet UV inkheads in a single pass. There's an independent motion system for each tray and four CCD cameras to provide accurate registration. Scodix has also developed a polymer that produces a spot varnish for short runs, which it calls Scodix Spot.

XMPie has updated most of its software range. PersonalEffect 7.0 includes uCreate, a plug-in for Adobe Indesign that lets designers connect directly with the uProduce server environment from within InDesign. uStore 8.1 gains the ability to monitor customised multi-touch campaigns and to manage approvals.

A report from **RISI** entitled European Containerboard Machine Conversion Study has recommended that European paper producers should consider other products such as containerboard. Ville Henttonen, lead study author and Senior Product Manager of Mill Intelligence at RISI, explains: "Due to its similar basis weights and high volume commodity nature, containerboard has been the most typical conversion product we've seen so far."

Highcon is to use Caldera's POW Packaging Online Workflow as a digital front end for its Euclid digital finishing system. The system has a Web-to-Print element and printers can rebrand it to suit their customers. The RIP element generates a DXF file for the Euclid engine which indicates the cut and crease paths.

Heidelberg has demonstrated the inkjet label press that it previously announced. The Gallus DCS 340 is a hybrid flexo inkjet press with a 340mm print width that uses a Gallus ECS340 chassis with Fujifilm UV inkjet. It uses eight colours – CMYK plus orange, violet, green and white and runs at 50 mpm.

EFI is to offer $300 million worth of convertible senior notes, with an option for a further $45 million of Notes, due in 2019 in a private offering to qualified institutional buyers. EFI plans to use the money raised to pay the cost of certain convertible note hedge transactions and to repurchase up to $10 million of shares of the Company's common stock in privately negotiated transactions, as well as to fund future acquisitions.

EFI has also acquired the Dutch MIS developer DiMS for an undisclosed sum that shouldn't affect its Q3 or full year figures. This will now be integrated with EFI's Fiery digital front ends and EFI has already taken over customer support. The DiMS staff have joined EFI's Productivity Software MIS/ERP group.

Cron, which is China's largest manufacturer of CtP devices, has teamed up with ECRM to form a new company, Cron-ECRM. This will distribute Cron CtP systems and offset printing plates in North America and develop new systems for worldwide distribution.

KBA has agreed some 180 redundancies at its plants in Frankenthal, Germany, in response to falling demand for web offset presses. They will have the opportunity to qualify for a new position for one year at a transitional company from 1 January 2015.

Glunz & Jensen, which acquired a 16.8 percent stake in Othonia Curing Technology, is developing flexo platemaking units that use UV LED curing. The company is also talking with printing press manufacturers to incorporate UV LED technology in the drying modules of offset and flexo presses as well as with digital label presses.

Stratasys has bought GrabCAD, a software company that has developed GrabCAD Workbench, a cloud-based collaboration tool that enables engineers and designers to share, view and manage CAD files and other design data. Stratasys believes this will help accelerate the adoption of its 3D printing solutions.

Tucanna has launched tFlow Approval 2.0, an online job-submission and collaboration system. It can be installed in the local network or in the Cloud, and is accessible via a standard web browser. This now gains a new interface that shows job status in real-time as well as better filtering controls to deal with high volumes of jobs. There's also a hosted SaaS version for easy installation.

The US-based **Rutherford Graphic Products** has developed ExactLoop, a new closed-loop color control solution designed to be used with X-Rite's eXact Scan spectrophotometer. It takes the spectral measurement data from the eXact Scan and makes automatic adjustment to the ink keys on press, leading to predictable, repeatable colour.

X-Rite has entered into a strategic technology partnership with BenQ to enable users to gain direct access to the BenQ display hardware without the intermediary intervention of the computer's graphics card when using an X-Rite i1Display Pro display calibrator and Palette Master. For now it's been demonstrated with a BenQ PG2401PT monitor.

Canon is to supply the Dinax Mirage photo printing software with its ImagePrograf wide format printers. Canon will have two versions, both optimised for its printers: the Mirage Master Edition is for Canon's whole 5, 6, 8 and 12-colour ImagePrograf printers; the Canon Mirage 8 & 12 Color Edition, is just for the 8- and 12-colour printers.

Global Graphics has set up a partner program for companies developing products around its Harlequin RIP. Network members can request copies of the Harlequin RIP for use in their test labs, together with extensive

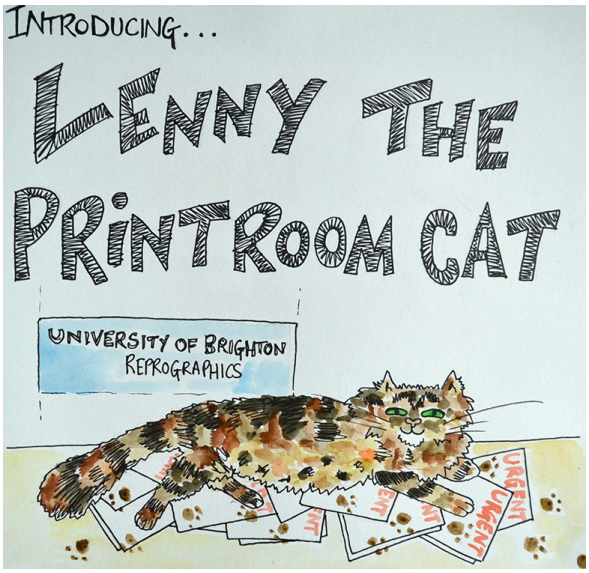
documentation, and will receive alerts about upcoming releases and enhancements so that they can accelerate development of their own products.

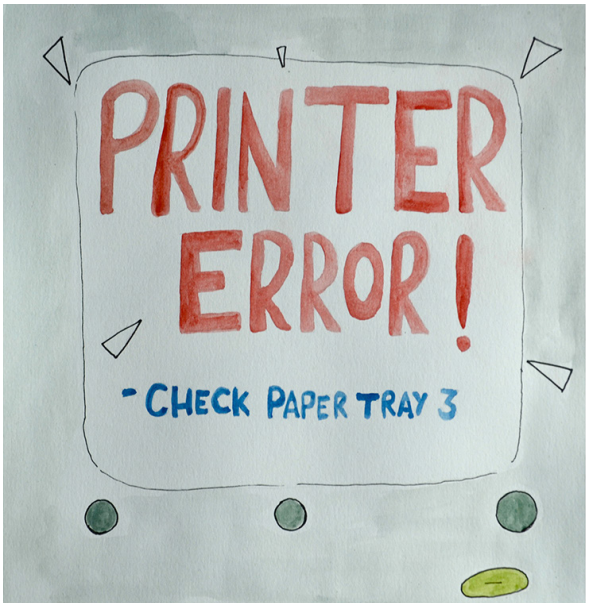
Epson has shown two new photo scanners, the Perfection V850 Pro and Perfection V800 Photo, which take 35mm, medium format and 5x4 inch films. Scanning resolution is 6400 dpi for films and 4800 dpi for prints, with an optical density of 4.0 Dmax.

Woodwing has set up a Services division to offer publishers and brands comprehensive consulting and offshoring production in digital publishing. Essentially the idea is to help customers squeeze more revenue by combining print, online, tablet and mobile publishing.

Hollanders is to cease its standard service contract for the original ColorBooster 230 machines that it launched ten years ago in 2004. Instead it will be offering its existing customers ad hoc maintenance options and trying to persuade them to invest in one of the newer machines.

A report from **Petcore Europe** claims that an amount of PET equivalent to 65 billion plastic bottles was recycled in Europe throughout 2013, making this the most recycled plastic material in Europe. Roberto Bertaggia, chairman of PetCore Europe, said that this means that around 56 percent of all the PET containers in use in Europe were recycled last year.





News Analysis

This last week has seen the Graph Expo show take place in Chicago. There have been a number of new printers announced, which we've mostly covered in the news.

But perhaps the most interesting aspect of the show is the number of partnerships and co-operations between different vendors that have been announced from the show floor.

Thus XMPie has announced that it will build a connector to integrate its UStore, effectively a complete, out-of-the-box, end-to-end workflow solution for receiving, processing and producing orders received online, with Chili Publish, which offers online graphic design and 3D visualisation. Jacob Aizikowitz, President, XMPie, commented: "While Chili Publish has its respectful footprint in the market, we felt that there is a way of integrating it into our architecture that will bring unique synergistic value to current and future customers of both entities."

Hybrid Software has licensed the IC3D Suite of 3D packaging simulation and design applications from Creative Edge Software. Nick de Roeck, Director of Software Development for Hybrid Software, explained: "3D modelling and visualisation have been important in the packaging design process for years, but it took a fresh perspective and a lot of collaboration to integrate 3D directly into the packaging production workflow."

Global Vision has joined the Enfocus Crossroads programme as a Technology Partner and launched the Global Vision BarProof PDF barcode verification module, an off-the-shelf tool that smoothly integrates with the Enfocus Switch workflow automation solution. Global Vision has already committed to producing future configurators for other applications including ArtProof, the first Mac-based artwork inspection solution, to automate artwork inspection for prepress PDF files including booklets.

Goss International has agreed a strategic cooperation with graphic software provider Alwan Color Expertise to provide a turnkey package printing solution for users of the Goss Sunday Vpak press. According to Mike D'Angelo, managing director of Goss International Americas, Goss has recognised a pressing need for colour consistency standards within the packaging sector since entering the market in 2012. He explains: "This is particularly critical when using special ink formulations and substrates that have been specified by brand owners, often with little regard for the technical challenges involved." Thus Goss will now be able to offer on-press colour matching, press calibration, and print proofing and verification, all of which are available for CMYK and extended gamut printing, spot color and HiFi color production.

Ricoh Americas Corporation is to distribute some of the CGS colour management solutions, including Oris Lynx, Oris Press Matcher for Web and Oris Certified for Web. These products and services will be offered through Ricoh's Color Management Program and are available today.

Konica Minolta teamed up with Highcon to demonstrate packaging products printed on the Konica Minolta KM-1 29 inch sheet-fed UV inkjet press and then digitally cut and creased by the Highcon Euclid II+ machine.

Konica Minolta is to sell the IntoPrint Edge 850 and IntoPrint digital finisher, which have been developed by the Canadian company iSys Label and are distributed through IntoPrint Technologies. The Edge 850 digital label printer was developed for the short run, on-demand label market and can print at speeds up to 9.14 m/min. For now the arrangement is limited to North America, but will expand to other regions in the future.

Meanwhile Agfa has continued its association with MGI, having been named as its national distributor in the United States. The Agfa-MGI association began in 2010 with Agfa Switzerland, followed by other Agfa branches across Europe and in Australia. In North America, Agfa Graphics is the only national MGI distributor.

The other big announcement from Graph Expo comes from Ricoh, which we've covered on page 19.

Say What?

This months' Say What is jointly awarded to Ricoh and Screen who claim to have collaborated on developing a new inkjet printer but have completely failed to produce a joint press release, or to mention each other in their respective press releases announcing these machines.

It's worth noting that several publications have been caught out by this, thereby ensuring a number of journalists that are slightly hacked off, hardly a successful PR campaign. So, we can only hope that these vendors' efforts with the printer will prove more successful than their respective press releases.

Exhibit one is Ricoh's press release of 24th September announcing the VC 60000, which tells us:

"Ricoh believes the Pro™ VC60000 will set a new benchmark for quality in its class as a result of its unique multi-drop ink technology."

Naturally, no details as to what any of this technology might be but still, we live in hope that the 'multi-drop ink technology' will turn out to be unique and not just another greyscale printhead.

A day later, Screen announced the TPJ 520HD, which in fairness contains slightly more detail on the press, and was followed up a few days later by a sample book to demonstrate the print quality.

Obviously it would be better if we just wrote about how wonderful these printers are, with a print quality that is certain to see the end of offset and the start of world peace. Far better if we didn't bother our pretty little heads about the technical details, but that's journalists for you.

Green Shoots

Growing Constituencies of Interest, Not Merely Spreading Them

Policies for climate science advancements and reducing greenhouse gas emissions are at the top of the agenda for international agencies and local governing bodies alike. The latest edition of the United Nations Sustainability Report for progress on global corporate sustainability says that all around the world companies are taking a more serious approach to the environment and its protection. The influence of commerce cannot be ignored, so much of this shift is really about protecting corporate bottom lines. But even so, as environmental awareness rises, consumers and business owners are becoming better informed and taking more responsibility.

The latest UN report has the results of a survey to see to what extent companies are putting into practice the ten principles of the UN's Global Compact. Of the 8,000 signatories to this document, 1712 companies from 113 companies responded to the survey. Companies are starting to bring sustainability principles into the heart of their businesses, with training and policies to track environmental performance. Fifty percent have voluntary codes of practice however, only 27 percent get their stakeholders involved. This will change as companies come to realise that if we do not take measures to improve our performance as environmental custodians, then regulators will.

For the printing and publishing industries this is less of a threat than for many sectors, because print is inherently sustainable: it is mostly based on a renewable resource. Consumers it seems have started to reengage with print. According to another survey, seven in ten Americans read a book last year and only four percent just read e-books. The Pew Research survey's goal was to better understand American reading habits and the penetration of e-books and tablet ownership. The results came as quite a surprise, given the plethora of alternative forms of entertainment in the world's largest economy.

Verdigris

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

But if only the US would spend a bit more effort to reduce its carbon emissions. The EDGAR (Emission Database for Global Atmospheric Research) database reckons that at 16.4 tonnes per capita, the country comes second only to Australia which is responsible for a frankly obscene 18.8 tonnes of carbon dioxide per capita per year. China produces more CO_2 emissions than any other country, but at a mere 7.1 tonnes per capita, is far less greedy when it comes to resource consumption and waste. China is introducing some pretty tough environmental regulations, so perhaps environmental accountability is starting to look like an important development metric.

The trick is to get everyone on board. Within the graphic arts we are seeing more companies taking seriously proactive management, although not obviously to improve environmental impact. Among other things supply chain management is a tool for extending a company's or indeed a country's, policies to its suppliers. This makes it handy for improving cost controls and quality assurance management. The concept is also useful for those companies implementing ISO 14001 for environmental management, because it provides a source of new measures for achieving improvements. And, once again it's an example of proactive improvement rather than waiting to be poked with a regulatory stick.

Companies often see standards as expensive and tedious wastes of time. However they should be recognised as tools that help a company improve its procedures. ISO 12647-2 is

becoming a reference for quality control, not just in sheet-fed offset printing for which it was written. ISO 12647-2 provides quality targets and is also a benchmark many digital printers find useful because there is nothing else they and their customers can use.

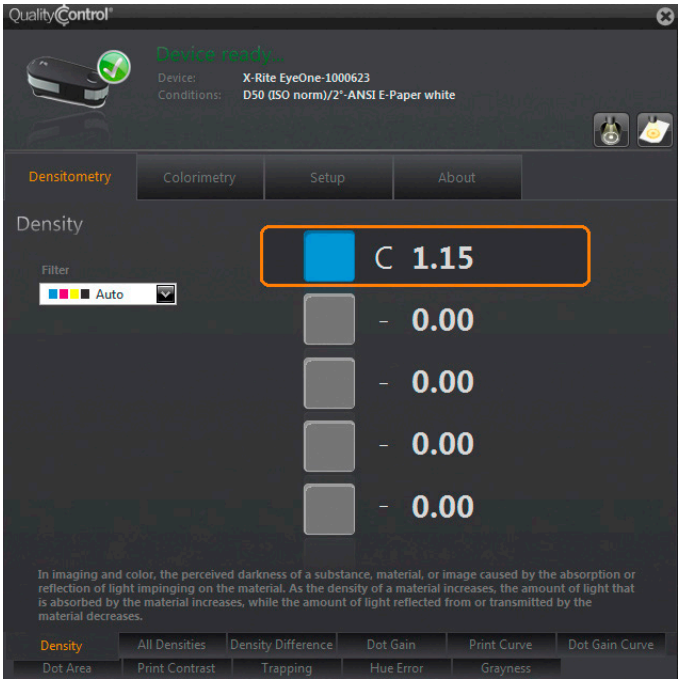
This is in stark contrast to the situation with environmental standards where there are altogether too many, at least in Europe. Consider the resources the European Commission is wasting to develop both its Product Environmental Footprint and Corporate Environmental Footprint documents. These are based on PAS2050 for carbon footprinting products and services, and ISO TS14067 which does pretty much the same thing, but with more elaborate reporting requirements.

Do the civil servants involved not see the irony of duplicating work which amounts to wasted effort? Our environmental conversations need to begin with active cooperation and open communications and a commitment to minimising waste and maximising resource management. This is a new approach to project and resource management and it should be at the heart of the policies and standards that provide our tools for reducing GHG emissions.

A Review

Turn your i1 into a spectrodensitometer!

The software vendor Tucanna was founded in 2006 with its head office in the US and an R&D department based in Verona, Italy. Nowadays the product portfolio consists of both workflow solutions, the tFlow suite of job management tools, and colour control software. But since 2002 Tucanna has also undertaken some programming behind



The Quality Control software from Tucanna turns an X-Rite i1Pro into a spectrodensitometer, and also supports a range of other measuring devices.

the scenes for companies like the Flint Group (printing inks), GMG (proofing solutions) and X-Rite (measuring devices).

Thus we have actually indirectly reviewed a product from Tucanna in 2010, when we tested the X-Rite branded solution PressOptimizer. (We have also reviewed the Tucanna tFlow solution a couple of years ago in Spindrift).

We've come back to Tucanna again because it has updated and re-designed what it calls the Color Control Pro series to support the new range of X-Rite spectrophotometers (among others), which means you can use an i1Pro2 spectrophotometer as a spectro-densitometer, which is quite cool.

It has been a bit of a mystery to us why the i1Pro2 comes with a stand to make spot measurements, when the normal control software for this instrument, the i1Profiler, doesn't support spot measurements. This is a pity, since the older software, ProfileMaker, had this functionality.

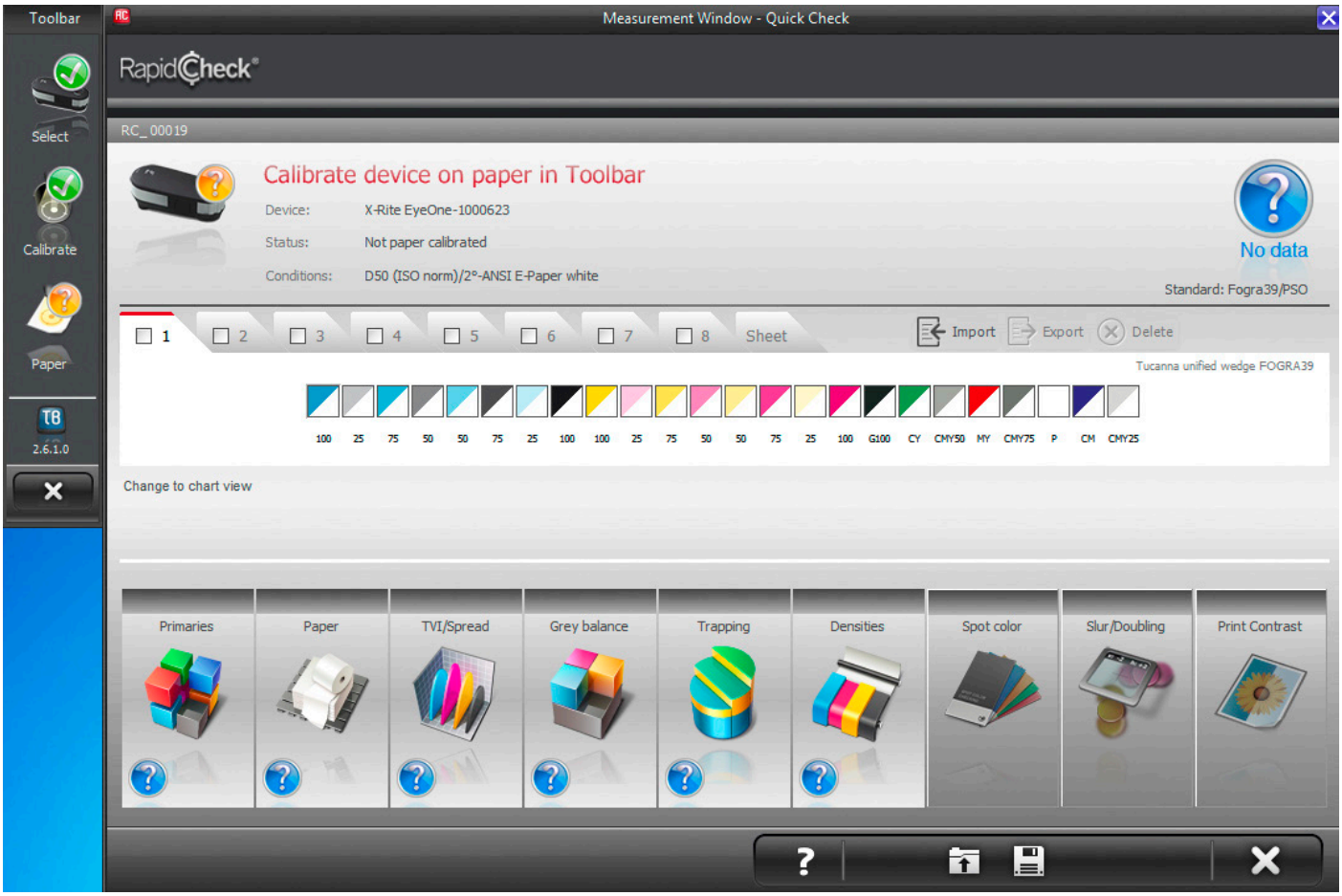
There is other software on the market that extends the functionality of the i1Pro2, for example Spectrashop from RM Imaging, but we found the Tucanna Quality Control and Rapid Check software was especially well suited to straightforward density readings. The ColorControl series also includes the Print Control Pro software, but we won't go into that in this review. It's quite an exhaustive piece of software, and actually competes with, or at least complements, full-blown press control systems.

Quality Control

Starting with the Quality Control software, this has many of the basic functions you would expect when making both density- and colorimetric measurements. It's limited compared to Print Control Pro, mentioned above, but you will still be able to make many common measurements as well as analysis of the print quality. Among the functions are measuring Density differences, Tone value, Dot Gain (or in ISO standards language, TVI, Tone Value Increase), display Dot Gain curves, measure Trapping (printing the secondary colours using C+M, M+Y and C+Y), Hue error, Print Contrast and grey balance. What's also great with this software is its price, only €99!

Rapid Check

Moving over to our favourite, RapidCheck, this is simple to use and yet very versatile software. Using the default setup, it's very easy to quickly evaluate if a printed sheet conforms to a given standard, and set tolerances. The pre-installed references include ISO 12647, but also GRACoL, the common US standard. When checking print you need a control strip in order to have something to measure and so Rapid Check contains many common control strips. If you don't find the one you want, it's quite easy to create a new reference, which includes the patches in the control strip that has actually been used by the printer. This can



The user interface and measuring procedure makes it very easy and straightforward to validate if the printed sheet conforms to a defined standard in Rapid Check.

be a standard control strip as provided by the press manufacturer, provided the control patches are large enough to be read by your spectrophotometer.

One possible draw back from using an X-Rite i1Pro spectrophotometer is that it has quite a large aperture, so needs a patch of at least 10x10mm. Many of the standard control strips used by press manufacturers use very small patches, and to measure those you will need a spectro with a small aperture. The good thing is that Rapid Check supports a range of devices, so this is possible. But the i1Pro needs a fairly large area in order to measure correctly.

Within a certain ISO standard there are different schemes for evaluation. One of the more common ones is the FOGRA/bvdm scheme called PSO (Process Standard Offset). This is the brand name for an implementation of the ISO 12647 standard through a co-operation between FOGRA, the graphics arts research institute and bvdm, the German printing federation. Rapid Check has a PSO compliant reference pre-installed, but it's quite easy to tailor the references to your own preferences.

For example, in the UK the BPIF (British Printing Industries Federation) has introduced an ISO 12647-2 compliant scheme, with slightly different references used than PSO. It took us seconds, rather than minutes, to set up a reference to the BPIF scheme in Rapid Check – a testimony to the ease-of-use in this software.

If there is anything more we could wish for, it would be a function to check the variation between sample sheets from a whole press run, with the OK sheet as the reference. There are functions for trending and statistical analysis which will get you quite far in other respects, but not entirely relevant for this particular type of quality control. But this function is missing in most, if not all,

quality control software we've looked at, including press control systems.

While there are a lot of controls and measurements possible in Rapid Check related to standards, it doesn't end there. We were quite impressed that Rapid Check also supports the use of spectral data saved in the CxF format. This is particularly interesting and important if you work with spot colours, which still aren't included in any published ISO standard. The CxF format (Colour eXchange Format) is developed by X-Rite, but is on its way to become an ISO standard. Credit to Tucanna for having implemented this already in such a reasonably-priced software as RapidCheck. It should be worth the €1790 for many printers, publishers, ad agencies and bigger print buyers to ensure that their prints reach a defined quality standard.

Applied colour management may never be that easy to get your head around, but with software that's as easy to use as Tucanna Rapid Check available, actual print conformance is not that hard or time consuming to check.

We will come back to the 'bigger brother' Print Control Pro at another point, but for now we can recommend testing these two programs, Quality Control and Rapid Check from Tucanna – they might get you a long way to solving your colour measurement needs.

Picture This

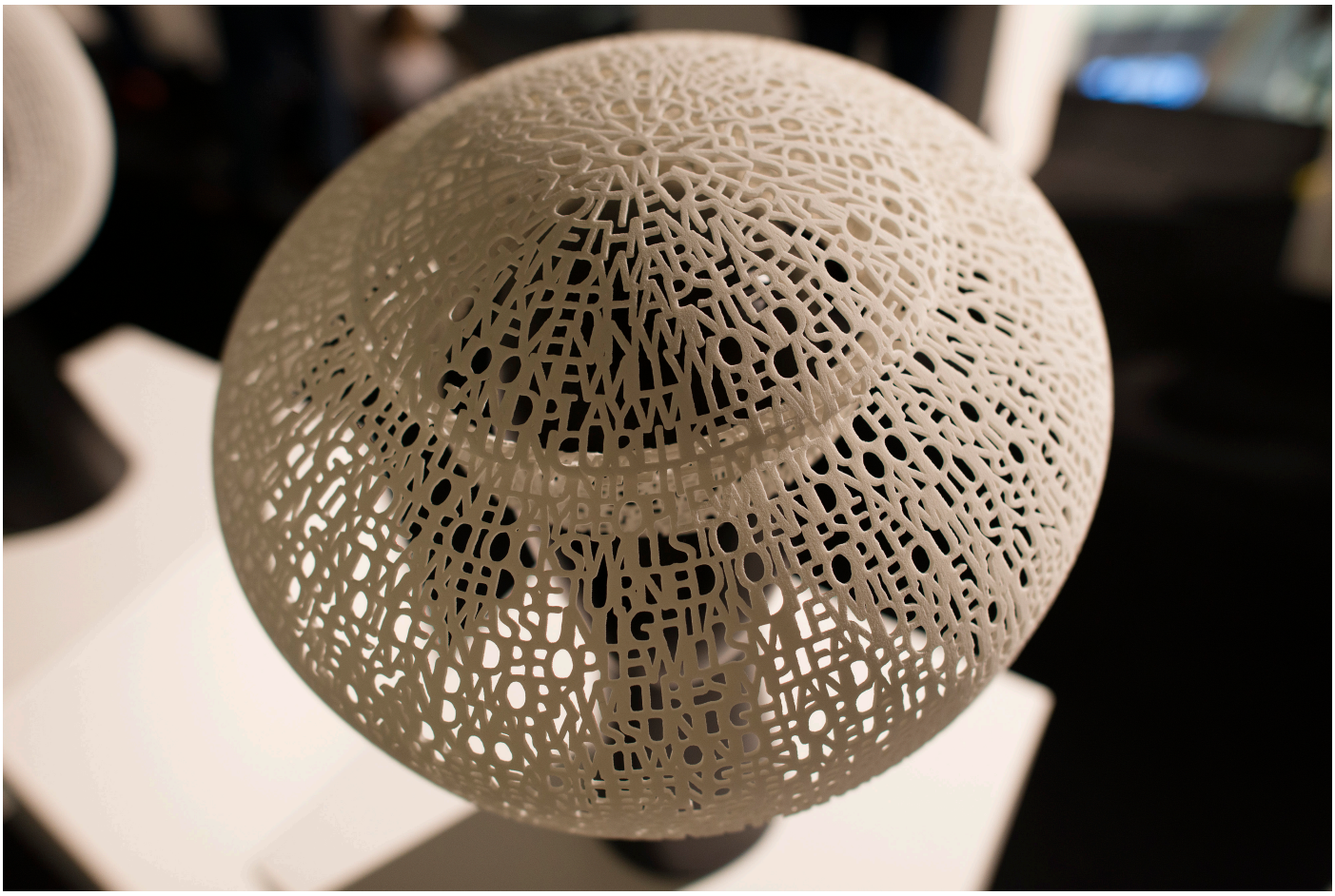
This 3D printed hat was designed by Gabriela Ligenza and shown at the London 3D Printshow, held at the old Billingsgate market last month.

The show had an eclectic mix, from a F1 race car from Strakka right through to food printers, which were mostly decorating with chocolate. There were a lot of small, relatively cheap 3D printers aimed at consumers, and several larger, more expensive models designed for business users.

Most of the printers on show use a plastic filament, usually PLA or ABS, to build up an object in layers. But there were some demonstrated that milled objects to produce the desired shape. Roland released a new printer, the Arm 10, that uses an acrylic type liquid that is then LED UV-cured.

Yet another machine from MCor uses sheets of paper to build up an image layer by layer.

The next 3D Printshow takes place in Paris, 17-18th October, with a New York show scheduled for August next year.



By the numbers

Every year we see new innovations that help businesses to get more out of their existing investments. More often than not, the focus is on the front end or on consumables management. Rarely is the actual press performance monitored. That's all changed with SpencerMetrics, a new technology from SpencerLabs.

This American company has a long pedigree in digital colour imaging for publishing and production. The company's focus has been primarily on benchmark testing and marketing support consultancy for manufacturers. It has focused on research investigating ways to improve print quality and help digital press owners get the most out of their equipment.

Much of this work has been based on qualitative and quantitative product comparisons and evaluation services, as well as testing software and hardware combinations. SpencerMetrics was developed initially to provide a tool that would allow SpencerLabs' consultants "to compare productivity between presses from different manufacturers" on behalf of a client.

Origins

SpencerLabs' founder David Spencer and his team wanted a methodology that would help them to figure out how to monitor and quantify press productivity in a more nuanced way than measuring output or uptime. What they came up with has been developed into a standalone product that provides value to printers by monitoring press performance.

The initial work was to compare a Xerox iGen4's performance with that of an HP Indigo 7000, plus three other digital presses. The testing was done at commercial installations in order to help Xerox to better understand competing technologies in the high-end digital press market. They wanted objective performance metrics on the HP Indigo series and subsequently machines from Ricoh, Canon and Konica Minolta. The testing was done using real live commercial printing installations.

SpencerMetrics Applied

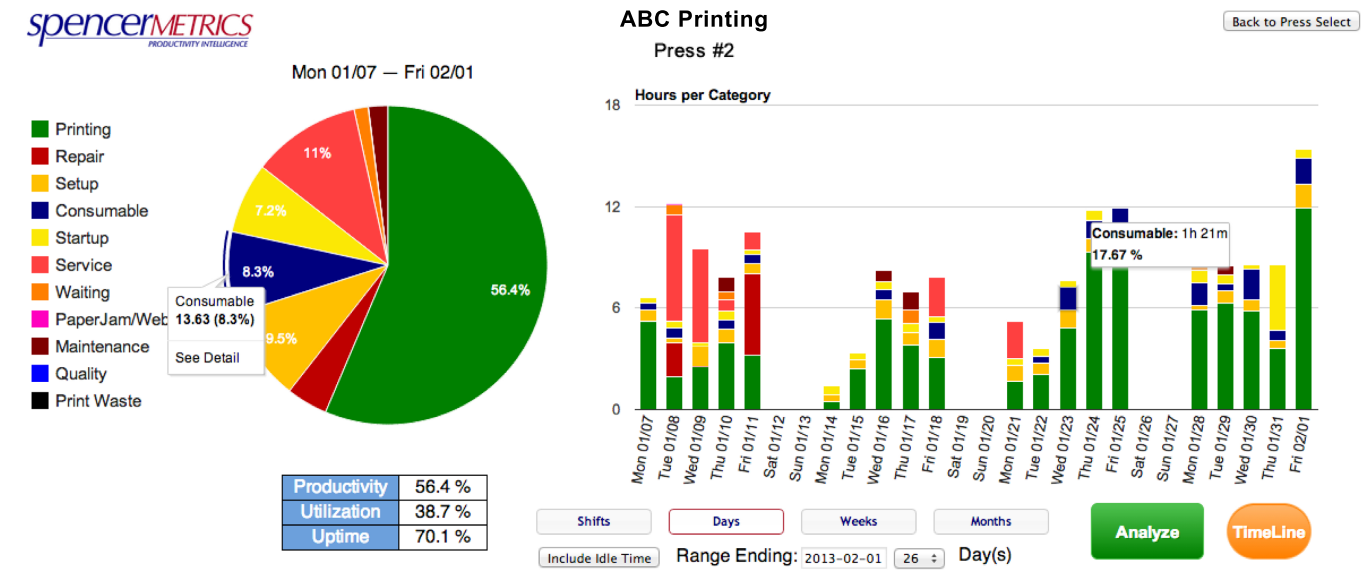
The initial SpencerLabs' metrics covered a range of criteria and were used to identify technological limitations or areas where something looked like it was in need of fixing. For instance, a press that was requiring service for 11 percent of the time was out of commission during service, so it was costing time and money not only for

David R. Spencer, Founder of SpencerLab.

the press owner, but also for the manufacturer in service engineers. The analysis showed that it was only down for maintenance two percent of the time, suggesting that the two may be related.

Another performance metric is the time taken to change consumables. One operator was spending 8.4 percent of his time changing consumables, which seemed high and suggested some internal logistics or training problem. When looking at results, David Spencer explains: "This data, points out where productive press time is wasted. When we look at non-productive time we can see issues".

A couple of printers tested were given the opportunity to revamp their procedures and revisited after a few months. In the example above, the numbers improved: more time was spent on maintenance (five percent); the time taken to change consumables dropped to 4.4 percent; and there



Event	Total Time (Hours)	Occurrences	Average Time (Minutes)
Print	92.68	245	22.7
Repair	6.87	4	103.0
Setup	15.6	243	3.9
Consumable	13.63	25	32.7
Startup	11.8	20	35.4
Service	18.12	8	135.9
Waiting	2.32	6	23.2
Paper Jam or Web Break	0.05	1	3.0
Maintenance	3.25	4	48.8
Quality	0.0	0	0
Print Waste	0.0	0	0
Idle	75.18	93	48.5

SpencerMetrics helps printer to monitor all press activities, including downtime.

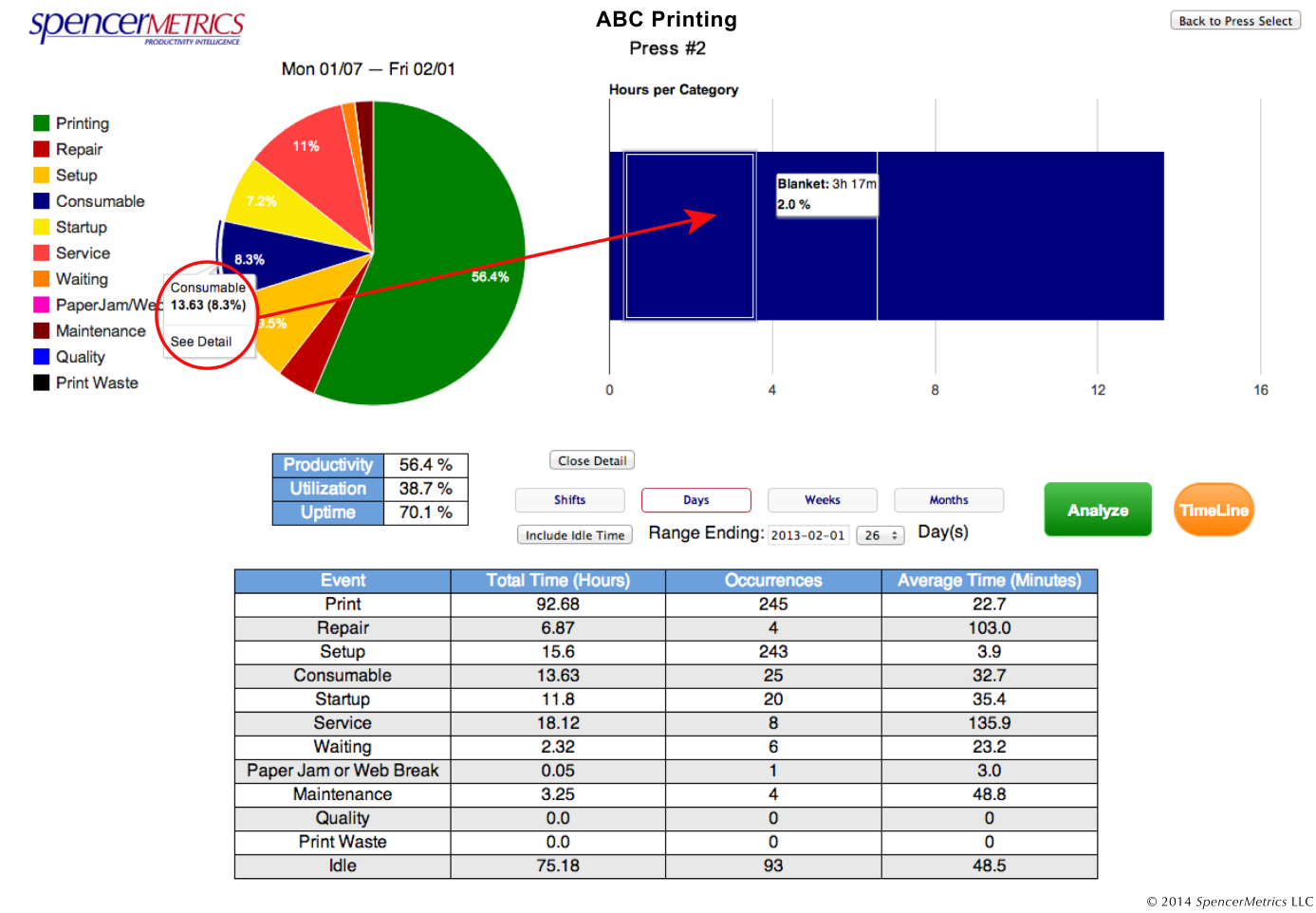
were more frequent in-house repairs and parts changes. The press was also up far longer, with print time rising to 64.1 percent, up from 93 hours to 103 hours (out of the total of about 161 hours the press was not idle).

Another installation saw a productivity gain of eight percent. These improvements required no dramatic process changes however, because the print site managers understood what was happening around the press, they could make small changes that helped them to get a lot more out of their investment. SpencerMetrics allows constant measurement of a range of performance criteria that printers and manufacturers can use to monitor performance over time. Manufacturers can also see how needy a particular site is in terms of its service needs.

How SpencerMetrics Works

Initially SpencerMetrics required the press operator to manually record performance information with a pencil and paper. This information was then transferred to a spreadsheet for analysis, which worked fine for a one-off project but was crying out for automation. So SpencerLabs decided to simplify the implementation of its methodology with more automated data capture, analysis and presentation tools. It created a web application that could be displayed in a browser and accessed anywhere. It also adapted an iPad mini, turning off all of its normal functions, so that it is only a browser dedicated to capturing individual press data and transferring it to the SpencerLabs cloud. Any web browser (computer, tablet, smartphone) can link to the analytics.

Each press has its own URL and a password sign in, so ten presses have ten data capture terminals with individual, automatic sign-ins. This seems a bit expensive, but it eliminates the need for operators handling multiple presses to have to keep signing in and identifying the press they are reporting on.



Event	Total Time (Hours)	Occurrences	Average Time (Minutes)
Print	92.68	245	22.7
Repair	6.87	4	103.0
Setup	15.6	243	3.9
Consumable	13.63	25	32.7
Startup	11.8	20	35.4
Service	18.12	8	135.9
Waiting	2.32	6	23.2
Paper Jam or Web Break	0.05	1	3.0
Maintenance	3.25	4	48.8
Quality	0.0	0	0
Print Waste	0.0	0	0
Idle	75.18	93	48.5

Within each activity category the software presents the details in different formats.

Access is immediate and ubiquitous and is recorded on the SpencerLabs server with the data only stored and analysed in the cloud. Different customers have different needs so there are various customisable presentation options. The SpencerMetrics interface designers have tested their system with Printing Industry of Americas (PIA) and other operators and made sure that the interface is designed for minimal actions on each criteria button.

This makes the system very easy and convenient to use and takes operators very little time to enter data. It took us about 12 minutes to get through the 18 query screens, and that included interruptions to ask questions throughout the demonstration. A press operator with no distractions will take far less time to get through the various categories.

The software measures a variety of factors including: time taken for printing, repair, set-up, consumables, start up (with start plus start and change paper, in case the required paper is not to hand), service, waiting (when a press cannot print because it is warming up after a period of inactivity, RIP'ing a large variable data job, etc), paper jams, print proof, print waste, maintenance, quality, repairs and idle (when the press has no jobs to print, when it is held up because it's waiting for supplies, approval, an operator to come off break or finishing information).

Analysis of these datasets can show where operational workflow weaknesses lie, for instance the frequency and duration of consumable changes or service calls. It allows owners to compare a press's performance over different shifts to measure shift productivity, for instance, with or without idle time. It can also compare time frames and costs per machine, before and after optimising procedures.

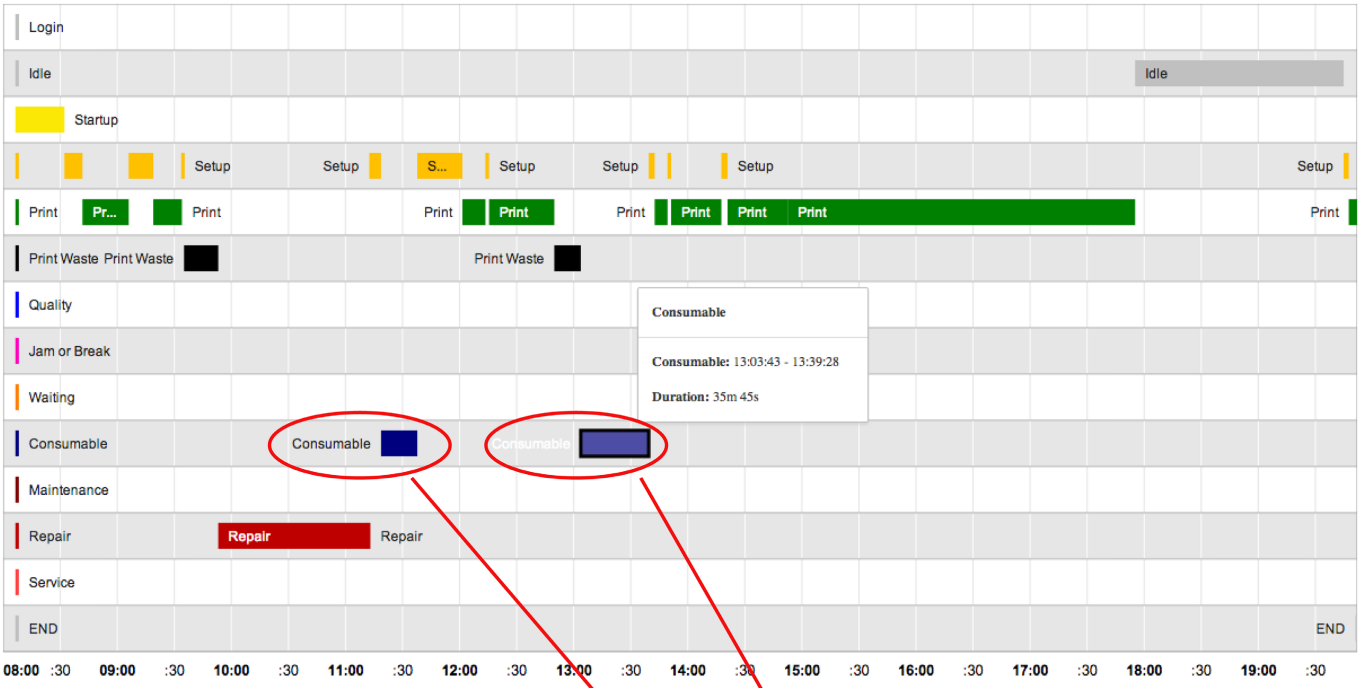
Answering a Simple Question

SpencerMetrics allows a press owner to answer the basic question of whether or not press uptime can be improved

spencerMETRICS
PRODUCTIVITY INTELLIGENCE

ABC Printing
Press #2
Thu 05/23 2013 — Thu 05/23 2013

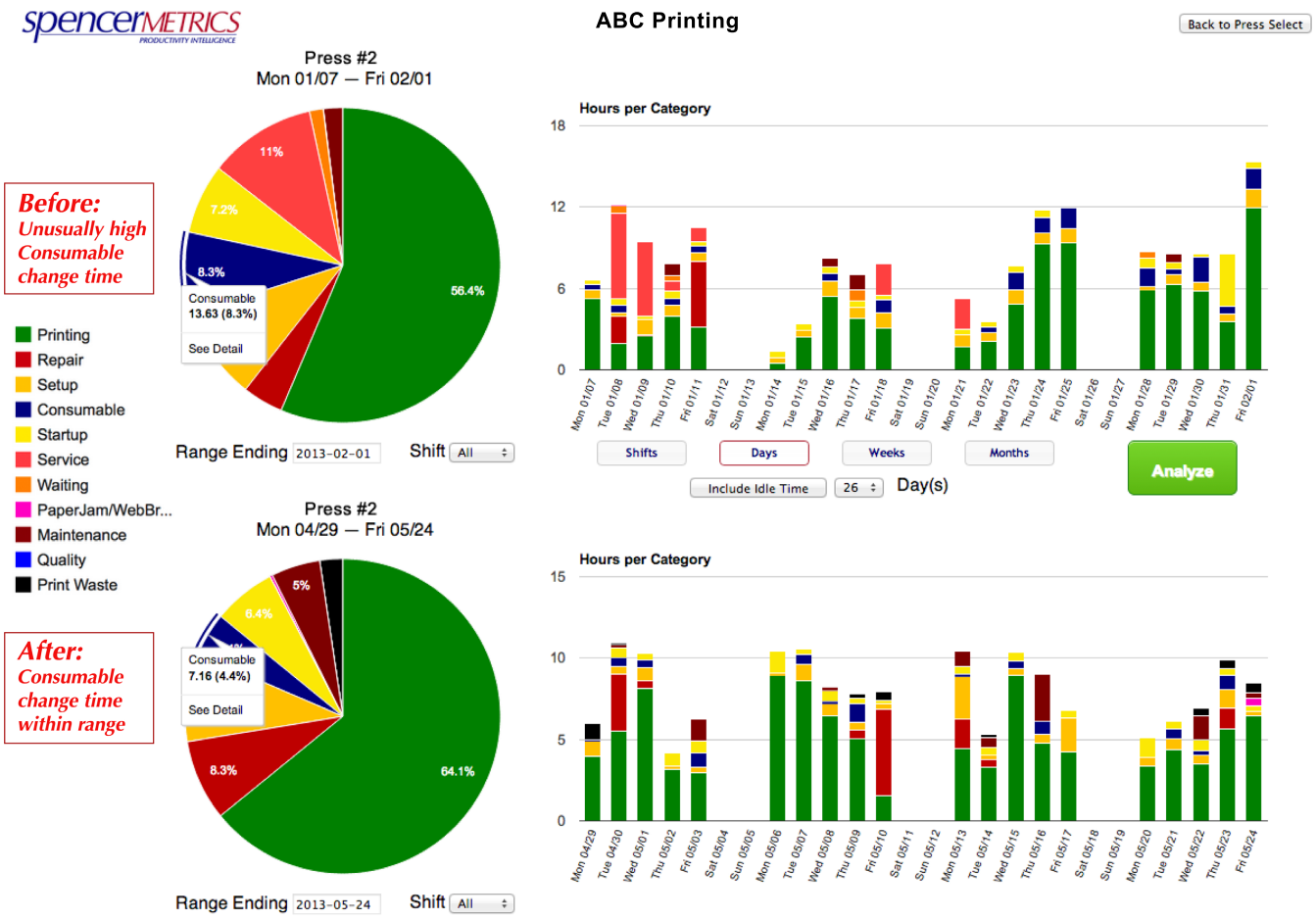
Back to Analysis



End Date 2013-05-23 1 Refresh

Date/Time	Event Code	Subevent	Job No.	Comments
2013-05-23 08:07:20	Login			
2013-05-23 08:07:29	Startup			
2013-05-23 08:32:13	Setup		64809	
2013-05-23 08:41:41	Print	Production		
2013-05-23 09:06:01	Setup		64589	
2013-05-23 09:18:56	Print	Production		
2013-05-23 09:34:00	Setup		64588	
2013-05-23 09:35:06	Print Waste	Press Error		
2013-05-23 09:53:06	Repair	DFE Software		Software error press stoping not feeding paper after the perfector drum shut down and restarted press
2013-05-23 11:11:52	Repair			Downtime 1 hour
2013-05-23 11:12:33	Setup		64588	
2013-05-23 11:18:43	Consumable	Blanket		Changing all parts...blanket smashed
2013-05-23 11:37:47	Setup		64776	
2013-05-23 12:01:28	Print	Production	64776	Print job
2013-05-23 12:13:36	Setup		64588	
2013-05-23 12:15:31	Print	Proof	64588	3rd proof
2013-05-23 12:49:48	Print Waste	Press Error	64589	Print job
2013-05-23 13:03:43	Consumable	Blanket		Blanket smash again
2013-05-23 13:39:28	Setup			64863
2013-05-23 13:42:35	Print	Proof	64863	Proof job
2013-05-23 13:49:21	Setup		64859	
2013-05-23 13:51:13	Print	Proof	64859	Print 4 different proofs

By capturing comments and data, press owners can get to the root cause of problems.



	Indigo 7500 Initial	Indigo 7500 Improvement
Productivity	56.4 %	64.1 %
Utilization	38.7 %	48.7 %
Uptime	70.1 %	72.8 %

The ability to be able to compare data over different time periods and presses is an aid to continuous performance improvements.

to keep the press as productive as possible. Of course, this is possible but achieving it depends on having a starting point. SpencerMetrics is a tool printers can use to provide a starting point based on real performance data. It collects information beyond what one would expect with an MIS and is a complimentary system. An MIS generally picks up information while jobs are running, whereas SpencerMetrics functions independently of the MIS to gather data while jobs are not running as well.

A comment trail on all screens is an additional means of improving performance. For instance, if a machine is waiting the operator can add information about why a machine is waiting, such as for RIP'ing or for the press to warm up. This comment trail can include information that helps to identify cause and effect for downtimes. For manufacturers this is useful as part of remote diagnostics routines for preventative maintenance, or for up-selling services such as colour management training, either to printers or their customers. SpencerMetrics has all sorts of possibilities, as David Spencer says: "This is an industry where referral is important so there's a lot of reasons why manufacturers should like this".

The software is also a means of tracking press behaviour; it generates useful information for manufacturers as well as printing companies. We can see all sorts of benefits from being a handy tool for operators and management, to guiding new feature requirements for developers. SpencerMetrics can provide performance data that explains the reasons for reduced productivity. The software provides insurance with a tangible and valuable record for operators and press owners. This is very handy if they get into a dispute with manufacturers.

Metrics and data that provide productivity intelligence has all sorts of extended applications. SpencerLabs has developed a module called Vantage that can compare data across sites. It includes analyse and compare modes to compare groups of presses with other groups at different locations, or with single machines, or for individual machines within a group. The analysis tools for daily data sets can be compared over different timelines to identify different patterns in behaviours and performance.

SpencerMetrics is available from SpencerLabs or from the company's French distributor DPI4U. Costs start at $295 or €295 per month and the technology can be used for monochrome or colour, sheet or web-fed, toner or inkjet, analogue or digital machines. This is cheap insurance for manufacturers and press owners alike and an ideal tool for getting the most out of press investments.

– Laurel Brunner

Slow burn

Ricoh used the Graph Expo show to announce a number of new printers and software solutions

Ricoh has been slowly consolidating its position as a major supplier to the graphic arts market over the last couple of years. It's won considerable acclaim for its dry toner printers, such as the Pro C901, but is also a major player in the inkjet continous feed market through the InfoPrint business that it acquired from IBM. And as we saw in the last issue, Ricoh makes its own printheads, which has led it to start selling a wide format printer.

The company announced a number of new products at last week's Graph Expo show that should help it extend its reach even further. Chief amongst these is the new Pro C9100 series, which will replace the Pro C901 series. It's

The company announced a number of new products at last week's Graph Expo show that should help it extend its reach even further.

available in two flavours, with a Pro C9100 that can run at 110ppm, plus the much faster Pro C9110 that can reach speeds of 130 A4 ppm. Ricoh claims a maximum monthly volume of up to one million A4 sheets and a duty cycle of 1.75 million A4 sheets.

Ricoh has improved upon its Vertical Cavity Surface Emitting Laser (VCSEL) technology, which can now deliver resolution up to 1200 x 4800 dpi. The printers can reach their full rated speed for all paper weights, in both simplex and duplex and can produce up to 75ppm for A3 sheets, equivalent to 150 ppm A4. Ricoh also claims to have improved its mechanical registration system for sheet-to-sheet and front-to-back registration.

The C9100 series take a maximum standard sheet size of SRA3. They can print onto uncoated, textured and coated media from 52gsm to 400gsm and use a new vacuum feed system. They can also handle duplex banner sheet printing up to 700mm using an air assistance system. They will also print to speciality media such as super-gloss, magnet, metallic, transparent or synthetic.

Ricoh has developed a new media identification unit that scans the paper to work out the glossiness and paper weight and then give its best estimate as to the paper parameters to set up for, handy for those operators that don't know what stock they are using. Ricoh has also added to its media library and now allows users to tweak the different parameters for each substrate, including different ICC profiles for front and back of a sheet.

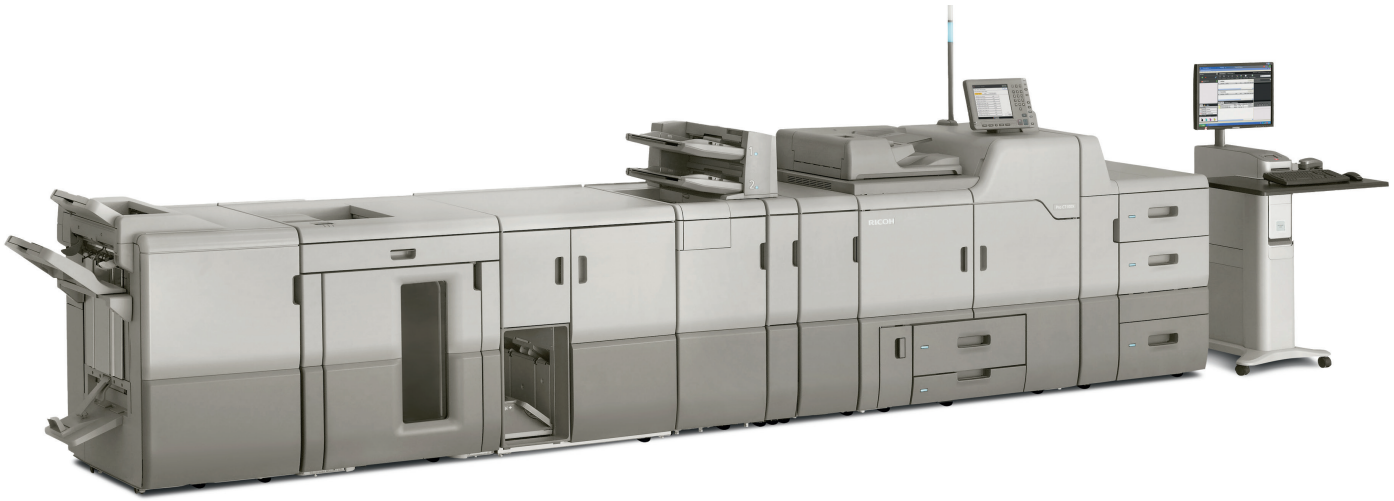
There's a choice of front ends from EFI between the E-43 or the faster and more powerful E-83 print server.

Ricoh has also said that it will support a range of finishing kit, including a Plockmatic booklet maker that's capable of taking 35-50 sheets per book and a new GBC stream punch.

In addition to this, Ricoh has updated its mid-volume range with a new C7100 series. This can produce up to 80 ppm for the C7100 and up to 90ppm for the C7110. They take sheets up to SRA3 size and support media up to 360gsm simplex and duplex, including textured media such as vellum and linen. However, the speed drops with the heavier stock. They boast a maximum monthly volume of 240,000 A4 pages, with a duty cycle of 700,000 sheets.

This series also uses Ricoh's liquid cooling to keep the developer at a constant temperature which prevents the colour drifting over the course of a long print run. Ricoh claims that mechanical registration is accurate to within 0.5 mm. The printer uses an elastic fusing belt to handle the thicker substrates, and there's a fusing belt smoothing roller that helps address fuser burn on the fusing belt.

It uses the same VCSEL imaging system as the C9100 series, with the same 1200 x 4800 dpi resolution. But this series also gain a fifth colour station that will take clear gloss or white toner, which is a nice feature that should give it broad appeal for a wide range of different applications.



The new mid-volume Pro C7100 series features a fifth colour station.

The same front end options are also available, albeit with versions tailored for this series.

Continuous feed inkjet

Ricoh has also been busy on the inkjet front with a new continuous feed production inkjet printer, the VC60000. As with Ricoh's current InfoPrint 5000 series, this has been built by Screen, which will also sell it as the Truepress Jet 520HD. But this new press uses Ricoh greyscale printheads and boasts resolution of up to 1200x1200 dpi. It can print at 50mpm, rising to 120mpm at 600x600 dpi.

It's a 520mm wide printer and can print to a broad range of media that includes uncoated and even heavy coated offset, digital, treated and recycled, which would be a considerable step forward for Ricoh. It would allow the company to talk to a different type of customer, more high end direct mail and book printing rather than mainly transactional printing. There's an optional primer unit that flood coats the sheets before they get to the printer and which allows printing to lower grade papers without loss of quality, though this will only run at the lower 50mpm speed.

The press itself has a modular design. Initially it will be a four-colour machine, but from next year there will be an option to add another unit with two further printhead arrays. These could be used for additional colours or for a clear ink, which could be used to add a protective layer to the prints.

It will ship with a Ricoh DFE - TotalFlow Print Server R600A - that includes native support for PDF, including PDF/VT, and AFP/IPDS together with JDF and advanced colour management support.

It should be available in Europe from January of 2015, although Ricoh has already sold two print lines to the Finnish company Hansaprint, which produces direct marketing and point of sales materials as well as on demand books and manuals.

Ricoh will also continue to supply the current InfoPrint 5000 series of inkjet presses. Indeed, at Graph Expo Ricoh demonstrated a new pigment plus ink for the 5000 MD that's designed to give a very dense black for customers that require this. Mike Herold, director inkjet technologies for continuous feed, said: "We see more and more customers are adopting dedicated mono solutions as growth engines for books, direct mail, transaction and because we see a lot of momentum we will demonstrate this at the show."

Software

Ricoh has also added to its TotalFlow range of software, which works across both the continuous feed and cut sheet products

John Fulena, director of Pro Services and Solutions Marketing Software, explains: "It's the glue that holds the whole portfolio together. It's a rules-based workflow

The Pro VC60000 inkjet press uses Ricoh greyscale printheads.

automation tool that integrates people, devices and software into a single workflow."

Ricoh has announced a new software tool, TotalFlow BatchBuilder, that Fulena says was developed to satisfy customer requests. It is designed to allow print jobs to be batched together in the most efficient manner – "like ganging but with intelligence and automation" – according to Fulena. It will work in any print environment regardless of the hardware so can schedule short-run digital work from multiple sources for centralised job control. Individual jobs can be opened and downloaded as PDF files.

It works by grouping jobs based on client-defined parameters and can take orders from multiple sources, including web-to-print, MIS or manual input thanks to the use of XML mapping capabilities that allow incoming job ticket information to be mapped to internal JDF job ticket fields in order to drive the batching automation. Operators can set warnings for XML inconsistencies, input/output errors, batch errors and mapped network drive errors.

TotalFlow BatchBuilder can be integrated with existing solutions to filter, schedule, view and batch jobs, based on pre-set variables, in a fully-automated or semi-automated way. Prepress or production personnel can quickly and easily review BatchBuilder decisions and adjust as necessary, or design a workflow that goes directly to the print engine's queue for specified job types. It can output JDF compatible tickets allowing it to work with most hardware and software solutions including web-to-print and MIS so that it can function as the production management queue for a web-to-print system. But it also supports hot folders so work can simply be dropped into a folder, automatically adopting the pre-determined ticketing characteristics assigned to that hot folder. In addition to automating the scheduling process, TotalFlow Batchbuilder can optimise paper use and can also be used to manage work across multiple sites for operations with several locations.

Fulena says: "We think it will be an alternative to higher end very expensive solutions in this space. It sits between the business aspects and the production workflow," adding "in the past if you wanted to do that it was expensive and you had a workflow that was a one off and difficult to support."

It is aimed at commercial printers, publishing printers, centralised reprographic departments, franchise printers and service bureaux with as few as two cut sheet devices, or just one continuous feed device, or those with fleets of cut sheet and continuous feed devices, even from multiple vendors. It will even work with wide format printers where work can be grouped by the substrate choice.

The system was demonstrated at Graph Expo, where it won a 'Must see'ems' award, producing batches of bound books, cut-and-stack business cards and folded brochures.

Ricoh has also updated its ProcessDirector and ProcessDirector Express programs, which form the backbone of its workflow offerings. In particular Ricoh has leveraged its investment in Avanti Computer Systems by integrating this MIS into its existing solutions. Thus these can now send production updates directly to print MIS systems via the Avanti Slingshot Connect feature. This in turn means that job status updates related to specific workflow steps, time duration and pages printed can all be updated via Avanti, which should make it easier for customers to manage the business-level processes, such as inventory management, cost accounting and advanced scheduling.

Print jobs can also be archived directly from within the workflow, and jobs can be retrieved by searching on its indexed properties.

Taken together, these announcements represent a much more aggressive push from Ricoh as it seeks to take a larger slice of the digital print market. It's already got a proven success with the current dry toner printers. It's major rival in the inkjet business is its own partner, Screen, though it will hope to be taking on the likes of Canon and Xerox Impika with the VC60000.

– Nessan Cleary

A dedicated roll-to-roll LF printer

Agfa has a long history in large format printing, initially through OEM agreements but nowadays using its own research and design.

The Anapurna M3200i RTR is designed and priced to be an attractive choice for printers that want to move away from solvent-based production to the more environmentally-friendly UV ink-based devices.

The Anapurna M3200 RTR was introduced in 2013 and complements Agfa's range of flatbed large format printers. The latest model is the Anapurna M3200i, introduced early 2014 and built for high volume production, with print capacity of up to 123 m^2/h (Express mode), or 45 m^2/h (High production mode). The image quality is assured thanks to the use of a set of six Konica Minolta i-series inkheads (hence the 'i' added to the name), producing 12 picolitre ink drops at an addressable resolution of up to 720x1440 dpi. The suffix in the name, 3200, stands for the maximum printing width of 3.2 m.

Inks

The inks are made by Agfa and are UV-based and suitable for a wide range of substrates, including fabric, canvas, vinyl, self-adhesive plastic film, polyester and paper. The pigmentation is made to match and actually surpasses that of standard litho offset. Since they are UV-cured they do not contain any VOCs. The ink set-up is CMYK plus light cyan and light magenta to assure smooth rendering of highlight areas. The ink levels are monitored by the automatic ink refill system for easy maintenance.

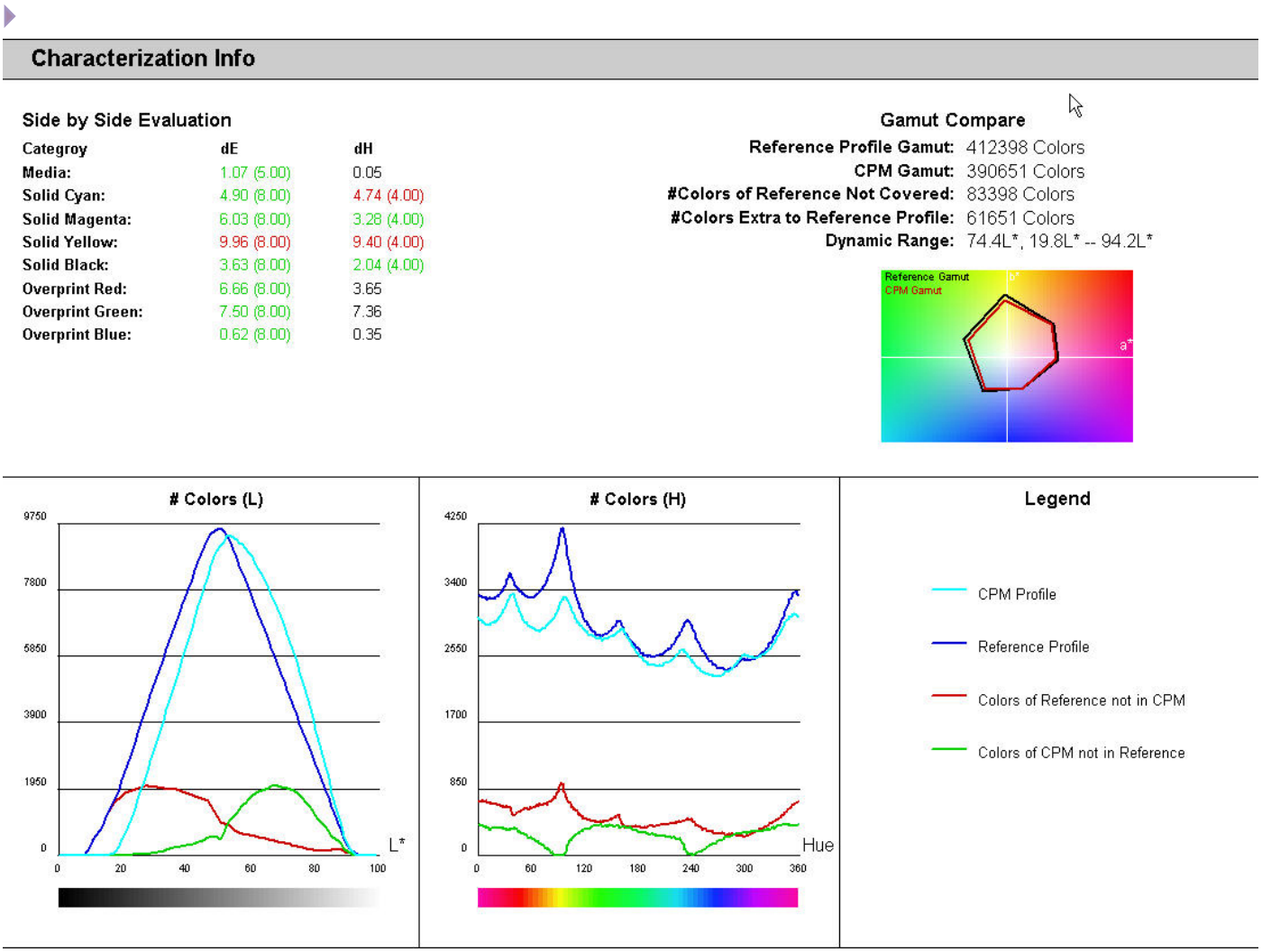
Ergonomics and safety

For heavy rolls, up to 150 kg, the Anapurna M3200i has the option of a special trolley to help the operator and avoid strain or injury. In order to prevent the printheads from touching the substrate there are sensors at the printhead shuttle. This together with the media tension rollers, which keeps the media stretched at all times, will avoid damage to the printheads.

Workflow and user interface

Agfa offers its own workflow solution, Asanti, for the Anapurna M3200i, but also offers integration with third party RIPs, including those from ErgoSoft and Wasatach.

The Anapurna M3200i RTR is a rollfed large format printer for UV-curable ink. It gets its name from the maximum printing width, which is just over 3200 millimetres.



The preferred workflow system for the Anapurna is Agfa's own Asanti RIP. An important module is the Media Hub, where the operator can quickly check if a certain substrate will be compliant to a given standard, for example ISO 12647-2.

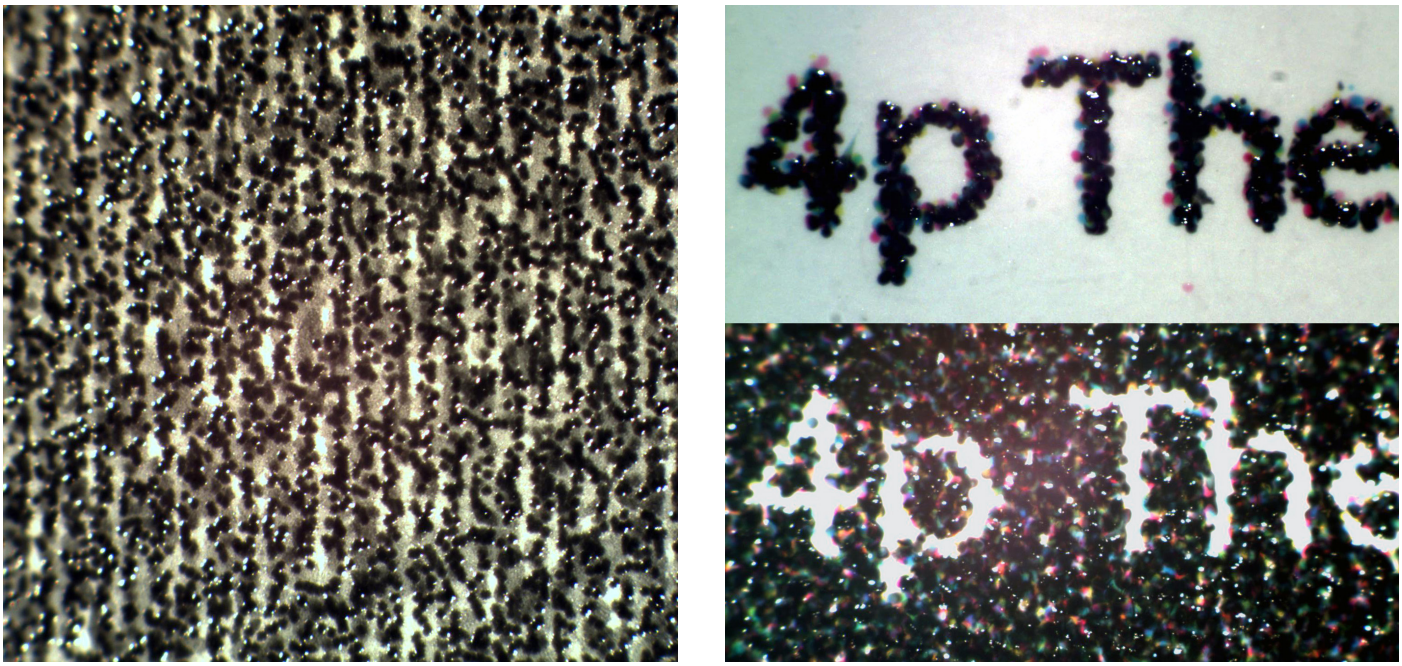
The user interface at the Anapurna itself is through a touch screen, and jobs can be queued and stored on an internal hard disk of 1TB. The Asanti RIP includes a colour management module and connects to what is called the Media Hub. This is a collection of colour pre-sets which links the correct ICC profile and set-up with the chosen type of substrate. This enables a very quick set-up and also helps in general quality management.

Colour gamut and resolution

Agfa very early on decided on matching the pigmentation of the UV inks to the gamut of litho offset. In numbers this means around 400,000 colours, when printing on quality coated paper. The colour gamut of the Anapurna 3200i is actually substantially larger than that of offset; we measured it to be 507 000 colours. This is good, because then you have two options – either apply relevant colour management and match the appearance of standard offset, or use the larger colour gamut for more photorealistic prints.

Customer experience

Printhouse is the in-house printing division for the Danish fashion retailer Bestseller, and installed the new upgraded Anapurna M3200i this summer. Printhouse had a couple of Agfa large format printers already before, like the hybrid Anapurna M2500 and an Anapurna Mw. The company's main work is posters, and the faster throughput of the M3200 was one reason for Printhouse to add this to the fleet. But there were other considerations as Henrik Dencker, Manager at Printhouse, explains: "The six-colour ink set-up, with light cyan and magenta added to the base CMYK, really makes a difference when it comes to smooth rendering of skin tones in particular".



*In the resolution test **(left)**, the Anapurna M3200i RTR showed identifiable line pairs up to the equivalent of 300 dpi, both in the horizontal and vertical direction. Shown here is an image of the sample as seen using a digital microscope at about 500x enlargement. The Anapurna M3200i could reproduce four point text well **(right)**, especially as black on white background, while the inverted white on black is slightly clogged up. Shown here is an image of the sample as seen using a digital microscope at about 500x enlargement.*

And he continues: "With the Anapurna M3200i we can produce proper photorealistic prints, which is, of course, very important in fashion reproductions".

Printhouse used the basic Wasatch RIP for the previously installed printers, but with the M3200i the company has upgraded to the Agfa Asanti RIP. Dencker comments: "The Asanti RIP makes a big difference; it's a proper, professional workflow solution. I can strongly recommend it for any Agfa large format printer!"

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 spacings. The participants print these under optimum conditions onto two types of substrates: one high quality substrate, like coated stock or glossy vinyl; the other onto uncoated paper.

For visual evaluation of general image quality and smooth reproduction of tonal graduations, we also asked for an output of a 70x100 cm poster. This poster is also used to evaluate the uniformity of ink density across the whole width of the substrate. For this 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 a maximum deviation of 2.5 ΔE, the same value suggested in the ISO 12647-2 standard when printing solid spot colours.

We measure colour gamut by creating a standard CMYK ICC profile from the IT-8 characterisation chart data. This is 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 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

Technical Specifications Summary

Vendor/Model	No. of Inks	Inkset	Max. Media Size	Max Media Thickness	Resolution	Print Speed
Agfa Anapurna M3200i RTR	6	CMYK +light c&m	3.2m	0.2 mm	720x1440 dpi at 12 pL	123 m²/h

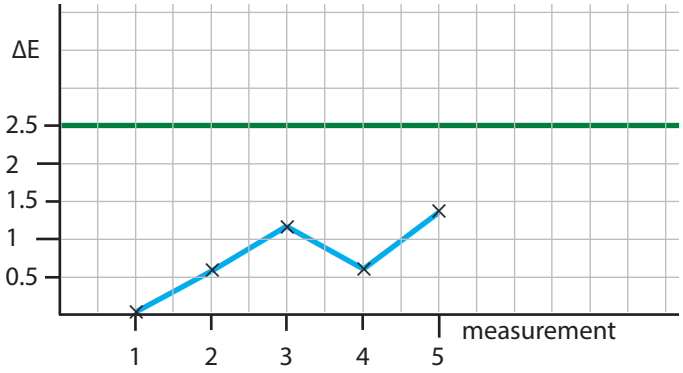
than the stated addressable resolution, as per the technical specification. The resolving power is a combination of the native resolution of the printheads, droplet size and mechanical precision when moving the print heads and/or media while printing. As a complement to the line pair chart we also print text, both positive black on white and inverted white on black, in a small font (down to four points).

Results in numbers

Agfa submitted test samples produced both on a coated stock, the Agfa Synaps QM230, and a paper similar to an uncoated stock, the Spandex Blueback IP 2404. As mentioned, on the Agfa Synaps paper the gamut was substantially larger than that of standard offset, 507,000 colours, while on the Blueback it was slightly lower, 390,000 colours. This is quite normal, since uncoated stock normally doesn't provide enough contrast and ink coverage to reach as large a gamut as on high quality substrates. But thanks to the high opacity of the UV inks the gamut is still quite large on uncoated stock on the Anapurna M3200i.

In the resolution test, which again was printed on the Agfa Synaps QM230 paper, distinct line pairs could be seen at up to 300 dpi, both in the horizontal and vertical direction. This part of the test is very demanding on the printing system. One would expect the resolution to be exactly what is stated as the addressable resolution, in this case 720dpi. But we have found that in reality it's difficult to place the droplets exactly where they should be, so what we call resolving power is always somewhat lower than the stated addressable resolution.

The small text was clearly reproduced down to four point for positive black text on white background, which is according to what Agfa promises in the technical specification for Anapurna M3200i. The negative four point text, inverted white text on black background, was a bit clogged up, but here Agfa actually only guarantee that text down to six point can be clearly reproduced when printed inverted, negative white on black background.



When measuring in all five samples of solid Cyan across the width of a 70x100 cm poster, the uniformity of the ink density was very good, on average 0.8 ΔE. We use a threshold of 2.5 ΔE, as suggested in the ISO 12647-2 standard, when printing solid spot colours. Any colour deviation lower than 1 ΔE is invisible to the human eye. The first sample is compared with itself, so will give a zero colour deviation.

Regarding uniformity, the M3200i showed a maximum deviation across the page of 1.4 ΔE (and an average of 0.8 ΔE), which is very impressive. A colour deviation below ΔE 1 is impossible for the human vision to detect, so the results for the Anapurna M3200i have to be said to be very satisfactory in terms of uniformity.

Conclusions

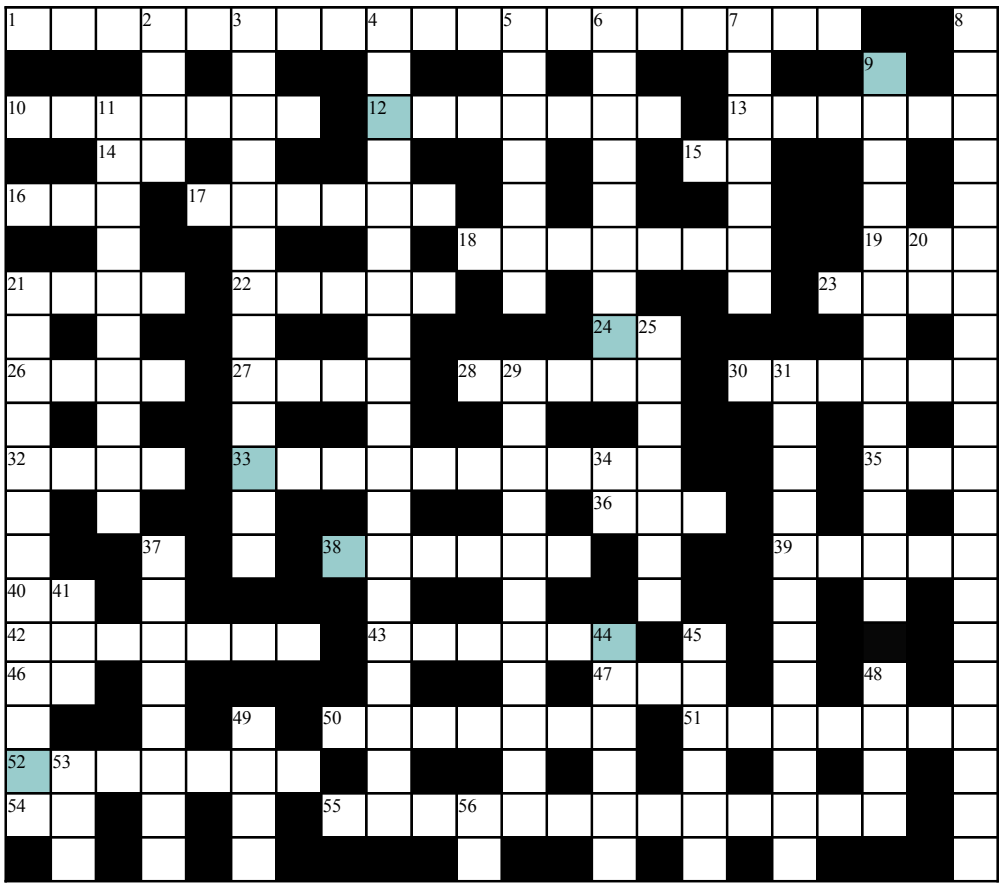
Agfa may very well have found a good combination of features, speed and price with the Anapurna M3200i. The colour gamut and image quality should satisfy customers for a wide array of applications. Using UV-inks the choices of possible substrates to print on will add to the versatility of this printer.

– Paul Lindström

X-word Puzzle

Number 56*

This month's crossword puzzle is very easy, but there are a couple of tricksy clues to keep you on your toes. If you can manage the acrostic as well, you will see what we think of the state of the graphic arts industry these days.



Across

1. Big and beautiful, telling you what you need to know. (5, 6, 8)

10. The spice of life. (7)

12. Persistent even though we try to avoid it. (7)

13. A starting line, the thing that gets lids off tins. (6)

14. Small dash but bigger than a hyphen. (2)

15. Identification. (2)

16. Form of analysis trending at the moment. Mind it. (3)

17. Milk gone off, ideas gone stale. (6)

18. Knocks off track. (7)

19. Luminance, blueness, redness. (3)

21. Route. (4)

22. Not bold, underlined or italicised. (5)

23. A family of dynamic programming languages. (4)

24. Extraterrestrial. (2)

26. To carry. (4)

27. Encircle. (4)

28. Additional private comment, pushed away. (5)

30. Printed or otherwise made visible. (6)

32. Brighly shining gas? (4)

33. Oil repellent. (10)

35. Binary integer. (3)

36. Not he. (3)

38. Added to pulp as a whitening agent. (6)

39. Poster girls of a bygone age. (3-2)

40. Environmental Protection. (2)

42. Not letters. (7)

43. Old Norse monsters that search for patents and Twitter stuff. (6)

46. Doctor. (2)

47. Black and sticky like bitumen. (3)

50. Rubbing out, obliteration. (7)

51. Condemn. (7)

52. Colourant with teensy, weensy particles. (4, 3)

54. Government Issue. (2)

55. Necessary additions to text to aid understanding or entertain. (13)

Down

2. Weight does it, dots do it, bank balances should as well. (4)

3. Functional so trust it to do its job. (3, 3, 7)

4. Booklets, leaflets, flyers are examples of this. (9, 10)

5. Removed. (7)

6. Colours loaded to the gunnels. (9)

7. Step in turning aluminium into a printing plate. (7)

8. For too long the next big thing in digital printing. Time for a change? (8, 4, 8)

9. Repository of information? (9, 4)

11. Hard to earn, easy to squander and what people think of you. (10)

20. Augmented Reality. (2)

21. Waiting for intellectual copyright protection? (6, 7)

25. One who educates. (7)

29. Not CMYK. (4, 7)

31. The process of managing data, people, whatever, to get what you want. (12)

34. Not Islamic and not a state. (2)

37. How we all want to look and feel all the time. Absolutely. (8)

41. Polyurethane glue. (3)

44. Pilots young male cattle. (6)

45. Ghost inclined to follow Hobbits with ill intent. (6)

48. The devil's speciality. Wickednesses. (4)

49. Print standard commonly used in US newspaper printing alongside Gracol and POP. (4)

53. Target. (3)

56. Not down. (2)

Once you've solved the puzzle, write down the coloured letters from the grid in the box below and unscramble to reveal the secret word, which could be the theme for this month's puzzle.

***Answers in the next issue**

Number 55 – Answers

M	E	R	G	E	R	S	A	N	D	A	C	Q	U	I	S	I	T	I	O	N	S
A	■	O	■	■	E	■	■	■	I	■	■	U	■	■	■	■	■	R	O	■	■	C
K	E	Y	■	■	P	A	P	E	R	■	F	I	N	I	S	H	I	N	G	■	■	R
E	■	A	■	■	L	■	■	■	E	■	■	T	■	N	■	■	■	■	■	■	P	I
R	E	L	E	V	A	N	T	■	C	L	O	S	E	D	L	O	O	P	■	E	P	
E	■	T	■	■	C	■	R	O	T	■	V	■	■	I	■	■	B	■	■	■	■	T
A	N	Y	■	D	E	■	Y	■	M	■	E	■	■	G	■	■	S	■	T	■	■	E
D	■	■	S	I	D	E	■	F	A	I	R	Y	G	O	D	M	O	T	H	E	R	
I	T	■	■	M	■	■	I	■	I	■	■	■	R	■	N	■	L	■	R	■	■	
E	■	C	H	E	M	I	C	A	L	S	■	M	A	N	A	G	E	M	E	N	T	
S	■	A	■	■	A	■	E	■	■	■	D	■	M	■	■	■	T	■	E	■	I	
■	T	R	A	N	N	Y	■	■	W	H	E	T	S	■	■	P	E	N	■	■	N	
B	■	T	■	■	■	■	■	E	■	E	■	M	■	■	■	A	■	■	■	A	■	T
U	■	O	■	F	L	E	X	I	B	L	E	P	A	C	K	A	G	I	N	G	■	
F	■	N	■	■	I	■	A	■	O	■	N	■	U	■	A	■	R	■	G	■	■	
F	A	B	L	O	N	■	■	■	F	■	T	■	C	■	■	R	E	E	L	E	D	
S	■	O	■	■	E	■	P	■	F	■	I	■	T	■	P	■	Y	■	E	■	Y	
■	C	A	L	E	N	D	A	R	S	■	A	G	I	L	E	■	I	■	S	H	E	
■	■	R	■	L	■	■	G	■	E	■	■	■	O	■	E	■	N	■	■	■	S	
U	N	D	E	F	I	N	E	D	T	E	C	H	N	O	L	O	G	I	E	S	■	

Acrostic Answer:
PROCESS