



Digital Technologies in the Offset Printing Industry



Some experts trace the birth of digital printing to 1978, the year the IBM 3800 and Xerox 9700 appeared. In 1993, Indigo and Xeikon gave us digital color presses.

Benny Landa, founder of Indigo, famously declared, early on, “Everything that can go digital, will go digital.” It was a brash statement, given that desktop publishing wasn’t developed until the late 1980s, and the first practical Internet browser was barely known in 1993.

Fast forward to a Heidelberg press conference in the fall of 2011. “Everything that can go online, will go online,” said Bernhard Schreier, chairman of Heidelberger Druckmaschinen. Schreier was surrounded by traditional offset presses, (Speedmaster SM 52 and SM 74) as well as digital equipment (Ricoh Pro C901 and EFI’s VUTEk GS3200 grand-format device).

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- New inkjet presses impact offset and electrophotographic.
- Wide-format innovations and finishing trends.

Conventional offset won’t disappear soon; it’s still a \$40 to \$50 billion market and remains the dominant printing process, but the impact of a stalled US and global economy, structural changes and technical innovations can’t be underestimated.



Katherine O'Brien, Senior Editor, American Printer Division, OutputLinks Communications Group

Today's Offset Environment

Manroland files for bankruptcy protection

According to a Manroland statement, "The decision to file for insolvency was triggered by another dramatic downturn in incoming orders which can be noticed since mid-July and has recently accelerated... Customers are finding it far more difficult to obtain financing in the aftermath of the financial crisis. At the same time, intensive competition, in the face of declining orders, has led to even greater pressure on prices and, therefore, to declining contribution margins. The market size is now only at 50 percent of the level before the beginning of the crisis in 2008."

Interesting Innovations & Installations

New Wide-Format Player

Xante's Memjet-powered, 42-inch Excelagraphix generated some recent buzz. "It prints high-impact, full-color, wide-format pieces on a wide range of substrates, at a price point that's affordable for a fast ROI," reports Tim Greene, a wide-format analyst with InfoTrends. "It's the first commercial solution in the world specifically powered by Memjet wide-format color printing components and technologies."

Excelagraphix targets packaging and signage applications, and is said to be eight times faster than traditional inkjet technology. Output ranges from 8.27" x 8.27" to 42" x 100", allowing it to print over-sized architectural/engineering documents, maps, indoor signage, POP displays, packaging, folding carton, corrugated boxes and newspapers.

Two-sided Contract Proofing & Package Prototyping

GMG combines its color management expertise with a Roland UV LEC 330 inkjet printer and an automatic sheetfeeder on its P3 proofing system. In addition to producing two-sided color contract proofs in registration, the same unit can be used for package prototyping and short production runs on almost any substrate. P3 prints with CMYK, plus white and/or varnish inks, and can print both spot and flood varnishes.

UV Press Offers Novel Embossing & Matte Effects

AccuLink (Greenville, North Carolina) recently purchased a Scodix1200 digital coating press, one of the first in the US. Scodix SENSE technology uses advanced jetting block and multiple inkjet nozzles, which produce UV polymer in small drops and multiple layers, with each nozzle controlled independently.

Users can achieve results similar to traditional embossing, as well as matte-like effects, on both digital and offset output. Because the process is digital, every print can be totally unique.

Delivering variable levels of thickness and texture on single- or double-sided printing, the Scodix1200 has the capacity to produce up to 99 Gloss Units (GU), polymer height up to 70 microns and density capabilities from 1-100 percent.

Choose Your Digital Partner

Other traditional offset players have paired off with digital partners. In March 2011, RR Donnelley and KBA announced an agreement to develop, manufacture and sell next-generation piezoelectric digital inkjet printing solutions to the packaging, securities, commercial and newspaper segments. Donnelley will license its Apollo and other digital imaging technologies to KBA; KBA's new digital press will be introduced at Drupa 2012.

In December 2010, Océ and Manroland announced a global strategic alliance, in which Manroland would market Océ inkjet-based digital printing solutions. (Manroland, the world's third-largest producer of offset presses, has just filed for bankruptcy protection as we go to press — see sidebar.)

"Print is no longer the center of the world," says InfoTrend's Jim Hamilton. "You have to be in a position to support Web, email, social media, QR codes, personalized URLs and call centers, in some cases, for direct marketing and direct mail. Campaign management tools [are important, as are] software and workflow tools."

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The industry has lost more than 25 percent of its establishments since 1998. Recent news isn't much better: An August 2011 NAPL report found commercial printing industry sales fell 0.9 percent in the second quarter. In July, just 24.7 percent of the NAPL Printing Business Panel expected business to improve during the six months ahead, down from 36.1 percent in April, and 39.6 percent in January.

As of November 2009, NAPL found printers of all sizes are most concerned about these structural changes:

- Internet/electronic alternatives to print
- Reduction in order size, page count, etc.
- Postal increases and related issues

Participants also were asked to rate the future importance of their primary product markets. Almost 65 percent of participants with wide-format banners, signage, wraps, etc. as a primary market expected the market to become more important, while none expected it to become less important. Other markets with relatively positive "importance gaps" include promotion, direct mail/marketing and packaging.

Mail Still Delivers Marketing Results

Despite the dire talk swirling around the US Postal Service (USPS), direct mail remains

a powerful marketing tool. According to a recent Wall Street Journal article, the USPS perceives advertising mail as its “rescue plan.” Advertising mail increased three percent, after remaining flat in fiscal 2010, and now accounts for 48 percent of all mail.

Razor thin profit margins, declining print runs and quick turnaround times are pushing printers to achieve unprecedented efficiencies. On the offset side, innovations include computer-assisted registration, closed-loop color control, automatic defect detection and simultaneous plate changes. Drying technology continues to advance: IST’s Compact System eliminates interdeck UV lamps, in favor of a single lamp, installed after the last printing unit, while the single-lamp Komori H-UV offers an economical entre into UV printing.

Inkjet’s Impact on Offset & EP

New inkjet presses that combine speed, quality and variable-data capabilities are poised to challenge both electrophotographic and offset for a piece of the printing pie. Inkjet presses are faster and have a lower running cost when matched against production toner equipment. High-volume producers can opt for inkjet web presses from HP, Pitney Bowes, Océ, InfoPrint, Screen, Kodak and Xerox. These machines are already making an impact on book printing, transaction and direct mail applications.

2011 marked the introduction of Xerox’s CiPress 500 Production Inkjet System. The press leverages Tektronix’s (which Xerox acquired in 2000) waterless phase-change technology and Xerox’s piezo print heads. The twin-engine CiPress prints at 500 feet per minute, or two, 180 full-color pages per minute. Users run can run color jobs on low-cost, plain paper.

Fujifilm’s J Press 720 and the Screen Truepress JetSX are the first B-sized, sheetfed inkjet presses; RISO has offered smaller format devices for some time. Targeting runs of 3,500 sheets, Fujifilm’s half size J Press 720 produces up to two 700 29.5 by 20.8-inch,



INX’s Evolve inkjet label printer with Spartanic inline laser cutting system.

Inkjet Takes Aim at Short-Run Digital Labels

“Label printers producing runs in excess of 100,000 labels per job will likely feel little impact from digital print,” predicts Kevin Karstedt, principal of Karstedt Partners.

“But for those printing runs of 50,000 labels per run or less, a digital printing investment must be evaluated.”

Karstedt, author of “Digital Print: Commercialization Assessment Report,” explains that most inkjet label presses can be categorized as continuous inkjet (CIJ); drop-on-demand (DoD) thermal inkjet; DoD piezoelectric inkjet or thermal transfer.

Thermal inkjet (also known as bubble jet) is commonly found on desktop printers, as well as digital wide-format devices for signage. CIJ and DoD are non-impact processes; the ink is jetted onto the media to be printed. Thermal transfer — typically used for coding and marking applications — requires media contact.

From Tabletop to Tank-Sized Machines

Digital label presses can be broadly categorized as desktop devices, or heavy-duty production machines. Vendors such as Allen Datagraph, Primera and QuickLabels serve the former market, with niche offerings ranging from \$20,000 to \$30,000. Production systems, typically, are priced from \$275,000 to more than \$1 million, depending on the configuration.

HP can claim worldwide digital label production press bragging rights, with an estimated 1,300 installations, followed

by EFI’s Jetrion (approximately 150) and Xeikon (approximately 75).

Now Trending: Inline Laser Finishing

Ink vendor INX Digital recently teamed with Spartanic to showcase a narrow Web press with an inline laser cutting system. Said to print

up to 80 feet per minute on any label stock, the NW140 UV uses 14 Xaar 1001 printheads and has a water-cooled UV LED-curing system.

Attendees at Labelexpo Europe 2011 saw something of a shift in press design with the debut of EFI’s Jetrion 4900, a UV inkjet digital press with inline laser finishing.

Karstedt says the Jetrion 4900’s modular design shows investment preservation promise:

“If a new head arrangement came along, you could just bolt it on or add something, such as cold embossing capabilities. It’s almost like a press chassis [you can build on] for 20 years.”

Consolidated Products (Knoxville, Tennessee) installed the first Jetrion 4900. Only one setup is required — even for a million-label job, with 25 different SKUs.

Inline Color Labels

Memjet’s printhead, controller chips and software support printing process color in a single pass (700 million drops per second) across the width of a sheet. Working with OEMs, Memjet’s technology focus is on small-format label devices, also targeting home and office, wide format and photo retail applications.

When configured with up to five printheads, Memjet’s 8.77-inch wide printhead can achieve 1,600 DPI native print resolution, in both CMYK and a spot color. It reportedly supports label production, at speeds of up to 32 inches per second. A standard 8-inch diameter roll can be printed in less than nine minutes.

Similar to the consumables on a desktop printer, Memjet users replace cartridges. “Memjet is changing the business model,” Karstedt explains. “When you replace the cartridge, you’re also replacing the inkjet head.”

Wide Format Widens Commercial Printers' World

Creating New Opportunities

Aurora, Illinois-based Kelmescott Communications traces its roots to 1936, when it was founded as Kelmescott Press, with a single sheetfed machine. The new name was adapted in 2008, to reflect its commitment to providing full marketing communications solutions.

Kelmescott's latest addition to its wide-format department is a Screen Truepress Jet2500UV grand-format inkjet printer. Applications include tradeshow signage, window graphics, promotional products, banners and boards.

"The Truepress Jet2500UV [allows us to] adjust the output resolution, up to 1,500 x 1,500 DPI, and the UV finish makes the images appear more vibrant," reports Charles Randazzo, director of sales and marketing. "This machine is creating new opportunities for us, especially within our existing client base. When you look at its capabilities — the 98.4-inch width, 1.9-inch substrate thickness, flexible and rigid media handling and 1,500 DPI resolution — there is virtually no limit to the size and scope of work we can bid on."

Offset & Digital Diversification

Quad Express Printing (Hayward, California) is the first US customer to purchase an EFI VUTEK GS3250 grand-format inkjet printer from Heidelberg USA.

"We are hopeful that the new VUTEK machine will bring in additional offset work, by promoting enhanced quality, rapid turnaround and tighter alignment with our customers," says J.B. Garcia, vice president. "[It] diversifies our offset and digital wide-format print capabilities, opening up a wealth of possibilities."

Offset-like Quality

McCoy Printing (Torrington, Connecticut) has installed an Inca Onset S40 wide-format UV inkjet printer. "A good portion of our clients do fashion work where flesh tones are critical along with color and gloss," says Andy Riberdy, president. "We're producing near-offset quality on the S40, and our customers have been very impressed."

In the US, the Inca Onset S40 is sold exclusively through the Graphic Systems Division of FUJIFILM North America Corp.

four-up size sheets per hour, or the equivalent of 10,800 8.5-by 11-inch pages per hour.

Toner and inkjet machines eliminate make ready processes and costs, an advantage versus offset devices. Inkjet machines have some substrate limitations, particularly on coated stock, but more options are being developed. Inkjet's scalability offers intriguing platform possibilities; for example, five print heads in each print bar span the HP T200's 22-inch web, while seven print heads span the 30-inch web of the HP T300/T350 and 10 print heads span the 42-inch HP T400.

Offset ink is considerably cheaper than inkjet inks. Offset machines, typically, also achieve higher uptimes than do digital presses. "Digital press operations are plagued with downtime, no matter what the process, make or manufacturer," grumbles one user. "We have dazzling color, yes, but we still have the copier repair technician."

The bottom line: "There is no question that digital output will replace more and more offset output," says Gartner's Pete Basiliere. "But the question is not 'Will one technology replace the other?' but 'What is the best technology for a particular job?'"

Katherine O'Brien is the senior editor of OutputLinks' American Printer Division. She has covered business-to-business issues for two decades.

kob@outputlinkscg.com.

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