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New Technology Announcements Extend Xeikon's Market Reach

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Abstract

Xeikon's technology announcements in 2008 included higher speed, higher imaging addressability, and increased productivity. The higher addressability, along with new toner technology for the Xeikon 8000, brings the latest technology platform to new levels of quality. Xeikon's 2008 technology announcements build on a strong history of platform developments, new toner formulations, and a dedication to productivity and ecological friendliness. This analysis provides an overview of the new products and places them in perspective with existing and past Xeikon products. It also includes a profile of Odyssey Digital Printing, a Xeikon customer in Tulsa, Oklahoma.

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Introduction

The announcements that Xeikon has made in 2008 build off of a company heritage in production digital color printing that goes back to the late 1980s when the company was founded. This analysis will cover Xeikon's news from 2008 and place these developments in perspective with the company's existing products and its ongoing evolution in the marketplace. Additionally, to provide insight on how Xeikon products are being used in the field, this analysis includes a profile of Odyssey Digital Printing, a leading-edge Xeikon customer based in Tulsa, Oklahoma.

Xeikon's 2008 Announcements

At drupa 2008 in May, speed increases in production color digital print drew headlines. Xeikon was among the top newsmakers during the show, and its major announcements included the Xeikon 8000, the Xeikon 3300, the Xeikon 6000 with 1,200 by 3,600 dot-per-inch (dpi) imaging addressability, and Productivity Adapted (PA) toner for the Xeikon 8000. In addition, the company announced that its Xeikon 5000plus, which comes standard with the 600 dpi imaging addressability, can be upgraded to 1,200 by 3,600 dpi. Existing Xeikon 5000plus and 6000 units in the field can also benefit from the upgrade to 1,200 by 3,600 dpi.

In September at Labelexpo Americas 2008, Xeikon extended its simplex portfolio with the launch of the Xeikon 3000. The Xeikon 3000 joins the 3300 in Xeikon's product portfolio for the label and packaging markets. Both the Xeikon 3300 and 3000 use Xeikon's previously launched and well-established Form Adapted (FA) toner technology.

These developments are described in detail below.

The Xeikon 8000

At a maximum speed of 56 feet per minute (244 letter-size images per minute[1]), the new Xeikon 8000 is 45% faster than its predecessor, the Xeikon 6000. This makes it the fastest production digital color device capable of delivering graphic arts quality printing available today. Aside from increased speed, the Xeikon 8000 also features an increased imaging addressability[2] of 1,200 by 3,600 dpi. All Xeikon models before the Xeikon 8000 were 600 dpi. The tonal resolution of the Xeikon 8000 is four bits per pixel (i.e., sixteen gray levels per pixel), which is the same as previous models. The higher imaging addressability provides better rendering of text, line graphics, and halftones. It also reduces image noise to make gradations even smoother and allows for screen rulings up to 240 lines per inch (lpi). The imaging width has been increased slightly to 19.84 inches (504 millimeters). Given that the Xeikon devices can print extremely long[3] images on a paper web, the Xeikon 8000 is the largest format digital device outside the wide format printer arena. The Xeikon 8000 can print on substrate weights ranging from 27 lb text (40 gsm) to 16-point board stock (350 gsm).

[1] Calculated using a two-up duplex layout
[2] Imaging addressability is sometimes called "spatial resolution" or simply "resolution," but imaging addressability is the more accurate description.
[3] Xeikon customers commonly produce poster or signage applications that are 6+ feet long, well beyond the capabilities of other digital print products. A hundred-foot-long image would be possible if the customer had an application for images of that length.

Figure 1: The New Xeikon 8000

The Xeikon 8000 uses a new type of toner that Xeikon calls Productivity Adapted (PA). PA toner has been adapted for the higher speed and monthly duty cycles of the 8000. Xeikon notes that these improvements come without any quality compromises and that the new toner also guarantees substantial improvements in cost-effectiveness at higher monthly page volumes. PA toner is Pantone-certified. Continuing the recent trend toward more process control, the Xeikon 8000 is equipped with two in-line densitometers for color consistency.

The Xeikon 8000 uses the X-800 front end and accepts PostScript, PDF, and PPML. Native IPDS support is optional. Installing the IPDS option usually requires integration into the customer's data stream infrastructure and workflow by Xeikon. With the Xeikon 8000, Punch Graphix is targeting the direct mail, book publishing, and transactional/TransPromo markets in particular. The IPDS capability will be especially handy for the transactional/TransPromo applications. During its presentation at drupa 2008, Xeikon showed other applications as well, covering the whole range of promotional applications. According to Punch Graphix, the 8000 is rated for 9.0 million impressions per month. The Xeikon 8000 was launched at drupa and is available now. Some units have already been installed at customer locations in the United States and Europe.

Figure 2: The Xeikon 8000 at drupa 2008

At drupa 2008, Xeikon demonstrated its Xeikon 8000 with a jumbo reel unwinder for maximum reel diameters of 54 inches (1.37 meters). Using a 100-gsm substrate for its drupa demonstration, Xeikon showed how this configuration was capable of producing 12 hours of uninterrupted printing. Xeikon reports that most of its users opt for the jumbo reel unwinder, though users also have the option of choosing a smaller unwinder if they prefer. The 8000 is available with a rewinder (for roll-to-roll configuration) or a stacker (for roll-to-sheet configuration). The Xeikon 8000 can also operate inline with different finishing systems depending upon the application requirements. Users also have the option of using a Web Finishing Module, which applies a thin silicone oil-wax-water coating. This coating provides several advantages, including protection against the type of abrasion that can occur in postal sorting systems, removal of static charges, and minimization of substrate curling.

The Xeikon 6000 with 1,200 by 3,600 dpi Imaging Addressability

When it was first introduced, the Xeikon 6000 had an imaging addressability of 600 by 600 dpi. All newly-manufactured Xeikon 6000s will offer 1,200 by 3,600 dpi capability. The new Xeikon 6000 is identical to the earlier Xeikon 6000 units except for this addressability increase and the slightly wider print width that comes along with it.

The Xeikon 3300 and Xeikon 3000

At drupa 2008, Xeikon launched its Xeikon 3300, which produces simplex prints and is targeted toward the label and flexible packaging markets. It can print the four process colors plus a range of standard or custom spot colors for exacting reproduction of logos and brand colors. It can also apply other toners, including a special security toner (for anti-counterfeiting applications) and an opaque white toner (required for printing on transparent label substrates).

Figure 3: The new Xeikon 3300 (shown here with an in-line finishing capable of die-cutting, UV-coating, "supergloss[4]," slitting, and rewinding

The 3300 features a linear speed of 63 feet per minute (fpm)[5] and a monthly duty cycle of 2,300,000 feet. The web width on the 3300 is 13 inches (330 millimeters). The 3300 has a rated speed setting of 31.5 fpm (9.6 mpm) for printing on cardboard and other thick substrates. Xeikon points out that the speed is

[4] Supergloss refers to a reusable laminate film that is applied to the label and stripped off afterwards. It creates a shiny, glossy surface that attracts attention to any areas that are so treated.
[5] 19.2 meters per minute (mpm)

independent of the number of colors that are required for a specific job. (This holds true for any of the Xeikon units, not just the simplex ones.)

Like the new 8000 model, the 3300 features 4-bit density per spot and an imaging addressability of 1,200 by 3,600 dpi. This triples the addressability in the direction of the web. The 3300 has the same X-800 digital front end as other Xeikon products.

The Xeikon 3300 uses Form Adapted (FA) toner, which is FDA-approved for non-direct food contact. By using a different magenta toner containing a different pigment (see more on this below), the toner then becomes FDA-approved for direct food contact for dry and non-oil containing food items, which is a distinct advantage for food label applications. In addition, the FA toner and its standard spot colors are Pantone-certified.

The Xeikon 3300 has a web width of 13 inches (330mm), which Xeikon believes is the best fit for label applications. A wide range of substrates are available for the 3300, including self-adhesive label stocks (paper, PP, PET, vinyl, co-extruded), unsupported film, and paperboard. In addition, the Xeikon 3300 can print on substrate weights ranging from 27 lb text (40 gsm) to 16-point board stock (350 gsm). It is also important to note that the Xeikon 3300 uses commercially available standard label stocks and does not require any pre-coating or pretreatment of the substrates.

Figure 4: Xeikon 3300 and In-Line Finisher Shown at drupa 2008

The product's main application will be label printing, but printing on cardboard up to 16 pt. thickness is possible as well. The 3300 is currently shipping.

Launched at Labelexpo Americas 2008, the Xeikon 3000 is the entry-level counterpart to the Xeikon 3300. Xeikon is targeting the 3000 toward label converters who want to print labels digitally but do not yet need the speed or productivity levels of the Xeikon 3300. Another target for Xeikon is label converters who want to focus on niche applications such as paperboard packaging or textile transfer printing. With a top speed of 31.5 feet per minute and a monthly duty cycle of 1,150,000 feet, the Xeikon

3000 provides a lower-price complement to the Xeikon 3300. The Xeikon 3000 can be upgraded to the Xeikon 3300.

The Xeikon 3000 is otherwise identical to the Xeikon 3300 in all other respects, including web width and format flexibility (7.9 inches to 13 inches), imaging addressability (1,200 by 3,600 dpi), and substrate weight support (27 lb text to 16-point board stock). The Xeikon 3000 is shipping now.

Table 1: Comparing the Xeikon 3300 with the Xeikon 3000

Specification	Xeikon 3300	Xeikon 3000
Speed	63 fpm	31.5 fpm
Duty Cycle	2.3 million feet	1.15 million feet
List Price	USD $730,000	USD $550,000
Other		Fully upgradeable to a Xeikon 3300

At Labelexpo Americas, Xeikon was presented with the 2008 New Innovation award. This award, which is judged by a panel of international label experts, is part of the 2008 Label Industry Global Awards. Sponsored by RotoMetrics, the Label Industry Award for New Innovation is given to an innovative, pioneering, and environmentally-conscientious new supplier or converter company that meets key selection criteria, including being instrumental in successfully introducing a key new science, product, or technology solution to the label industry. The award was announced at a dinner on the opening day of Labelexpo Americas.

Figure 5: Xeikon Received the New Innovation Award this Year at Labelexpo Americas

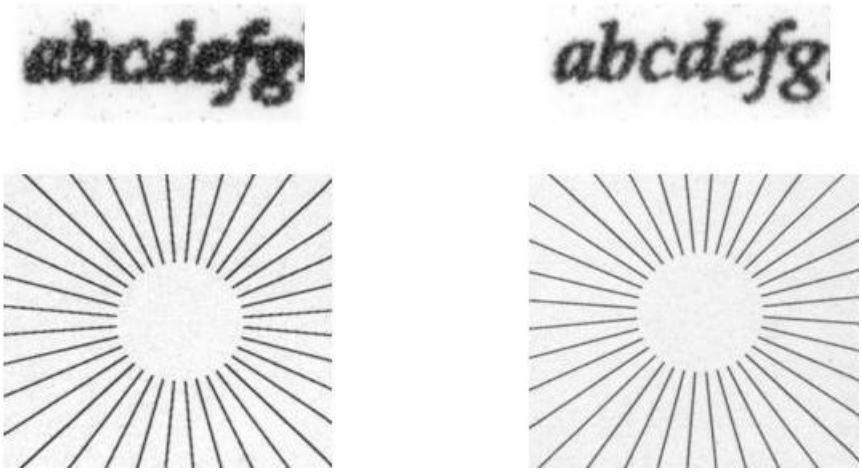
Image Addressability Upgrade for the Xeikon 5000plus and Current Xeikon 6000

The 1,200 by 3,600 dpi imaging addressability is not limited to Xeikon's new products. The previously sold Xeikon 6000 and 5000plus can also get the higher imaging addressability as field upgrades. Newly shipped Xeikon 6000 units will include the 1,200 by 3,600 dpi imaging addressability as a standard feature. The print width for units with the 1,200 by 3,600 dpi imaging addressability upgrade is 19.7 inches (versus 19 inches for units with 600 by 600 dpi). Xeikon has designed a marketing strategy around this increased imaging addressability and uses a special logo (see Figure 6) in association with the products that have that capability.

Figure 6: Xeikon 1,200 dpi/Four Bit per Spot Logo

The practical impact of the higher imaging addressability can be seen in some examples provided by Xeikon. The images in Figure 7 illustrate how linework and text is sharper when reproduced at a higher 1,200 by 3,600 dpi.

Figure 7: Text and linework reproduced at 600 by 600 dpi (left); the same images reproduced at 1,200 by 3,600 dpi (right)



600 by 600 dpi **1,200 by 3,600 dpi**

Source: Xeikon

The second example in Figure 8 shows the ability of the higher imaging addressability setting to produce a 240 lpi halftone, which has a much finer halftone rosette pattern than the 170 lpi halftone shown on the left.

Figure 8: A 170 lpi halftone reproduced at 600 by 600 dpi/4 bits per pixel (left); a 240 lpi halftone reproduced at 1,200 by 3,600 dpi/4 bits per pixel (right)

Source: Xeikon

Image quality as perceived by the human eye is the result of a complex interplay of various factors. These include the ability to produce sharp edges for text and linework; the ability to maintain detail in highlights and shadows; the ability to produce uniform tints, blends, and halftones with smooth tonal transitions; the ability to print dense solids, and the ability to reproduce images accurately without inserting any artifacts related to the digital print process. As we have seen, a number of factors work to the advantage of the Xeikon devices in regard to image quality. These include:

- **Multi-level bit depth:** Xeikon's LED[6] arrays have the ability to modulate the intensity of the light they produce, which allows multiple output levels per spot. This has important implications for the reproduction of smooth tints and for the accurate reproduction of halftone images.
- **Imaging addressability:** The increase to 1,200 by 3,600 dpi imaging addressability has several implications. It improves the ability to produce sharp edges for text and linework. It also opens up new possibilities in halftoning, including the ability to produce finer halftone screen rulings with the required number of gray levels to ensure smooth tints and tonal transitions.
- **Technology factors:** Just as halftone screening algorithms play a key role in taking advantage of factors like multi-level bit depth and increased imaging addressability, a variety of other technology factors are critical to image quality. These include items such as the size of the spots created by the LED array, the size of the toner particles, the interaction between the toner and the imaging system, the nature of the substrate and its interaction with the printing system, and the data processing capability of the front end system.

Design Considerations for Toner and Product Design

Xeikon notes that its PA and FA toners combine the advantages of both traditionally and chemically produced toners while minimizing any disadvantages. Xeikon's dry toner technology uses a "traditionally-produced chemical-looking toner particle." This means that the toner technology is based on a traditional polyester composition, but with the benefits of shape modification. Xeikon notes that these qualities contribute to extremely high transfer efficiencies, strong image quality, and extended color gamut.

Xeikon describes the individual toner particles as being "potato-shaped" as opposed to the rougher particle structure of the previous Version 3 toner particles. According to Xeikon, the smoother particle size and sharper size distribution contribute to a variety of improvements, including a much better response to the whole electrophotographic process. Xeikon describes its Form Adapted toner as a traditional, high-end polyester resin-based shape-modified toner that provides the benefits of the smooth form of chemical toner particles in a melt-pulverized toner. These are not chemical toners.

In addition to cyan, magenta, yellow, and black, Xeikon offers spot color toners, including red, green, blue, orange, white, clear, and extra magenta. The "extra magenta" has certain distinct advantages. It is a brighter magenta that can be used in the fifth station or the standard magenta station. Benefits of this extra magenta toner also include the highest lightfastness possible for magenta and a better ability to color-match the output of other production color devices. The extra magenta is also approved for direct food contact in packaging (when it replaces the regular magenta). The FA and PA toner technologies allow for the creation of custom colors. When customers require an exact match (closer than a Pantone-certified four-color reproduction of a specific color), they can special order it.

[6] LED stands for Light Emitting Diode.

To ensure that the printing process is environmentally-friendly for its customers, Xeikon believes that a printing system should:

- Minimize production waste
- Consume less energy and raw materials compared to traditional (offset) printing
- Produce no VOCs (volatile organic compounds)
- Produce printed paper that is recyclable
- Contain no harmful ingredients

Xeikon notes that its current PA and FA toners fulfill all of these requirements. Xeikon's new PA toner is for the Xeikon 8000 only. The other Xeikon offerings (Xeikon 6000, 5000plus, 4000, 3300, and 3000) use the FA Toner.

Xeikon has addressed the environmental aspects not only in its toner technology, but also in the design and development of its products and other consumables. As a result, Xeikon has received several awards and certifications in the environmentally-friendly arena, including:

- 2003-2004: Environmental Belgian Award for sustainable product development
- 2006: FDA approval for the complete range of FA Toner for use in food packaging
- 2007: Formal approval by the Ingede organization (http://www.ingede.com/) for the good de-inkability of the toner system
- 2007: Approval of consumables by the Nordic Ecolabel organization (http://www.ecolabel.nu/)
- 2007: National Packaging award for the unique accomplishment of reusing the packaging materials of the shipped engines

Overview of Xeikon's Product Portfolio

With its 2008 technology announcements, Xeikon's product line now includes the simplex Xeikon 3300 and 3000, the duplex Xeikon 4000, the Xeikon 5000plus, the Xeikon 6000, and the Xeikon 8000.

- **The Xeikon 4000:** The Xeikon 4000 supports media widths from 19.7 inches to 20 inches and has an imaging width of 19 inches. The Xeikon 4000 prints at a top speed of 31.5 feet per minute (137 letter-size images per minute) and has a monthly duty cycle of 4.0 million pages. It is capable of printing on substrates ranging from 27 lb text (40 gsm) to 90-lb cover stock (250 gsm). It comes standard with 600 by 600 dpi imaging addressability with variable dot density (4 bits per spot). As Xeikon's entry-level duplex offering, the 4000 is only available in the 4/4 configuration.
- **The Xeikon 5000plus:** The Xeikon 5000plus supports media widths from 12.6 inches to 20 inches and has an imaging width of 19 inches. The Xeikon 5000plus prints at a top speed of 31.5 feet per minute (137 letter-size images per minute) and has a monthly duty cycle of 4.5 million pages. It is capable of printing on substrates ranging from 27 lb text (40 gsm) to 16-point board stock (350 gsm). It comes standard with 600 by 600 dpi imaging addressability with variable dot density (4 bits per spot). The Xeikon 5000plus can be field upgraded to a Xeikon 6000. The field upgrade includes two parts, which can be implemented separately: (1) an increase in its imaging addressability to 1,200 by

3,600 dpi[7], and (2) a speed upgrade to 39 feet per minute (170 letter-size images per minute). The Xeikon 5000plus is available in 4/4 or 5/5 configurations.

- **The Xeikon 6000:** The Xeikon 6000 supports media widths from 12.6 inches to 20 inches and has an imaging width of 19.7 inches. The Xeikon 6000 prints at a top speed of 39 feet per minute (170 letter-size images per minute) and has a monthly duty cycle of 5.3 million pages. It is capable of printing on substrates ranging from 27 lb text (40 gsm) to 16-point board stock (350 gsm). Unlike the Xeikon 4000 and 5000plus, it comes standard with 1,200 by 3,600 dpi imaging addressability. It is available in 4/4 or 5/5 configurations.
- **The Xeikon 8000:** The Xeikon 8000 supports media widths from 12.6 inches to 20.2 inches and has an imaging width of 19.8 inches. It is the fastest of the duplex devices and has a top speed of 56 feet per minute (244 letter-size images per minute) with a monthly duty cycle of 9.0 million pages. It is capable of printing on substrates ranging from 27 lb text (40 gsm) to 16-point board stock (350 gsm). It comes standard with 1,200 by 3,600 dpi imaging addressability and is available in 4/4 or 5/5 configurations.
- **The Xeikon 3300:** The Xeikon 3300 is the company's top-of-the-line digital offering for label and package printing applications. It is a simplex device that supports web widths from 7.9 inches to 13 inches with an imaging width of 12.7 inches. It is capable of printing at speeds up to 63 feet per minute and has a monthly duty cycle of 2.3 million feet. The Xeikon 3300 can print on substrates ranging from 40 gsm (27 lb text) to 350 gsm (122 lb cover). It comes standard with 1,200 by 3,600 dpi imaging addressability and is available in the 5/0 configuration.
- **The Xeikon 3000:** The Xeikon 3000 is the entry-level counterpart of the Xeikon 3300. It can print at speeds up to 31.5 feet per minute and has a monthly duty cycle of 1.15 million feet. The Xeikon 3000 is identical to the Xeikon 3300 in all other respects.

Xeikon's Duplex Products for the Graphics Market

The Table below provides a comparison of the four duplex Xeikon offerings. These products are primarily targeted toward users in graphically-oriented markets such as commercial print, direct mail, book printing, transactional document printing, point-of-purchase and point-of-sale graphics, and print-on-demand as well as some specialty applications such as heat transfers to textiles and wallpaper mural printing.

[7] The imaging addressability upgrade is accompanied by an increase in the imaging width of the Xeikon 5000plus from 19 inches to 19.7 inches.

Table 2: Comparing the Xeikon 4000, 5000plus, 6000, and 8000

	Xeikon 4000	Xeikon 5000plus	Xeikon 6000 (1,200 by 3,600 dpi)	Xeikon 8000
Intro date	February 2007	February 2007	May 2008[8]	May 2008
Color capability	4/4 hardware configuration	4/4 or 5/5 hardware configuration	4/4 or 5/5 hardware configuration	4/4 or 5/5 hardware configuration
Speed	Up to 137 letter-size images per minute	Up to 137 letter-size images per minute	Up to 170 letter-size images per minute	Up to 244 letter-size images per minute
Web speed	Up to 31.5 ft/min (9.6 mpm)	Up to 31.5 ft/min (9.6 mpm)	Up to 39 ft/min (11.9 mpm)	Up to 56 ft/min (17 mpm)
Web width	Supports widths from 19.7 to 20 inches (500 to 508 mm)	Supports widths from 12.6 to 20 inches (320 to 508 mm)	Supports widths from 12.6 to 20 inches (320 to 508 mm)	Supports widths from 12.6 to 20.16 inches (320 to 512 mm)
Print width	19 inches (483 mm)	19 inches (483 mm)[9]	19.7 inches (483 mm)	19.84 inches (504 mm)
Imaging Addressability	600 by 600 dpi, 4-bit	600 by 600 dpi, 4-bit (upgrade-able to 1,200 by 3,600 dpi)	1,200 by 3,600 dpi 4-bit	1,200 by 3,600 dpi 4-bit
Substrates	27 lb text (40 gsm) to 90-lb cover (250 gsm)	27 lb text (40 gsm) to 16-point board stock (350 gsm)	27 lb text (40 gsm) to 16-point board stock (350 gsm)	27 lb text (40 gsm) to 16-point board stock (350 gsm)
Duty cycle	4,000,000 images per month	4,500,000 images per month	5,300,000 images per month	9,000,000 images per month
DFE	X-800	X-800	X-800	X-800
Toner	FA	FA	FA	PA
Pantone	Pantone-certified	Pantone-certified	Pantone-certified	Pantone-certified
Other features	Simultaneous Duplex Printing Proofing and control desk with proofing light	Simultaneous duplex printing Automated in-line density & registration control Proofing and control desk with proofing light	Simultaneous duplex printing Automated in-line density & registration control Proofing and control desk with proofing light	Simultaneous duplex printing Automated in-line density & registration control Proofing and control desk with proofing light
Options	Cut sheet stacker with removable cart Web Finishing Module IPDS support Standard or Jumbo Reel Unwinder Jumbo Reel Rewinder Inline Finishing	Cut sheet stacker with removable cart Web Finishing Module IPDS support Standard or Jumbo Reel Unwinder Jumbo Reel Rewinder Inline Finishing	Cut sheet stacker with removable cart Web Finishing Module IPDS support Standard or Jumbo Reel Unwinder Jumbo Reel Rewinder Inline Finishing	Cut sheet stacker with removable cart Web Finishing Module IPDS Support Standard or Jumbo Reel Unwinder Jumbo Reel Rewinder Inline Finishing
U.S. pricing	$500,000	$625,000	$795,000	$990,000

[8] First introduced in September 2006 with 600 by 600 dpi imaging addressability and later re-introduced in May 2008 with 1,200 by 3,600 dpi imaging addressability

[9] 19.7 inches in combination with the 1,200 by 3,600 dpi imaging addressability upgrade

Some items become clear from Table 2. The devices all have the following in common:

- All use LED-array based, dry toner electrophotographic technology
- All products have Xeikon's One-Pass-Duplex capability to ensure accurate front-to-back registration as well as the data integrity that comes along with the reduced possibility of error because the front and back are printed simultaneously
- All products are roll-fed/web-fed production printers with no limitation in the length of the printed image
- All use the X-800 Digital Front End
- All products can operate in roll-to-roll, roll-to-sheet, or roll-to-inline finishing configurations
- Printing speed is the same whether printing one, two, three, four, or five colors
- All are available now

Some key differentiators of the four Xeikon duplex offerings include:

- The Xeikon 8000 and all new Xeikon 6000 units have 1,200 by 3,600 dpi imaging addressability standard. Xeikon 5000plus and existing Xeikon 6000 units in the field are all 600 dpi, but can be upgraded to 1,200 by 3,600 dpi.
- The Xeikon 8000 supports web widths from 12.6 to 20.2 inches. The Xeikon 6000 and 5000plus support web widths from 12.6 to 20 inches. The Xeikon 4000 only supports web widths from 19.7 to 20 inches.
- The Xeikon 8000 supports slightly wider web widths (as described above) as well as slightly wider imaging widths of up to 19.84 inches. The Xeikon 6000 has a maximum imaging width of 19.7 inches. The Xeikon 5000plus[10] and Xeikon 4000 have a maximum imaging width of 19 inches.
- The Xeikon 5000plus, Xeikon 6000, and Xeikon 8000 support heavier stocks (up to 122 lb cover/16-point board stock/350 gsm). The Xeikon 4000 only supports up to 90 lb cover (250 gsm).
- Producing 244 letter-sized ppm, the Xeikon 8000 is the fastest of the duplex Xeikon devices.
- The Xeikon 4000 is not available in a 5/5 configuration and lacks some of the items that are included with the 5000plus, 6000, and 8000 such as the variable web width module (to support web widths as low as 12.6 inches) and the automated in-line density & registration control.
- The Xeikon 8000 uses PA Toner. All other models use the FA toner. Both the FA and PA Toner are Pantone-certified.
- The Xeikon 5000plus can be field upgraded to a Xeikon 6000. This field upgrade includes an increase in the imaging addressability from 600 by 600 dpi to 1,200 by 3,600 dpi, a speed upgrade from 31.5 feet per minute (137 letter-size images per minute) to 39 feet per minute (170 letter-size images per minute), and a slight increase in its imaging width from 19 inches to 19.7 inches.
- Existing Xeikon 6000 units in the field (with 600 by 600 dpi) can be upgraded to 1,200 by 3,600 dpi.

[10] When upgraded to 1,200 by 3,600 dpi, the Xeikon 5000plus supports imaging widths of up to 19.7 inches

One nuance of the product differentiation is the speed at which the Xeikon 4000, Xeikon 5000plus, Xeikon 6000, and Xeikon 8000 are able to run heavier substrates. As mentioned earlier, the Xeikon 4000's top supported substrate is 250 gsm. The Xeikon 8000 can generate 244 letter-sized ppm for stocks up to 100 gsm. See Table 3 for full details.

Table 3: Xeikon 4000, 5000plus, 6000, 8000 – Speeds at Different Substrate Weights (in letter-size full-color images, when printing double-sided)

	Speed (in letter-size full-color images)			
Substrate Weight	**Xeikon 4000**	**Xeikon 5000plus**	**Xeikon 6000**	**Xeikon 8000**
Up to 100 gsm	137	137	170	244
Up to 150 gsm	137 (up to 170 gsm)	137	170	207
Up to 200 gsm	74	137	170	170
Up to 250 gsm	74	137	137	137
Up to 300 gsm	Not Supported	106	106	106
Up to 350 gsm	Not Supported	74	74	74

Source: Xeikon specification sheets

Xeikon Product History: Duplex

Table 4 provides a top-level overview of the major product offerings that Xeikon has announced since its inception. The company's first product offering, the DCP-1, used Xeikon's innovative simultaneous duplex printing capability. The DCP-1 supports a 12.6" web width at a web speed of 17 feet per minute, allowing production of 37 letter images per minute. Today with the 8000, the maximum web width is more than 20 inches, the web speed has more than tripled, the print productivity in letter images has increased by more than six times, and the range of supported substrates has expanded. Early on, Xeikon offered products with 12.6" and 20" maximum web widths. After Punch acquired and restructured the company, the narrow format duplex line was discontinued. All of Xeikon's current duplex products have widths of 20 inches or more.

The Table below clarifies how Xeikon has consistently introduced next-generation toners. Two other improvements are important to point out in the historical development of the company's product line:

- 2006: The ability to handle a broader range of web widths
- 2008: The imaging addressability increase to 1,200 by 3,600 dpi

Table 4: A View of Xeikon's Duplex Color Technology over Time

Product name	DCP-1	DCP-32D	DCP-50D	DCP-320D	DCP-500D	Xeikon 5000	Xeikon 6000	Xeikon 8000
Web width (inches and millimeters)	12.6" (320 mm)	12.6" (320 mm)	20" (508 mm)	12.6" (320 mm)	20" (508 mm)	19.7" to 20" (500 to 508 mm)	12.6" to 20" (320 to 508 mm)	12.6" to 20.16" (320 to 512 mm)
Imaging Width (inches and millimeters)	12.1" (307 mm)	12.1" (307 mm)	18.7" (475 mm)	12.1" (307 mm)	18.7" (475 mm)	19" (483 mm)	19.7" (500 mm)	20.16" (512 mm)
Web speed (feet and meters per minute)	Up to 17 fpm	Up to 17 fpm	Up to 24 fpm	Up to 44.8 fpm (13.65 mpm)	Up to 31.5 fpm (9.6 mpm)	Up to 31.5 fpm (9.6 mpm)	Up to 39 fpm (12 mpm)	Up to 56 fpm (17 mpm)
Max. speed (letter ipm)	37 ipm	37 ipm	106 ipm	126 ipm	137 ipm	137 ipm	170 ipm	244 ipm
Imaging addressability	600 by 600 dpi	600 by 600 dpi	600 by 600 dpi	600 by 600 dpi	600 by 600 dpi	600 by 600 dpi	1,200 by 3,600 dpi	1,200 by 3,600 dpi
Substrate Weights	60 – 250 gsm	60 – 250 gsm	60 – 250 gsm	60 – 250 gsm	60 – 250 gsm	40 – 350 gsm	40 – 350 gsm	40 – 350 gsm
Toner type	Version 1	Version 2	Version 2	Version 3	Version 3	Version 3 or FA[11]	FA	PA
Availability date	1994	1997	1997	2000	2000	2004	2006	2008

Note: This table only includes a subset of all Xeikon duplex products.

There are more than 800 duplex Xeikon engine installations worldwide.

The Competitive Marketplace for Graphics Products

The Xeikon products fit in the 1 million to 10 million production color duty cycle category. This segment includes products from HP, Kodak, and Xerox. Digital production color devices have been around since the early 1990s when Indigo and Xeikon made their first product introductions. Most of the products in this category are sheet-fed, such as the Kodak NexPress and Xerox iGen3. HP Indigo has cut-sheet and roll-fed offerings. The most similar product offering to Xeikon's duplex products is HP Indigo's w3250. At 136 four-color ppm, it is significantly slower than the Xeikon 6000 and 8000. It slows down even further for fifth, sixth, or seventh colors. HP has announced a next-generation 240-ipm roll-fed product called the HP Indigo Press W7200 that will be available toward the end of 2009. Océ also has a new roll-fed offering, the ColorStream 10000.

Xeikon's Simplex Products for the Label & Flexible Packaging Market

The Xeikon 3300 was launched at drupa 2008. Not long after at Labelexpo Americas 2008, Xeikon launched another simplex product, the Xeikon 3000. The Xeikon 3000 is the entry-level complement to the Xeikon 3300. Both products are used for printing labels and flexible packaging in applications such as point-of-purchase displays, backlit signs, labels, stickers, shelf signage, posters, wallpaper, heat transfers, and packages of many types, including paperboard. The Table below compares the old Xeikon 330 with the new Xeikon 3300 and 3000 simplex offerings.

[11] Xeikon 5000 units in the field can be upgraded from Version 3 to the FA toner

Table 5: Comparing the Xeikon 330, 3000, and 3300

	Xeikon 330	Xeikon 3000	Xeikon 3300
Intro date	September 2004	September 2008	May 2008
Color capability	5/0 hardware configuration CMYK, and opaque white	5/0 hardware configuration CMYK, spot colors, opaque white or security toner	5/0 hardware configuration CMYK, spot colors, opaque white or security toner
Web speed	From 24 to 48 fpm (7.35 mpm to 14.7 mpm) depending on substrate	Up to 31.5 fpm for all substrates	Up to 63 fpm (19.2 mpm) Up to 31.5 fpm (9.6 mpm) on paperboard)
Web width	Supports widths from 12.6 to 13 inches (320 to 330 mm)	Supports widths from 7.9 to 13 inches (200 to 330 mm)	Supports widths from 7.9 to 13 inches (200 to 330 mm)
Print width	12.11 inches (307.6 mm)	12.7 inches (322 mm)	12.7 inches (322 mm)
Imaging addressability	600 by 600 dpi, 4-bit	1,200 by 3,600 dpi, 4-bit	1,200 by 3,600 dpi, 4-bit
Repeat length	Up to 180 feet (55 meters)	Up to 180 feet (55 meters)	Up to 180 feet (55 meters)
Substrates	60-250 gsm (40 lb text to 90 lb cover) Media caliper from 20 to 200 microns Paper, label stock, and synthetic media	40-350 gsm (27 lb text to 122 lb cover) Media caliper from 40 to 350 microns Self-adhesive labels (paper, polypropylene (PP), polyethylene terephthalate (PET), vinyl, co-extruded film), unsupported film, paperboard, and paper	40-350 gsm (27 lb text to 122 lb cover) Media caliper from 40 to 350 microns Self-adhesive labels (paper, polypropylene (PP), polyethylene terephthalate (PET), vinyl, co-extruded film), unsupported film, paperboard, and paper
Duty cycle	650,000 feet /month (200,000 meters/month	1,150,000 feet/month (1,400,000 meters/month)	2,300,000 feet/month (700,000 meters/month)
DFE	X-800	X-800	X-800
Toner	Version 3	FA	FA
Food packaging	Not approved	Approved for indirect food packaging with regular C,M, Y, and K toners Approved for direct food packaging when regular magenta is replaced with “extra” magenta	Approved for indirect food packaging with regular C,M, Y, and K toners Approved for direct food packaging when regular magenta is replaced with “extra” magenta
Pantone	No	Pantone-certified	Pantone-certified
Options	Rewinder Cutter In-line or off-line modular solutions for UV flexo varnish, high gloss or lamination, semi or full rotary die-cutting, slitting, matrix stripping, dual rewind, spot varnish, hot and cold foil, second die-cut and/or varnish station	Rewinder Cutter In-line or off-line modular solutions for UV flexo varnish, high gloss or lamination, semi or full rotary die-cutting, slitting, matrix stripping, dual rewind, spot varnish, hot and cold foil, second die-cut and/or varnish station	Rewinder Cutter In-line or off-line modular solutions for UV flexo varnish, high gloss or lamination, semi or full rotary die-cutting, slitting, matrix stripping, dual rewind, spot varnish, hot and cold foil, second die-cut and/or varnish station

A number of factors differentiate the Xeikon 3300 and 3000 from their predecessor, the Xeikon 330. These factors include higher imaging addressability, wider print width, support for a wider range of web widths, higher duty cycle, broader substrate support, and toner type. All of these improvements contribute to an increasingly strong market position for the Xeikon 3300 and 3000. Perhaps the most important improvement is the increased imaging addressability and the associated quality boost, which is receiving strong support from label and packaging experts. As noted earlier, the three key differentiators of the Xeikon 3300 and 3000 are speed, duty cycle, and price.

Xeikon Product History: Simplex

Starting in 1997 with the introduction of the DCP-32S, Xeikon began offering simplex products to focus on the label and flexible packaging markets. For a period of time, the company also offered wider products (around 20" web widths), including some for paperboard applications. Xeikon has since focused its efforts in this area on products with a maximum web width of 13 inches. The Table below underscores how speed, imaging addressability, duty cycle, substrate range, and toner technology have evolved over time.

Table 6: A View of Xeikon's Simplex Color Technology over Time

Product Name	DCP-32S	DCP-320S	Xeikon 330	Xeikon 3000	Xeikon 3300
Web width (inches and centimeters)	Up to 12.1" (307 mm)	12.6" to 13" (320 to 330 mm)	12.6" to 13" (320 to 330 mm)	7.9" to 13" (200 to 330 mm)	7.9" to 13" (200 to 330 mm)
Web speed (feet and meters per minute)	24 fpm (7.35 mpm)	24 fpm (7.35 mpm) or 48 fpm (14.7 mpm) depending upon the substrate	24 fpm (7.35 mpm) or 48 fpm (14.7 mpm) depending upon the substrate	31.5 fpm (9.6 mpm)	63 fpm (19.2 mpm)
Imaging addressability (dpi)	600 by 600	600 by 600	600 by 600	1,200 by 3,600	1,200 by 3,600
Duty cycle (feet/month)	280,000	600,000	650,000	1.15 million	2.3 million
Substrate weight	80 – 250 gsm	80 – 250 gsm	60 – 250 gsm	40 – 350 gsm	40 – 350 gsm
Toner type	Version 2	Version 2 & Version 3	Version 3	FA	FA
Availability date	1997	2002	2004	2008	2008

Note: This Table only includes a subset of all Xeikon simplex products

There are more than 150 simplex Xeikon engine installations worldwide.

The Competitive Marketplace for the Label and Flexible Packaging Markets

Compared to the graphics market, the digital print market for labels and flexible packaging is relatively new. In this segment, Xeikon and HP Indigo again compete. HP's current product is the HP Indigo ws4500, which runs at 52.5 feet per minute (16 meters per minute). At drupa 2008, HP announced a faster version, the HP Indigo WS6000, which is expected to begin shipping in early 2009. Other digital competitors in this market space (some with products now and some entering soon) include Agfa, EFI/Jetrion, Epson, MGI, Nilpeter, and Sun Chemical.

Xeikon's X-800 Front End

Xeikon's front ends have also undergone an evolution since the company's first product introductions in the early 1990s. One of the biggest breakthroughs was the introduction of the X-800 front end at drupa 2004. Today, all of Xeikon's new simplex and duplex units are shipped with the X-800 front end supported by software version 2.0.

The X-800 supports the printing of PostScript, PDF, PPML, and PPML/VDX files. Its PostScript/PDF capability is based on Adobe's Configurable PostScript Interpreter (CPSI). Optional IPDS support expands the PostScript/PDF capability of the front end for those environments (such as data centers and direct mailers) that require AFP/IPDS color workflows. The IPDS controller manages the bi-directional communication between the printer and the print server.

The X-800's standard color management tools include support for International Color Consortium (ICC) profiles and Pantone matching. The system supports CMYK as well as RGB workflows. The X-800 front end is also designed to support product features such as the fifth color capability, the higher speed, and the increased imaging addressability. Xeikon has taken an open architecture and standards-based approach with the X-800 that includes support for JDF, OPI, and XML.[12]

A multi-threaded software design enables the X-800 to take advantage of multiple processors in a single system. One or more off-line raster image processor (RIP) platforms can be added where additional processing power is needed. Intelligent load balancing techniques are used to divide the print job (or print jobs) over the system's multiple processors or RIPs. Parallel RIPing and compression are also used to accelerate the process. A RIP-while-printing feature offers improved productivity. An object-based computing strategy provides additional capabilities such as post-RIP imposition that allows for last-minute corrections as well as the ability to reuse components of already RIPed jobs. The X-800's ability to split prepress and production tasks enables a logical division of labor where desired.

The X-800 includes a Structured Query Language (SQL) database that is used to gather production-related information from the print engine and the front end. This data can be integrated with print management information systems (MIS) for analysis and monitoring of production processes. Another feature is an embedded device relationship management solution that facilitates remote service monitoring of the print engine.

In addition to the IPDS controller and off-line RIP options, other optional modules include Ultimate Technographics' Impress imposition, in-RIP trapping, JDF imposition templates, bar-coding, and a Kanji font set. The X-800 is available as a "streamer" system based on a high-end Intel-based workstation. A server-based version for offline purposes is also available.

[12] JDF stands for job definition format. This has implications for standards-based automated workflow. OPI stands for Open Pre-Press Interface. OPI is an image-replacement method that uses small placeholder images for layout. These are replaced with high-resolution images upon output. XML stands for eXtensible Markup Language. It is a common format for data exchange and is used by the X-800 for job ticketing.

Xeikon's Market Positioning

Based on the speeds, duty cycle, and substrate weight handling capabilities, Table 7 shows how Xeikon positions its products in the major market segments that it serves.

Table 7: Xeikon Product Positioning

	Xeikon 8000	Xeikon 6000	Xeikon 5000plus	Xeikon 4000	Xeikon 3300/3000
General Commercial	✓✓	✓✓✓	✓✓✓	✓✓✓	NA
Transactional	✓✓✓	✓✓	✓✓	✓	NA
TransPromo/DM[13]	✓✓✓	✓✓	✓✓	✓	NA
Book publishing	✓✓✓	✓✓	✓✓	✓	NA
Photofinishing	✓✓	✓✓✓	✓✓	NA	NA
Label/packaging	✓	✓	✓	NA	✓✓✓
Industrial printing	✓	✓	✓✓	NA	✓✓✓

Source: Xeikon

For all of its products, Xeikon identifies three main value propositions—productivity, image quality, and environmental sustainability. As can be seen from this review of Xeikon's 2008 technology developments, Xeikon has made advancements in all of these areas with speed increases, its new 1,200 by 3,600 image addressability, easy recyclability of its product packaging, and toner-based output.

Xeikon by Punch Graphix

Prior to its 2002 acquisition by Punch International, Xeikon operated as an independent company. This section provides some background on Xeikon, Punch International, and the Punch Graphix group.

Xeikon's Company History

Xeikon was founded by Lucien De Schamphelaere, a 40-year Agfa-Gevaert veteran, who had become convinced that digital technology could be adapted to production color printing. He left Agfa in 1988 to set up Xeikon, which began its existence in Mortsel, Belgium near Antwerp. With support from investors including Agfa, Xeikon began beta testing the first prototypes of the DCP-1 in 1993 and announced the product publicly at IPEX later that year. The company began shipping its DCP-1 in April of 1994. Response to the product was strong and Xeikon grew. By 1997, the company had more than 300 employees. In 1999, Xeikon acquired an 80% interest in Nipson, a French provider of monochrome continuous feed printing systems.

Throughout this early portion of Xeikon's history, the company pursued a strategy of selling branded Xeikon products while also pursuing OEM and distribution partnerships with a range of well-known companies. Xeikon partners during this period included Agfa, AM Multigraphics, Barco Graphics, IBM Printing Systems, MAN Roland, Nilpeter, Océ, PrimeSource, and Xerox. After being acquired by Punch International, Xeikon moved away from its OEM strategy and adopted a focused sales and product strategy to leverage the unique technological capabilities of its products in selected market segments. As part of this

[13] Direct mail/direct marketing

initiative, Xeikon moved to a direct sales strategy in 2002 and began strengthening its own sales organizations worldwide. In addition, it sold the Nipson unit late in 2002 to focus on its digital color technology business. With financial support and management guidance from Punch International, Xeikon has become an important revenue and profit contributor in the organization. Total revenues generated by the sales of Xeikon systems in 2007 worldwide were 114 million euro (or approximately US $171 million).

The company's headquarters are currently located in Lier, Belgium, not far from the company's original starting point in Mortsel. Punch Graphix, the parent company of Xeikon, has more than 700 employees worldwide. The Lier facility, completed in 2002, houses Xeikon's international headquarters and all research activities. It handles the production of LED imaging heads as well as final product assembly. Toner manufacturing is managed at a separate Xeikon-owned site in Heultje, Belgium, about 25 kilometers from the company headquarters.

About Punch International and Punch Graphix

Founded in 1982, Punch International is an industrial holding company whose stated goal is to "achieve long-term capital growth by acquiring majority stakes in a varied portfolio of companies with a view to unlocking implicit value." Stated another way, Punch International seeks to purchase companies with strong technologies and provides them with the stability and support of a larger company. Punch International is a public company with 2007 sales of 331.7 million euro and a net profit of 28.5 million euro. The company currently operates three main divisions:

- **Automotive (Punch Motive):** Punch Motive is a conglomeration of all of the automotive-related activities undertaken by Punch International. Formed in 2004, it provides design, engineering, manufacturing, and program management services. Punch Motive has its headquarters in Belgium, production plants in Germany, and a sales office in the United States. Divisions include BBS, Punch Metals, Punch PlastX, and Punch Powertrain. Punch Motive services include the development and production of lightweight wheels for premium sports and passenger cars; price-competitive manufacturing solutions for the automotive industry; and the design, manufacture, and supply of continuously variable transmissions (CVTs) and hybrid powertrains for car manufacturers.
- **Graphics (Punch Graphix):** Punch International formed the foundation for the Punch Graphix group in January 2000 with the purchase of Strobbe Graphics. In April 2002, Punch International acquired Xeikon. In July 2004, Punch International acquired basysPrint. In March 2005, the Punch Graphix group was incorporated as Punch Graphix plc. Punch Graphix is a very important component of Punch International, accounting for 184.9 million euro (about 56%) of the company's 2007 sales. Punch Graphix includes Xeikon and basysPrint, a supplier of prepress equipment and software for the commercial and newspaper printing industries. basysPrint products (including platesetters) are sold under the basysPrint brand as well as under OEM contract to others. Strobbe, which manufactured computer-to-plate devices for the newspaper industry, is now part of basysPrint. The Strobbe-based devices are sold by Agfa under the names of Advantage and Polaris. For the commercial print market, basysPrint has specialized in platesetting solutions using UV-sensitive plate technology. basysPrint reports that it has an installed base of several hundred UV-Setters worldwide.
- **Transport Management (Punch Telematix):** Punch Telematix develops and markets transport management solutions for companies in the truck & transport sector. Punch Telematix solutions

include on-board computers, wireless communication services, and Web-based back-office applications. Based in Belgium, Punch Telematix also has offices in The Netherlands, France, Germany, and Spain. Its distribution is extended via value-added resellers.

In addition to its three main divisions, Punch International has some other activities that are not large enough to warrant their own division. Two examples of this include SpaceChecker, a Belgian telematics company that specializes in satellite navigation (acquired in February of 2006), and the machine building and engineering activities of Punch Technix Equipment Manufacturing.

Xeikon Customer Profile: Odyssey Digital Printing in Tulsa, Oklahoma

Odyssey Digital Printing (www.odysseyprint.com) in Tulsa, Oklahoma provides an intriguing example of a Xeikon customer. According to President and Co-Founder John Roberds, the bulk of Odyssey Digital Printing's business is in point-of-purchase graphics, but the company also produces a fair amount of other applications such as short-run packaging and newsletters. To meet customers' needs, Odyssey Digital Printing has used a combination of equipment, including Xeikon simplex and duplex devices. Over a period of more than ten years, Odyssey Digital Printing has grown from a start-up to a 55-employee company that serves some of the best-known brands in the business. Odyssey Digital Printing's client list includes well-known restaurant chains, sporting goods manufacturers, and retail stores. Today, Odyssey Digital Printing has three Xeikon devices—a 5000, a 50D, and a 50SP. It also has a Xeikon 3300 that was recently installed.

Founded by John Roberds and Jan Fairless, Odyssey Digital Printing's 33,000-square-foot facility provides a showcase of digital print technologies. Odyssey Digital Printing began its operations in 1996 with one employee and a narrow-format duplex Xeikon device. Roberds admits that early on, the company did not have the application focus that it has today. "Basically, we would print anything that people would pay us to print." That began to change when Odyssey Digital Printing added wide-format inkjet and electrostatic printers. In the 1990s, the company expanded its short-run, quick turnaround printing capability with the purchase of two Heidelberg Quickmaster DI presses. (These have since been replaced by a single Presstek 52DI.) By 2002, Odyssey Digital Printing had acquired a Xeikon 50D, and it obtained a 50SP not long after that. This equipment list underlines Odyssey Digital Printing's focus on quick turnaround short-run digital print, large-format graphics, and highly automated offset print via direct-to-press technologies.

Odyssey Digital Printing's simplex and duplex Xeikon equipment is particularly well-suited for point-of-purchase applications such as displays, backlit signs, labels, stickers, and shelf signage. This can be partly attributed to the devices' roll-fed format, which enables very long images. Of course, the simplex Xeikon 50SP and the new Xeikon 3300 are designed for flexible packaging applications, but Odyssey Digital Printing also makes good use of its 5000 and 50D for point-of-purchase displays. An interesting case in point for Xeikon's duplex technology relates to backlit signs. The accurate front-to-back registration makes it possible for Odyssey Digital Printing to back up the image on the front with an identical mirror print of the same image on the back. Why would this be necessary? Backlit signs are viewed in many different lighting conditions. When lit from behind, it is important that the image does not appear washed out. For this reason, traditional methods of producing backlit signs generally print the image at higher densities than normal. The drawback of this technique is that images produced this way appear dark and muddy when viewed in daylight. With Xeikon's ability to print identical images

on both sides of the substrate simultaneously, Odyssey Digital Printing is able to produce a backlit graphic that looks good in daylight and at night.

Figure 9: Odyssey Digital Printing

The fifth color station of Odyssey Digital Printing's Xeikon devices provides another advantage versus the traditional screen and lithographic methods of producing point-of-purchase or packaging applications. Beyond the obvious ability of Odyssey Digital Printing's Xeikon machines to produce economic short runs with quick turnaround times, the fifth color station offers abilities that are more typical of traditional methods. For example, brand colors are generally printed as solids rather than as percentage mixes of the cyan, magenta, yellow, and black process colors. This sets a level of expectation that makes it harder for digital methods to please buyers of point-of-purchase graphics. At its simplest, the fifth station can be used to print white on a clear substrate (sometimes on the back) so that the label can be easily read over any background. Using Xeikon's Form Adapted (FA) toner, Odyssey Digital Printing is also working to produce certain colors, such as bright orange, that had previously been difficult to match. This raises another important issue. Point-of-purchase graphics are typically produced on print technologies ranging from wide format inkjet to toner-based digital to offset, flexographic, or screen inks. Odyssey Digital Printing not only needs to match its range of internal technologies, but it also has to closely match output from traditional methods produced by other vendors. The fifth station provides the ability to print solid spot colors while also expanding the color gamut for certain applications.

Advanced print quality is one of the reasons that Roberds is so excited about the new Xeikon 3300. He believes that the product will be market-changing. He states that its 1,200 dpi print head provides better halftones and a sharper, crisper image. While he is pleased with the current quality levels of the 50SP, the 3300 will allow Odyssey Digital Printing to achieve previously unreached levels of quality. Early testing with the 3300 has impressed some of Odyssey Digital Printing's most demanding customers. Roberds views the product as "a real step forward that we felt was necessary for the packaging market."

Advances in finishing technologies have also worked hand in hand with digital print technologies to make certain packaging applications feasible for short runs. For example, diecutting has been an area where long change-over times and difficulty in aligning dies to the printed piece have made it difficult for print service providers to offer short run digital services. For several years now, Odyssey Digital Printing has used a Preco diecutting system with optical registration that allows die changes in approximately two minutes. Older systems required half an hour to change dies and re-align the system.

While packaging is an important and growing part of Odyssey Digital Printing's business, approximately 80% of its sales come from point-of-purchase graphics. Odyssey Digital Printing's Xeikon equipment is central to its success. About half of the company's total sales are driven by its Xeikon equipment.

Odyssey Digital Printing's team of five salespeople goes after medium-sized companies with point-of-purchase and other requirements that often involve kitting for retail chains or chain franchises. This is generally the case for companies that have 25 to 1,000 locations. Odyssey Digital Printing's customers want quality and a professional look that rivals their largest competitors. Kitting is an integral part of what these companies need. On a monthly basis (or more frequently if necessary), Odyssey Digital Printing will create kits for each location. A typical kit might include a variety of signs (including backlit ones), stickers, counter cards, labels, decals, posters, and menus. These are shipped directly to the store and generally reflect local requirements, such as pricing. The versioning of these elements and the fulfillment of the kits is a big part of Odyssey Digital Printing's overall value proposition.

Although templates can be used to simplify production, Roberds said that he views all jobs as custom. Customers may produce the same sign month in and month out, but the varying details make it difficult to streamline. Odyssey Digital Printing does automate where possible and has been impressed with Xeikon's X-800 front end system, which Roberds described as powerful and invaluable for its step and repeat feature.

From its modest beginnings in 1996, Odyssey Digital Printing has become a leader in digital print through its focus on meeting customers' needs with a wide range of technologies. Producing prints as small as business cards and as large as billboards, Odyssey Digital Printing has grown into a master in the art of point-of-purchase, packaging, and other short-run applications that are produced digitally. The Xeikon products have been central to Odyssey Digital Printing's past success, and the future looks bright as the next-generation Xeikon 3300 joins the mix and builds a foundation for new opportunities in label printing and packaging.

Conclusion

Xeikon's 2008 technology announcements build on a strong history of platform developments, new toner formulations, and a dedication to productivity and ecological friendliness. Xeikon has shown that image quality does not need to be sacrificed at the expense of speed and productivity. As new web-fed inkjet products gain acclaim and enter the marketplace, print service providers would do well to consider Xeikon's long history in the market and its commitment to productivity, image quality, and environmental sustainability.