

Deciphering the DI Market

by Eliot Harper

TEN YEARS AGO, the printing industry witnessed a new and revolutionary concept to lithographic plate-making—the ability to image lithographic plates on-press. In 1991, Heidelberg introduced the GTO-DI. This press used a rather crude spark-discharge technology to image plates, which resulted in limited image quality; however, the concept was unique and this direct imaging (DI) innovation heralded the beginning of a new age of presses.

In 1993, Heidelberg replaced the imaging system of the GTO-DI with a laser head, which improved the quality capability of the press. Two years later, at Drupa '95, Heidelberg launched the Quickmaster DI 46-4. This two-up, four-color press proved to be extremely popular. Today, the popularity of this press continues, as over 1300 Quickmaster DI presses have been installed worldwide.

However, the DI success story does not stop at Heidelberg. With the growing demand for faster job turnarounds, and increasing use of digital workflows, a handful of vendors have jumped on the DI bandwagon of opportunity. Today, there are nine DI presses available, with seven more under development. In an attempt to decipher the many different offerings in this market, this article analyzes all DI press vendors and imaging systems.

Press Vendors

Adast

This Czech sheetfed offset press vendor has two DI presses; the 500 and 700 series. The 500 series is available in four or five color units; the four-color version of this series is named '547 DI', and the five-color is named '557 DI'. These waterless offset presses use Presstek's polyester plates which are stored in the internal plate cylinder design. Adast claims a 10 minute makeready, including imaging, plate and paper loading, plate cleaning, ink key profiling, registration and color balance. Adast have an OEM agreement with Xerox, where its 507 series is sold as the DocuColor 400 DI-4/5. Currently, the 507 series is only available as a conventional press from Adast, as Xerox have a semi-exclusive sales agreement for this DI press.



Adast 755C DI

The 700 series is also available in four or five color units; the four-color version is named '745C DI' and the five-color is named '755C DI'. These presses have been available for several years, and until recently, the 755C DI the only five-color DI press on the market. The presses use Presstek's aluminum waterless plates along with the Pearl imaging system (which is also used on the Heidelberg QuickMaster DI 46-4). However, other plate brands can be made offline and may also be used on the press. This imaging system is substantially slower than Presstek's ProFire system used on the 500 series—12.74 minutes to image a plate at 2540 dpi, compared with 5.20 minutes by the ProFire system. Currently, there are no plans to upgrade the imaging system on the 700 series.

Akiyama

In September 1999, Akiyama announced that they would be jointly developing a DI version of their J Print press with Presstek. Akiyama's J Print is a compact, one-pass sheetfed press which prints on both sides of a sheet simultaneously. The DI version of the press; the J Print DI, will be offered with four, five, or six color units, and the initial target market for the press will be book printing. An availability date has yet to be announced.

Didde

At Drupa 2000, Presstek announced an alliance with Didde to create the first DI UV web press. The DI unit is also intended to be a field upgrade to Didde's current press lines. The press will have a hybrid capability to print by offset and digital printing. Although no other details have been announced on this press, it is understood that the target market of this press is direct-mail printing.



Heidelberg Speedmaster 74 DI

Heidelberg

Heidelberg is the oldest player in the DI market and hold the largest market saturation. The Quickmaster DI 46-4 launched at Drupa '95 currently has an install base of more than 400 in North America, and 1300 worldwide. The presses common-impression-cylinder design has proved to be very popular in the two-up market.

Heidelberg recently started shipping its new four-up direct-imaging offset press, the Speedmaster DI 74. Automatic plate-loading takes about five minutes, and any processless thermal plate can be used; however, Heidelberg's Saphira plate is the preferred plate for this press. Saphira is supplied by Agfa on an OEM basis; this is the Agfa Thermolite plate. As an alternative to on-press imaging, other plate brands can be made offline and may also be used on the press.

Karat Digital Press

After several years of development and beta testing, Karat Digital Press (a Scitex and KBA joint venture) have announced that their 74 Karat press is close to becoming commercially available. The 74 Karat is a waterless offset press based on a common impression cylinder design and uses Presstek's PearlDry plates. The plate imaging technology is from CreoScitex; it uses 830nm laser diodes in a matrix array formation, in one imaging head. The press has two imaging heads, each head images two plates (as each plate cylinder holds two plates).

The press requires no manual ink key adjustment. The press has no ink keys, although the operator can adjust the ink temperature to control the overall ink density. Karat claims a total setup time, measured from the end of one job to color-OK on the next job, of 18 minutes. Most of the setup is automated and the press has a top speed of 10,000 four-up impressions per hour.

Komori

At Drupa 2000, Komori demonstrated their Project D DI press. With a 40-inch width, the press will offer considerable competition to Heidelberg's Speedmaster 74 DI press. At the Drupa demonstration, the press used an ordinary Lithrone chassis fitted with CreoScitex thermal imaging heads. The

press was running Agfa Thermolite and Kodak No-Process Thermal plates. Plate imaging time was impressive; all plates are exposed simultaneously in four minutes. An availability date for this press has yet to be announced.

MAN Roland

At Drupa 2000, MAN Roland demonstrated their DICOweb DI press. Aimed at print runs from 500 to 30,000 copies, this four color, eight-up press uses CreoScitex SquareSpot thermal technology. The press has built-in perfecting, with each unit printing on both sides of the sheet at the same time.



MAN Roland DICOweb

The plate imaging process is divided into several different stages. First, data are thermally transferred onto a form cylinder incorporating a thermo-transfer ribbon. The transfer material is then heated to set the images. Next, the cylinder is conditioned for water acceptance, and the press is ready to print. After the print run is finished, the ink and thermo-transfer material are removed with a cleaning fleece and remover liquid. The cylinder then is ready for a new imaging cycle. MAN Roland claims changeovers from last sheet of one job to first sheet of the next job take about 10 minutes. Cut-off lengths can be varied by changing the form and blanket sleeves. Operators can change cut-offs within a range of 200mm in approximately 30 minutes. At Drupa 2000, MAN Roland showed the press with inline finishing equipment.

Although MAN Roland are currently quoting prices and taking orders for this press, it is estimated that customer installations will not commence until 2002. At a price of \$3.75m, it is the most expensive DI press on the market.



Ryobi 3404 DI

Ryobi

At Drupa 2000, Ryobi debuted their first DI press, the 3404 DI. Jointly developed with Presstek, the press is a two-up, four-color device designed for commercial printers. The press uses a V-shaped, satellite, five-cylinder arrangement with a triple diameter impression cylinder at the center, and a pair of double-diameter blanket and plate cylinders. Presstek Pearl-Dry Plus plates are stored on rolls inside the two plate cylinders. Imaging time is approximately five minutes and 30 seconds at 2540 dpi. The Ryobi 'Program Inking' supplies ink to the rollers, and printing starts automatically. An IR dryer is available as an option to reduce drying time needed for reverse-side printing.

This compact press offers new competition to Heidelberg's Quickmaster DI 46-4, which also uses a common-impression cylinder design. Ryobi OEM the 3404 DI to Xerox, which is sold as the DocuColor 233 DI-4. It is understood that Xerox have an exclusive sales agreement with Ryobi, and the press is currently only available through Xerox.

Sakurai

Sakurai offer a 29-inch DI press, the Oliver 474EPII DI. The press is a four-up unit that incorporates automatic plate changing, automatic ink density control and a sheet preset device. It is available with four, five or six-color units, and can be run either in 'DI mode' using Presstek PearlGold plates, or 'conventional mode' using any other plate brand made offline. Pricing starts at \$1.2m.

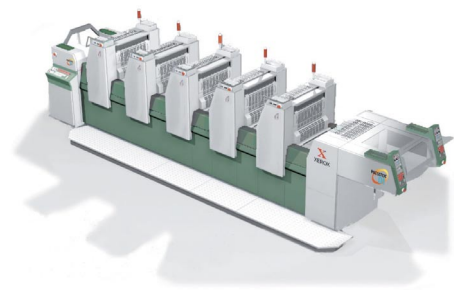
Screen

This Japanese vendor has three DI presses under their 'TruePress' family. The TruePress 544, a two-up, four-color press, is designed for the short-run digital printing market. The press uses conventional inks and consumables. The 544 has two main components. The first component is the press, which houses the digital imaging heads, inking units and printing cylinders. The second component is the HC-110, a controller that handles a variety of tasks such as job control and RIP processing of page files. Flexible plates are imaged directly on the plate cylinder. Automation incorporates plate loading, unloading, exposure and development. The press is rated at 4,000 iph for four-color work and 8,000 iph for two-color.



Screen TruePress 744

Screen also offer a four-up, four color press, the TruePress 744. The press uses two '742' units in series; the 742 is a two-color, single printing unit which was first previewed at IGAS in September 1999. The press chassis is built by Sakurai, and the imaging and printing units are built by Screen. Each press unit holds two separate Mitsubishi Silver Digiplate polyester plates on its imaging drum. These plates are loaded from a plate cassette, rather than from a reel. The imaging system is taken from Screen's Tanto imagesetter. It comprises of a 660nm, 120-beam IR laser, which moves across the plates, as the press cylinders rotate during plate exposure. The overall imaging time for both plates is ten minutes. The transfer cylinder can be configured to turn the sheet over, allowing the 744 to act as a two-color perfecter, or it can pass the sheets straight through, printing four colors on one side. Maximum speed is 8,000 iph, and 6,000 iph when perfecting. In addition, it is understood that Screen is currently developing a six-color model, the TruePress 746 (three 742's in series), although no formal announcements have been made concerning this product.



Xerox DocuColor 400 DI-5

Xerox

At GraphExpo 2000, Xerox debuted two DI presses, the DocuColor 400 DI 4/5, and the DocuColor 233 DI-4. The DocuColor 400 DI-4/5 was first shown at Drupa 2000 as the PAX (Presstek-Adast-Xerox). The press is sold as the DI-4 (four-color units) or the DI-5 (five-color units). Adast are the OEM of this press, but Xerox currently have a semi-exclusive sales agreement, and no other vendor can sell this press.

The DocuColor 233 DI-4 is a two-up, four-color common-impession cylinder press. Ryobi are the OEM of this press, which is sold as their 3404 DI model. It is understood that the OEM agreement between Xerox and Ryobi is also semi-exclusive, and Xerox are the only sales channel for this press.

Imaging System Vendors

CreoScitex

At Graph Expo 2000, CreoScitex debuted their “SP Plateless” technology (“SP” stands for “switchable polymer”). The technology was demonstrated on a Shinohara press with one printing unit. The technology works in five separate stages:

1. The previous job is washed off the plate cylinder with solvents.
2. Agfa LiteSpeed polymer fluid is sprayed over the entire plate cylinder.
3. The plate is imaged using CreoScitex’s 830nm Square-Spot technology.
4. Dampening solution is applied to the plate, and the solution weakens the unexposed plate coating.
5. The ink rollers are applied to the plate. The ink tack pulls off and shreds the weak unexposed areas of the plate (the non-image area), exposing bare aluminum, which is hydrophilic.



CreoScitex SP demonstration at Graph Expo 2000.
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Although the ink on the form rollers is contaminated by the removed plate material, this quickly disappears onto makeready sheets. The technology is impressive and offers a potential impact on the future of offset printing—a plateless market. However, CreoScitex’s concept is still under development and estimated to be two years away from becoming a mature product.

Presstek

Presstek is the largest vendor of imaging systems for DI presses. Of the 17 DI presses which are either under development or currently available, Presstek imaging heads are integrated in 10 of these presses. At Drupa 2000 Presstek debuted ProFire, a new plate imaging system which replaces its old Pearl imaging system.

ProFire uses an array of eight laser clusters, spaced at two-inch intervals across the width of the exposure system. Each cluster holds four laser diodes, each of which records its own spot. The pixel data are fed to the lasers through drivers which have a 70-nanosecond rise time, allowing very sharp dot formation on the plate. Resolution is set at the factory to either 2,400 dpi and its submultiples (i.e. 1,200 and 1,800 dpi) or 2,540 dpi and submultiples. The spot size can be set either to 14 or 21 microns.

Although Presstek will offer upgrades of this new imaging system to current Pearl systems, it is understood that it will not be feasible to upgrade Heidelberg Quickmaster DI 46-4 or Adast 700 series presses due to their design.

Comparison of all DI Presses Currently Available and Under Development

Vendor	Product	Imaging System	Plate media	Maximum sheet size	Colors	Waterless?	Sheet/ Web	Max. speed (iph)	Options	Avail?
Adast	507 DI	Presstek ProFire	Presstek Pearldry Plus ¹	15x20.5"	4	Yes	Sheet	12,000	Perfecting unit	Yes
Adast	705C DI	Presstek Pearl	Presstek Pearldry ²	19x26"	4–5	Yes	Sheet	10,000	Perfecting unit	Yes
Akiyama	J Print DI	Presstek ProFire	Presstek Pearldry ²	20x29"	4–6 ³	Yes	Sheet	15,000	—	No
Didde	TBA	Presstek ProFire	TBA	TBA	4–6	TBA	Web	TBA	TBA	No
Heidelberg	Quickmaster DI 46-4	Presstek Pearl	Presstek Pearldry Plus ¹	13.39x18.11"	4	Yes	Sheet	10,000	Auto blanket washer	Yes
Heidelberg	Speedmaster 74 DI	CreoScitex Square-spot	Various thermal CTP plates can be used	20.9x29.1"	4–6	No	Sheet	15,000	Perfecting units	Yes
Karat Digital Press	74 Karat	CreoScitex laser diodes	Presstek Pearldry ²	20.5x29.1"	4	Yes	Sheet	10,000	—	Yes
Komori	Project D	CreoScitex Square-spot	TBA	28.4x40.6"	4–6	No	Sheet	TBA	Perfecting unit	No
MAN Roland	DICOWeb	CreoScitex Square-spot	Thermal transfer polymer ribbon	N/A	4	No	Web	N/A	N/A	No
Ryobi	3404 DI	Presstek ProFire	Presstek Pearldry Plus ¹	13.39x18.11"	4	Yes	Sheet	7,000	IR dryer	Yes
Sakurai	Oliver 474EPII DI	Presstek ProFire	Presstek Pearlgold ²	21x29.1"	4–6	No	Sheet	13,000	Perfecting unit and coater	No
Screen	TruePress 544	633nm laser diode	Mitsubishi Silver Digiplate ¹	15.5x21.4"	4	No	Sheet	4,000	Perfecting unit	Yes
Screen	TruePress 744	660nm laser diodes	Mitsubishi Silver Digiplate ⁴	21.06x29.13"	4	No	Sheet	8,000	TBA	No
Screen	TruePress 746	660nm laser diodes	Mitsubishi Silver Digiplate ⁴	21.06x29.13"	6	No	Sheet	8,000	TBA	No
Xerox	DocuColor 400 DI-4/5	Presstek ProFire	Presstek Pearldry Plus ¹	15x20.5"	4–5	Yes	Sheet	12,000	Perfecting unit	Yes
Xerox	DocuColor 233 DI-4	Presstek ProFire	Presstek Pearldry Plus ¹	13.39x18.11"	4	Yes	Sheet	7,000	IR dryer	Yes

NOTES: 1. Polyester roll, 2. Aluminum sheet, 3. In-line perfecting on all colors, 4. Polyester sheet, TBA = To be announced, N/A = Detail not available

Conclusion

The DI market has grown tremendously over the last decade. With the increasing need for fast job turnarounds, digital workflows, and press automation, it is clear that there is a continuing demand for DI presses. Out of all printing technologies, DI technology has exhibited one of the largest growth rates over the past decade. There is no doubt that this technology is far from mature, as advancements in imaging speed, press automation, and plateless technology continue to evolve.



About the Author

Industry analyst, Eliot Harper is actively involved in assessing products and trends in the graphic arts industry. Eliot's key areas of interest are print e-commerce, digital printing, CTP, RIPs, and DI press technology. Eliot holds a Bachelor of Arts degree in Printing Management from London College of Printing (LCP), and a Master of Science degree in Printing Technology from Rochester Institute of Technology (RIT). Eliot is a frequent contributor to several industry publications, and has held numerous presentations and seminars including speaking at Graph Expo and Seybold Seminars. *Contact Eliot*

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