

Digital Technology Trends, Pro & Exec Version

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▶ Article on the competing digital printing technologies “Inkjet vs Toner” and manufacturers that will be published in a shorter form in the next NAPL newsletter TechTrends.



Inkjet vs Toner– Digital Printing Battle Lines being drawn

For years experts have been saying that although toner based printing is the dominant form of digital printing today – eventually, it will be inkjet technology. If true then the most recent announcements may be may be signs that the battle lines for these competing technologies are being drawn.

After pioneering toner based printing, [Agfa](#) stopped a few years ago and recently announced sales of a inkjet device.

In contrast, [Kodak](#) another early pioneer of toner printing that left the market, has decided to return to toner and offer high speed inkjet.

After a few years of selling toner based digital printing, [Heidelberg](#) has decided to leave digital printing and return to offset.

While two other pioneers of toner based digital printing [Xeikon](#) and [Xerox](#) continue to sell toner technology.



Agfa

Agfa-Gevaert used to sell digital presses. In the early 1980’s Agfa pioneered the first 400 dpi laser printer with the P400. It was the first laser printer with resolution greater than 300 dpi and was rated at 18 ppm considered extraordinary at that time. The initial funding of Xeikon came from Agfa or AGIF (Agfa Gevaert Investment Fund). In addition Agfa owned part of Xeikon and sold the Xeikon engine as the Chromapress.

In 2001 Agfa sold 25% ownership of Xeikon and discontinued selling their version called the Chromapress. On January 5 2004 Agfa bought Dotrix an inkjet digital press technology from Barco for 6 million Euros. And this month Agfa announced the first installation of this press called the .factory at specialty printer Gardner’s which produces various technical and promotional applications including point of sales materials, signs, labels and outdoor media.

The Dotrix printing system is not sold as a standalone imaging setup but as part of some manufacturing or converting process i.e. label converting or packaging. It uses uv curable inks and has been configured to print on substrates ranging from thin polymer films to aluminum.

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To distinguish Dotrix from the Xeikon product, Jan Van Daele, head of the Agfa imaging solutions business, explained, "The technology is completely different and the end user is completely different. Dotrix is working with more industrial customers, not office and commercial print users."

The .factory incorporates the Single Pass Inkjet Color Engine (SPICE). SPICE uses piezo-ceramic drop-on-demand inkjet technology with inkjet heads from Toshiba TEC, which are based on Xaar's technology. The heads, integrated into the Dotrix's cartridges, are able to produce subtle tints of ink by varying the droplet sizes, thus providing a 300 dpi resolution with three-bit greyscale or eight levels of grey per spot.

These different intensities combined with stochastic screening result in a high level of print quality at a "perceived resolution" of 900 dpi. Capable of printing 907 square meter per hour at widths of up to 63 cm, the .factory is fast. The converting line that will be shown at Drupa will include a jumbo unwinder in front of the press with sheeter or rewinder after it.

In an interview reported on IT-Enquirer.com, Jan Van Daele, Vice President Imaging Solutions at Agfa boldly stated that dry toner printing technology is only considered good enough for lower-quality printing jobs in the commercial printing industry.

According to Van Daele "Dry toner digital printing is good enough for manuals, small batches, short runs and direct mail. But commercial printers know that dry toner technology will never replace the quality they can obtain from their offset printing presses. Inkjet can, because inkjet is based on inks, and inks are what printers know all too well."

According to Van Daele "Can you persuade a printer of the quality of a dry toner system? Does he believe that dry toner can achieve the same results as his offset printing press, which is still an ink-based system? I think not..."

Kodak

Like Agfa, Kodak used to sell digital printers. In the early 1980's Kodak offered a black and white printer that became the Kodak Ektaprint electronic printing system (KEEPS). In the late 1980's Xerox announced the Docutech and Eastman Kodak's Office Imaging group announced a competing device known as the LionHeart. After a few years it became clear that Docutech's were outselling LionHeart's. As Kodak neared completion of their next generation device (9110), Kodak sold the black and white assets to Heidelberg (Heidelberg Digital) and created a joint venture for color devices Heidelberg (Nexpress).

Eastman Kodak Company recently announced that it has agreed to acquire two lines of business from Heidelberg.

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Kodak will purchase Heidelberg's 50% interest in NexPress Solutions which makes digital color printing systems and originally was a 50/50 joint venture of Kodak and Heidelberg. In addition, Kodak will purchase the remaining equity of Heidelberg Digital, a leading maker of digital black-and-white printing systems.

This comes after the announcement earlier this year (January 2004) in which Kodak successfully completed the purchase of Dayton, Ohio-based Scitex Digital Printing, the world's leader in high-speed inkjet printing. Kodak acquired the assets for \$250 million and funded the acquisition through available cash.

The company was renamed Kodak Versamark, Inc. Versamark devices are primarily used for billing, books and direct mail applications the company's core technology is capable of imaging 300 meters per minute.



According to press releases the purchase is part of Kodak's growth strategy to acquire companies and technologies that complements their existing assets.

Through a mixture of selective acquisitions and internal investments, Kodak plans to expand into a range of commercial businesses. The Nexpress purchase combined with the installed base of over 5000 Versamark systems worldwide makes Kodak a digital printing manufacturer – once again. Kodak sold its office imaging and FM business to Danka in 1997 for \$684 million.

Kodak also will acquire NexPress GmbH, Heidelberg's German subsidiary, and certain inventory and assets held by Heidelberg's regional operations, or market centers, as well as offer employment to sales and service employees currently with Heidelberg's market centers.

In an interview by Barb Pellow for the OnDemandJournal.com Jim Langley, President of Commercial Printing and Senior VP said the new "The integration of Versamark is going extremely well and is on schedule. We are pleased with how quickly Versamark has been able to incorporate some of Kodak's image and color science into its products...Versamark will be demonstrated at Drupa in May and illustrate a commitment to improving color quality and workflow to make high-volume digital color printing a reality for a larger segment of the commercial printing and transactional document market... In 3 years Kodak's digital printing business will be a multi-billion dollar business with double digit revenue growth and the most cost-effective digital alternative to offset printing."

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If we categorize the Kodak products into electrophotographic or inkjet, we would have to say that they have products in both categories. If we believe what the experts say about electrophotographic (i.e. toner) and inkjet technologies we would have to conclude that they are poised to take advantage of the toner based printing today and the inkjet printing technologies of tomorrow.

DRIP

On March 9 , 2004 Photogram Technologies Inc., a printing technology development company founded in 1999 and a leading manufacturer of lenticular plastic products announced the availability of its patent-pending Dense Raster Image Processing (DRIP) technology.

The Northrop Grumman Corporation (NGC), a global defense company, is the first print buyer to use the DRIP technology for an advertising campaign. NGC elected to test the technology to produce a paper carrier and a lenticular plastic magazine insert, to be published in the March 15, 2004 issue of Aviation Week magazine.

Paul Richer, Vice-President of Research and Development and developer of the DRIP technology, describes the competitive advantages of Photogram's printing innovation as "Our technology was developed and patented in order to solve many of the problems associated with traditional lithographic offset printing. After more than 3 years of intensive

testing and fine-tuning, we are now able to combine a very high precision color reproduction capability with an extremely high definition detail, which opens the doors to a major quality upgrade for a wide range of printing equipment. Totally noiseless, DRIP can handle subtle color changes, while still maintaining true continuous tone appearance. Even low contrast sharp details are reproduced in their full original nature".

HP Indigo

Unlike all the other digital printing products the Indigo technology is difficult to categorize as either electrophotographic, inkjet or offset. In point of fact the technology is a little like each as well as unlike all others. The imaging technology is electrophotographic like toner but the Electroink technology is not solid like toner but liquid like inkjet. The technology does not image like any inkjet technology, but because it uses liquid ink, many people consider the quality to be more like offset.

Regardless of the exact nature of the technology Indigo continues to upgrade their product lines. On February 10, 2004 HP Indigo announced several new products. The HP Indigo press 5000 offers the same speed and seven-color capability as the HP Indigo 3000, but incorporates multi-tray paper input and a high-capacity paper output.

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It is expected to produce average volumes of 200-800 K color letter pages / month and expected to have a base price of \$395,000. HP also introduced the HP Indigo press 3050. Based on the Series 2 engine, it supports monthly volumes of 150-300 K color letter pages / month. Both machines are targeted to medium-sized and large commercial printers and both will be sold with one year of free service and will be available this summer.

HP also announced the availability of HP Indigo Printing Paper, affordable papers optimized for reliability and quality when used together with HP Indigo commercial presses. The current portfolio of 11 HP Indigo Printing Papers ranges from uncoated text and cover to coated text and cover and will continue to expand.

HP also announced CMYK Plus, which allows graphics professionals to produce output from standard CMYK files (prepared for offset) using color management technology and no manual intervention. CMYK Plus, a part of HP's professional color technologies, enables the production of outstanding output with rich and vibrant colors that are perceptually consistent with traditional offset press in hue and lightness relationships.

Xeikon

While Agfa has switched to inkjet and Kodak will sell both Xeikon, one of the pioneers of toner based technologies, remains a staunch

advocate of the technology. In February 2004, Xeikon announced that their new 5000 can compete with machines from Xerox and HP Indigo on price, speed and substrates. According to Xeikon the 5000, which has been completely redesigned is capable of 130 A4 page per minute (ppm) and will be targeted at digital printers producing more than three million impressions a month.

The machine has a 500mm web width, and can print on stock weights from 40-350gsm. Xeikon says that the charge per impression of the new machine compares favorably against rivals, like the iGen3 with Creo Spire front-end and HP Indigo's WS3200, at 0.02 Euros for 10% sheet coverage and 0.035 Euros for 35% coverage.

Among the improvements to raise image quality to a higher level, is the in-line densitometer, offering perfect front-to-back and color registration as well as color matching without the need for time consuming, manual intervention. New imaging technology was claimed to have eliminated the edge effect that could affect some print on older Xeikon's.

A new front-end called Swift will drive the machine, which Xeikon promises has all the features of its Printstreamer and Intellistream front-ends and is more powerful. The controller can easily handle graphically complex variable data print jobs of more than 1 million records per job.

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The Xeikon 5000 can be equipped with a 5th (duplex) color station to add spot color, special toner for security applications or MICR toner, without impacting its printing speed. Currently the 5000 is in Beta testing.

Xerox

Xerox clearly believes that the future of digital printing is toner. According to Xerox the new Docutech 100/120 represents a \$400 million investment and is the first production product to be brought to market by Xerox in the last 14 years that is based on a brand-new technology platform.

During the last week of January 2004 in the midst of 3 snow storms in New York City Xerox invited the press and analysts to a new product announcements described as “the most momentous announcement in Xerox history”. The presentation took place on a stage at the Hammerstein Ballroom in Manhattan Center, and for good reason because many parts were as entertaining as the Broadway shows offered just a few blocks away.

The “star of the show” was the DocuTech 100 and 120 copier/printer (100 / 120 ppm), a brand-new DocuTech copier/printer line Xerox says was designed from the ground up. According to Xerox this development effort will fuel a whole new family of products built on a common platform that the company believes will result in print speeds greater than anything currently in its product portfolio, although Xerox indicates it has no

plans to use this engine in its continuous feed line of products.

The new DocuTech is the first Xerox black and white device to incorporate technology developed for the iGen3. Among these are techniques for steering paper into and through the machine to help ensure accurate registration. It features patented SmartPress paper handling technology which includes TELER registration (Translating Electronic Registration).



While the machine is impressive because of enhanced quality over previous Docutech's, longer duty cycle, and wider range of paper stocks - the most impressive part of the machine is the integrated, high speed scanner.

It features dual scan heads which enable hardcopy scanning at 120 8.5"x11" pages per minute for both one- and two-sided sheets at 600x600 dpi resolution without flipping the sheet. The scanner is 260% faster than any other 2-sided scanner on the market. At the show, the scanner processed 60 pages in 30 seconds, compared to the existing DocuTechs 3 minutes.

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Summary

Every digital printing technology has clear advantages and challenges. For years electrophotographic based technologies have offered modest speeds, format sizes, and costs but excellent variable capabilities and consistently improving quality. In contrast high speed inkjets have always offered blazing speeds, lower costs per page, but offered limited variable printing options, were very expensive devices and only shown modest improvements in quality.

For years manufacturers of each technology have tried to address their own challenges, but with limited success. The electrophotographic based technologies are still relatively slow when compared to inkjet and offset and typically more expensive per page for longer run lengths. The high speed inkjets while offering slightly more flexible variable printing options and making some modest quality improvements still lag behind these options from the electrophotographic devices.

As a result each technology has created unique niches that address either low cost, moderate quality variable printing or faster turn around, shorter runs for offset printing. The future market acceptance is not dependent on which manufacturer supports which technology but more on the ability of any manufacturer to overcome the issues in each of these technologies.

Print On Demand Patent Infringed, Jury Awards \$15 Million in Damages

A federal jury has awarded On Demand Machine Corp. \$15 million in damages. The jury agreed with the plaintiff's claim that the nation's leading provider of on-demand book printing infringed on its patent for the technology. The defendants, Lightning Source, Ingram Industries and Amazon.com plan to appeal.

The patent in question is Patent No. 5,465,213, issued to Harvey Ross on November 7, 1995, and entitled System and method of manufacturing a single book copy. In 1990 he developed the concept of on-demand book printing. The suit was filed in October 2001 by On Demand Machine Corp., founded by engineer Harvey Ross. Ross passed away in 2002.

Ross' idea was that a customer could enter a bookstore kiosk, key a book title into a computer and access a synopsis, sales and other consumer information before clicking on a command that would produce a printed, bound and covered book within minutes. Reportedly he took his prototype to book expos in New York, but his idea never became a commercial reality.

The Abstract of the Patent reads as follows: "A computer based book manufacturing, distributing and retailing system for the high speed reproduction of a single copy of a book is disclosed.

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The system is especially adapted for direct consumer sales since the manufacture of a selected book can take place at the point of sale. A master module includes a computer having a database of books to be selected, the books preferably being stored in a digital book-description format. Upon selection of a particular book from the database, a single copy of the book (including the text and a color cover) is printed by means of high speed raster printing engines. The system includes a binder for binding the text pages and the cover into a book."

Lightning Source has printed over ten million books on demand since it opened its doors in 1997 as Lightning Print, Inc. The company also produces in excess of 35,000 e-books per month. Lightning Source, while perhaps the largest producer of on demand books, is certainly not the only producer of on demand books.

Other companies effected include R. R. Donnelley who has an on demand book manufacturing operation in Harrisonburg VA, and Quebecor World who operates a facility in Martinsburg, WVA.

The impact on Donnelley maybe greater after the merger with Moore Wallace because the new combined company has \$8 billion in revenues and \$6 billion in market value.

The company has asked the Judge to halt the defendants' on-demand-book-printing operations. A decision on that request is expected within weeks.

Also, the law allows for triple damages in cases of "willful" patent infringement according to the Kansas City Star.

Editorial

This, just boggles my mind. Is it really a value added proposition when only one company can use the word "preflight" or acronym DI? Is it really in the best interests of the industry for a printer to pay a royalty to use stochastic screening technology with waterless printing or if they use a digital printing device to print an on demand book?

None of these expressions or technologies alone creates greater value or makes a company profitable. Not being able to use the same words only confuses an already jargon-overdosed industry and paying royalties to use certain technologies only hurts a already profit challenged industry. Where is common sense?



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