High-Speed Monochrome and Color Inkjet in Hybrid Configurations
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Executive Summary

Hybrid press or finishing systems can now be equipped with high-speed and high-quality inkjet modules that enable production of a wide range of print applications. These modules, exemplified by Kodak's Prosper S Series Imprinting Systems, have recently added process color capability, which has opened up new opportunities for hybrid printing systems.

Key Findings

Key findings of this analysis include:

- Inkjet print speeds and quality levels have risen to the point where they can be used effectively in-line with offset web presses and other high-speed systems, such as finishing lines.

- A hybrid configuration can offer the manufacturing cost benefits of offset printing with the personalization capabilities of digital printing.

- Monochrome and spot color inkjet modules have laid the foundation for high-speed inkjet configurations and now process color modules are extending the application set possible within these hybrid systems.

- Innovative print service providers are finding new ways to add value and streamline processes using hybrid systems.

Recommendations

InfoTrends makes the following recommendations:

- Print service providers can leverage existing web offset press assets through the use of on-press inkjet modules, thereby extending the value of their existing capital investments.

- Hybrid offset/inkjet configurations can meet client demands for color variable data at volume levels that are not feasible today with toner-based systems.

- Designers creating layouts for hybrid configurations need to take into account constraints such as the available width of the heads and the placement of stitch lines.

- Though much of the appeal of digital print resides in highly variable, personalized applications, end users should not overlook other inventive uses of on-press inkjet, including versioning, which can be facilitated through inkjet, thereby avoiding press-stopping black plate changes.

- Do not overlook the potential use of inkjet heads mounted on devices other than a printing press (such as an inserter or other finishing line).
Introduction

There is a great change underway in the printing market as high-speed monochrome, spot, and process color inkjet technologies are applied in hybrid on-press and standalone production system configurations. In this document, InfoTrends investigates the on-press opportunities presented by these technologies, using Kodak’s new Prosper S Series Imprinting Systems as an example. This white paper builds on an earlier InfoTrends analysis that was published under the title Opportunities for High-Speed Monochrome and Color Inkjet Mounted on Offset Web Presses. It has been expanded and updated to include more about the process color implications of on-press inkjet printing, including examples that demonstrate how the technology is being used.

The Production Digital Print Market

The production digital print market has been dominated to date by standalone toner-based monochrome and color systems. Toner also dominates two-part processes involving the use of offset-printed shells. With this type of workflow, static information (such as color graphics and logos) is pre-printed on rolls or sheets of paper by an offset press, and a monochrome digital component is added or “lasered” by a toner-based continuous-feed or cut-sheet printer afterward.

Toner’s dominance in standalone digital and offset shell workflows has been challenged by inkjet. Over the past few years, inkjet technologies have greatly improved in terms of print resolution, speed, and the ability to print on a range of substrates. Much of the attention to date in the production market has been focused on high-speed web-fed production color inkjet systems. It has become apparent, however, that on-press use of high-speed monochrome and color inkjet technologies brings some remarkable advantages to a variety of print applications.

Mounting inkjet heads on web-fed offset presses and finishing lines is not new. Commercial printers and direct mailers have been using high-speed and low resolution monochrome inkjet heads for many years. Nevertheless, as quality and speed have increased, the range of applications has grown, as well. No longer are end users limited to low-resolution text and graphics.

The purpose of this updated white paper is to explore this growing area and the advantages that come from hybrid configurations that can leverage high quality text and images in process color.
Reasons to Use a Hybrid Approach

There are many reasons why a print service provider would consider a hybrid inkjet/offset approach.

Offset versus Digital

Offset can do some things that digital cannot. Today’s high-speed digital systems, whether inkjet or toner, are generally not able to produce some special effects that offset is capable of (e.g., printing metallic or fluorescent colors). Using a hybrid approach allows end users to take advantage of these special effects while also gaining the benefit of targeted or variable messaging and graphics.

Strength of Each Technology

One of the main reasons for creating a hybrid system is to take advantage of the unique strengths of the two technologies. Offset printing is a very cost-effective method of reproducing large quantities of static documents. Digital printing can provide variable data for addressing, personalized messaging, coding, localized elements (such as maps and phone numbers), and targeted or personalized graphics. With recent inkjet advances, it can also provide these things at high speed, at reasonable cost, in high quality, and in color.

Higher Resolutions Lead to Wide Format

Higher resolution is opening up wider format opportunities. The use of narrow-format monochrome inkjet heads has been a staple of on-press and mailing line applications, but this has been limited to addressing, coding, and smaller personalized elements. The move to 600 dot-per-inch (dpi) resolution, combined with the ability to stitch heads together to go wider than 4 inches, is making print service providers (PSPs) consider using inkjet heads in hybrid configurations for variable applications that require higher quality on larger areas of the page. It also opens up the opportunity to move from a two-step process of web offset print and then toner-based laser imprinting to a single-step process using inkjet heads on-press.

Full Process Color

Full process color is here. Kodak has commercial monochrome, spot, and now process color inkjet offerings that are opening up new hybrid opportunities because of their speed, quality, cost, and their ability to handle wider print areas. In the same way that 600 dpi quality at high speed has driven the opportunity for the monochrome and spot color Prosper S Series Imprinting Systems, the ability to print high quality process color at high speed is eliminating the need for pre-printed offset shells and enabling new print applications.
Personalization
The move toward mobile communication devices has heightened consumers’ expectations for information that is relevant to them and available on demand. Digital systems provide that capability in print, yet the running cost of toner-based systems has limited their broad application. Inkjet systems, in hybrid or standalone configurations, can provide high-volume, variable print with very favorable cost metrics.

Simplified Versioning
Full variable data is not the only application of hybrid inkjet technologies. Versioned documents are another important application. In the case of monochrome, having inkjet heads on the press eliminates the need for frequent black plate changes. The productivity hit and the plate cost implications can make a strong case for the use of inkjet for versioning in targeted, segmented, or regulatory applications. These, in essence, are multiple short run versions of the same document with some text or graphic changes.

Setting the Stage
Some key factors and definitions are important in understanding the opportunity for inkjet technologies in on-press and other hybrid applications. We will start with a definition of hybrid and a look at the implications of cost before we go into the details about the technology and how it is being applied.

A Definition of “Hybrid”
InfoTrends uses the term “hybrid” to describe configurations that make use of at least two printing or mailing technologies in a single system. The two hybrid configurations that are relevant to this document are:

- **On-press inkjet**: This generally involves the use of one or more inkjet heads mounted on a web-fed offset press, although it is also possible for inkjet to be used in conjunction with a sheet-fed offset press. Hybrid configurations with other press types, such as gravure or flexography, are also possible.

- **Inkjet integrated into a mailing or finishing line**: One or more inkjet heads may also be mounted in a mailing or finishing line. This may be in a roll-fed or sheet-fed configuration, but ultimately the job will be sheeted for insertion and mailing.

The use of a single head versus two or more heads is another interesting differentiator in hybrid applications. As a general rule, one head is used for single field areas, such as codes or addresses, while multiple head implementations typically are used for handling full documents or larger document sub-segments.

In addition, end users are very creative in how they apply new technologies. Users may be aware of other ways that companies are taking advantage of inkjet. Therefore, the definition of “hybrid” is flexible and will likely expand to include other applications over time. For example, inkjet is used on-press for coding and dating applications in packaging, and the use of inkjet in more graphically-sophisticated packaging applications is sure to increase with quality improvements.
Cost, Speed, and Quality Implications for Digital Print

The cost of digital print, particularly color digital print, has been a limiting factor to its broad adoption. Yet there has been an ongoing drop in the cost of color digital print, and InfoTrends expects this trend to continue for color toner products and to be driven even lower for high-speed continuous-feed color inkjet products. There is little or no room, however, to move the cost of monochrome toner products significantly lower. Yet there are productivity and cost advantages to be gained by using digital products (chiefly inkjet) in on-press configurations with web offset presses.

Figure 1 describes the current market landscape of digital color systems in a view of quality and speed. Digital color print quality ranges from a high level of graphic arts quality, as exemplified by cut-sheet toner-based copiers and printers. Speed of the toner-based cut-sheet color class of devices tops out today at around 130 letter pages per minute, although pairing or clustering multiple print engines together can expand this further. In general, however, InfoTrends does not expect toner-based cut-sheet color speeds to increase much beyond 130 ppm on a per-engine basis. Also at a very high level of quality are toner-based continuous-feed color products. Though these devices are faster than their cut-sheet brethren, their speed is only moderately faster with the top-of-the-line models capable of about 240 letter size pages per minute. At a lower level of quality, but at impressive speed and acquisition price points, are a small number of inkjet cut-sheet devices. With print speeds of up to 150 letter-size pages per minute and acquisition costs comparable to office multi-function copier/printers, this is a category to watch, particularly in light of 4-up product offerings. High-speed continuous-feed color products (like Kodak’s Prosper 5000XL) are a growing category that is driving new opportunities. Although there are some toner-based products at this high level of speed, almost all of these products are inkjet.
As indicated by the blue arrow in Figure 1, expanded ability to print on coated stocks is opening up new applications for inkjet. This raises their ability to print at high quality and makes higher volume variable applications a reality. Today, the high-speed continuous-feed color products tend to focus on transaction documents (like bills and statements), direct mail, and books. As costs drop, new opportunities will be possible in higher volume applications like catalogs, custom publications, magazines, newspapers, and personalized promotional materials. This makes these new high-speed continuous-feed color systems more competitive with traditional methods at higher run lengths, but there is also an opportunity for hybrid systems to take digital into new territory.

As discussed above, cost is a barrier to broad implementation of digital printing systems. High-speed inkjet systems are lowering that barrier, yet there is one solution that leverages the cost metrics of offset while also taking advantages of the variable data capability of digital print. To explore the possibilities of hybrid solutions, we first need to understand the capabilities of the technology. We will look at Kodak’s Prosper S Series Imprinting Systems in detail since they provide a good example of how inkjet heads are being used in hybrid configurations on press.
About Kodak’s Prosper Hybrid Printing Solutions

Kodak’s Prosper printing systems are based on a Kodak inkjet head technology called “Stream.” Kodak has rolled out its Stream inkjet technology in hybrid configurations and standalone system configurations under the brand “Prosper.” The first available products were the Prosper S5 and S10 Imprinting Systems, which are configured as hybrid on-press configurations. The next announced product, which became available in 2011, was the Prosper Color 5000XL Press. Kodak also announced a monochrome system called the Prosper 1000 Press around the same time. The Prosper Color 5000XL Press and the Prosper 1000 Press are standalone systems. Next Kodak announced a faster S Series model, the S20. In the days leading to drupa 2012, Kodak announced the fastest model yet, the 3,000 feet per minute S30. At this time, Kodak also added process color to the S Series “with CMYK” models.

Another Kodak initiative that leverages the Stream inkjet head technology is a third-party partner program. Products that result from these partnerships do not carry the Prosper brand, but do allow companies to take advantage of the benefits of Stream inkjet technology. Publicly announced partnerships include one with the offset press manufacturer Ryobi and another with the book press manufacturer Timsons.

All of Kodak’s Prosper offerings make use of some of the same underlying Stream printhead technology. Kodak announced the Prosper branding for Stream in 2009 and is using that term for all products based on these heads. Prosper S Series Imprinting Systems use inkjet heads that are 4.16 inches (10.4 cm) wide. The controller can support up to 24 heads for a possible width of close to 100 inches, but in practice typically four heads are stitched together in a single line for a 16.64 inch width. Each inkjet head has 2,560 nozzles, which supports the 600 dpi resolution. During operation, each of these tiny nozzles (10 micron diameter aperture) has a constant stream of aqueous (i.e., water-based) ink flowing through it.

All Prosper inks are water-based (i.e., aqueous). The black ink for the Prosper S Series Imprinting Systems uses pigments (rather than dyes), which contributes to its fade, scratch, and water resistance. Like the Prosper 5000XL, the Prosper S Series heads for on-press hybrid process color use pigmented cyan, magenta, yellow, and black (CMYK) inks. A lower cost black dye ink for the Prosper S Series Imprinting Systems is also available, but it does not have the fade, scratch, and water resistance of the pigment version, nor is it able to print on the range of paper stocks that the pigment ink supports. Dye-based spot color inks are also available. Announced in 2009, Kodak’s Prosper Spot Color Matching Service gives print service providers the ability to match specific logo or brand colors for their clients.
About the Prosper S Series Imprinting Systems

The Table below summarizes the Prosper S Series Imprinting Systems and compares them to Kodak’s Versamark DS6240 Printing System, which preceded Stream inkjet technology to the market by about nine years.

Table 1: Comparing the Specifications of the Prosper S Series and the Versamark DS6240

<table>
<thead>
<tr>
<th>Specification</th>
<th>S30</th>
<th>S20</th>
<th>S10</th>
<th>S5</th>
<th>DS6240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full product name</td>
<td>Kodak Prosper S30 Imprinting System</td>
<td>Kodak Prosper S20 Imprinting System</td>
<td>Kodak Prosper S10 Imprinting System</td>
<td>Kodak Prosper S5 Imprinting System</td>
<td>Kodak Versamark DS6240 Printing System</td>
</tr>
<tr>
<td>Technology type</td>
<td>Continuous inkjet</td>
<td>Continuous inkjet</td>
<td>Continuous inkjet</td>
<td>Continuous inkjet</td>
<td>Continuous inkjet</td>
</tr>
<tr>
<td>Rated speed(^1)</td>
<td>3,000 fpm 915 mpm</td>
<td>2,000 fpm 610 mpm</td>
<td>1,000 fpm 305 mpm</td>
<td>500 fpm 152 mpm</td>
<td>300, 500, or 1,000 fpm 90, 152, or 305 mpm(^2)</td>
</tr>
<tr>
<td>Resolution</td>
<td>600 x 200 dpi</td>
<td>600 x 300 dpi</td>
<td>600 x 600 dpi</td>
<td>600 x 600 dpi</td>
<td>240 x 240 dpi</td>
</tr>
<tr>
<td>Print width</td>
<td>10.56 cm (4.16 inches)</td>
<td>10.56 cm (4.16 inches)</td>
<td>10.56 cm (4.16 inches)</td>
<td>10.56 cm (4.16 inches)</td>
<td>10.84 cm (4.27 inches)</td>
</tr>
<tr>
<td>Ink type</td>
<td>Aqueous pigment (black, process color)</td>
<td>Aqueous pigment (black, process color)</td>
<td>Aqueous pigment (black, process color)</td>
<td>Aqueous pigment (black, process color)</td>
<td>Aqueous dye (black &amp; spot color)</td>
</tr>
<tr>
<td>List price (USD $)(^4)</td>
<td>$428,500</td>
<td>$376,500</td>
<td>$337,500</td>
<td>$267,500</td>
<td>$198,000 (300 fpm) $278,000 (500 fpm) $343,000 (1,000 fpm)</td>
</tr>
<tr>
<td>Stitching</td>
<td>Can stitch up to four heads for a total print width of 16.64 in. (41.6 cm)</td>
<td>Can stitch up to four heads for a total print width of 16.64 in. (41.6 cm)</td>
<td>Can stitch up to four heads for a total print width of 16.64 in. (41.6 cm)</td>
<td>Can stitch up to four heads for a total print width of 16.64 in. (41.6 cm)</td>
<td>Can stitch up to four heads for a total print width of 17.08 in. (43.4 cm)</td>
</tr>
<tr>
<td>Mounting</td>
<td>DC3700 printhead carriage DC3800 printhead carriage</td>
<td>DC3700 printhead carriage DC3800 printhead carriage</td>
<td>DC3700 printhead carriage DC3800 printhead carriage</td>
<td>DC3700 printhead carriage DC3800 printhead carriage S5 mail-based mount</td>
<td>DC3700 printhead carriage DS6240 mail-based mount</td>
</tr>
</tbody>
</table>

\(^1\) fpm = feet per minute; mpm = meters per minute  
\(^2\) The three speeds represent three models of the DS6240.  
\(^3\) Process color will be available initially as a custom integration for S30.  
\(^4\) The list price includes a two-headed system with fluid stations and CS410 controller.
As seen from the Table, the members of the S Series family are differentiated by speed. This is the logic behind the product naming (S5 = 500 feet per minute). At the high end of the line, the S30 is the fastest, offering speeds of up to 3,000 feet per minute. In attaining this speed, the trade-off is in resolution, which is 600 by 200 dpi. The S20 offers speeds of up to 2,000 feet per minute at 600 by 300 dpi. The S5 (500 fpm) and S10 (1,000 fpm) are 600 by 600 dpi. What separates the S Series products from the DS6240 is resolution. At up to 600 by 600 dpi, the S Series products outpace the DS6240’s 240 by 240 dpi. List price is also an important differentiator. As would be expected, there is a price to pay for higher speed and resolution. In addition, though Kodak will continue to sell the DS6240, it has aggressively priced the lower end of the S Series line to drive customers toward those products. For those looking for process color capability, the S5, S10, and S20 are the models that have the “with CMYK” support. The S30 initially will be available to support CMYK as a custom integration.

The specifications also help determine the target markets and applications. Kodak notes that the S Series is designed for publication market applications, such as commercial inserts, versioned ads in magazines and newspapers, as well as commercial direct marketing. For the DS6240, the markets are aimed toward variable data imprinting for personalization, graphics, addressing, barcoding, numbering, and logos in markets such as commercial printing, direct mail, forms, packaging, ticket, tag and label, as well as transactional printing.

**Going Wider: Stitching Multiple Inkjet Heads Together**

Aligning multiple inkjet heads together to gain a wider print area is referred to as “stitching.” This can be achieved in three levels that speak to the way data is provided to the heads and the level of accuracy associated with the “stitch”:

- **Mechanical stitching:** With this type of stitching, the heads are aligned and overlapped, but not to an extremely high level of accuracy. In the output from a pair of mechanically stitched heads, there will likely be a visible print artifact where the edges of the heads' print areas come together. This is often referred to as a “stitch line.”

- **Electronic stitching:** This type of stitching has less to do with the placement of the heads and more to do with how the controller splits images between multiple heads. In the case of electronic stitching, the system responsible for image processing takes a single image and splits it across multiple printheads.

- **Seamless stitching:** Seamless stitching elevates the accuracy with which the printheads are aligned to the point where there is no visible stitch line between the adjacent heads. Seamless stitching is a defining aspect of Kodak’s Prosper 5000XL Press and 1000 Press standalone systems.

For applications using multiple printheads in non-adjacent areas of the paper web, stitching is not an issue. Stitching only becomes relevant when image areas from multiple heads print right next to each other and the adjacent image components must align for the execution of the design.
Mechanical stitching imposes some basic limitations to keep the stitch line from interfering with the design. One common workaround in applications, such as direct mail, is to orient the page so that the stitch line falls between two lines of text. Stitch lines also impose a maximum height or width on any graphic used, though many will easily fit within the 4.16-inch width of the Stream printheads.

### Table 2: Stitching on the Prosper Systems

<table>
<thead>
<tr>
<th>Product</th>
<th>Mechanical</th>
<th>Electronic</th>
<th>Seamless</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosper Series Imprinting Systems</td>
<td>Yes</td>
<td>Yes(^5)</td>
<td>No</td>
<td>Designers must choose to place the stitch line judiciously</td>
</tr>
<tr>
<td>Prosper 5000XL Press and 1000 Press</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>There is no need to design around stitch lines</td>
</tr>
</tbody>
</table>

Mechanical and seamless stitching are key to the difference between the Prosper S Series and the Prosper 5000XL Press/1000 Press. Both systems require electronic stitching, but seamless stitching is a standard feature of the Prosper 5000XL Press and 1000 Press systems.

**Mounting the Inkjet Heads on the Press**

One of the basic questions about the use of hybrid inkjet technology is “How do you put it on the press?” The answer is fairly straight-forward. Mounting systems have been developed for previous generations of technology and are equally suitable for the Prosper S Series.

Figure 2 shows a close-up of a Kodak Versamark DC3800 two-rail mounting system capable of supporting eight printheads. The inkjet heads are not shown in Figure 2, though the row of four “buckets” used to hold them are visible across the right hand side at the front of the system above the controller screen. The first bucket in a similar row of four buckets can just be seen between the two orange handles. The two C-shaped devices at the top of the system on each rail are designed to hold and protect the cords and tubing for the electric and ink fluid systems. The red button by the controller screen provides an emergency stop function.

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\(^5\) Only required for multiple head systems
Figure 2: Kodak Versamark DC3800 8-Head 2-Rail Printhead Carriage System

Figure 3 takes us to the next step, showing how the heads are mounted on an actual press. This example comes from drupa 2008, when Kodak showed the S10 heads (then known as the “Stream Concept Printhead”) mounted on a Muller Martini web offset press.

Figure 3: Kodak Stream Concept Printheads Mounted on a Muller Martini Press

In Figure 3, the printhead carriage system is also a DC3800, but in this case it is a two-rail system with four printheads (two are plainly visible with the corner of the third unit behind them). The electrical cords and ink fluid tubing can be seen directly above the printheads. The far end of the press is where the roll feed resides. It is followed by four print units. The DC3800 printhead carriage sits on top of a drying tower for the offset press. The paper web continues to a finishing unit and conveyor.
Strengths, Weaknesses, Opportunities, and Threats

When looking at products like Kodak’s Prosper S Series Imprinting Systems, InfoTrends discerns the product’s strengths, weaknesses, opportunities, and threats (SWOT). These factors are summarized in Table 3.

Table 3: SWOT Analysis of the Prosper S Series Imprinting Systems

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Speed (up to 3,000 feet per minute/915 meters per minute)</td>
<td>• Stitched arrays (those who want no visible stitching will be candidates for the standalone monochrome or process color Prosper systems)</td>
</tr>
<tr>
<td>• Up to 600 dpi resolution</td>
<td>• The width of the Stream printhead is slightly narrower than the DS6240 head</td>
</tr>
<tr>
<td>• 170 line per inch halftone equivalent</td>
<td>• Limitations around the use of substrates</td>
</tr>
<tr>
<td>• Durable pigment black and process color inks</td>
<td></td>
</tr>
<tr>
<td>• Ability to stitch heads for wider print area</td>
<td></td>
</tr>
<tr>
<td>• Flexibility for on-press or mail/finishing line use</td>
<td></td>
</tr>
<tr>
<td>• Spot color matching</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Leveraging inkjet personalization at web offset press speeds</td>
<td>• Expanding range of competitive hybrid offerings</td>
</tr>
<tr>
<td>• Expanded application set made possible by 600 dpi resolution inkjet at high speed in monochrome, spot, or process color</td>
<td>• Competition from monochrome and color inkjet systems</td>
</tr>
<tr>
<td>• Full variable data and versioned applications</td>
<td>• Electronic delivery of variable personalized information</td>
</tr>
<tr>
<td>• Applications previously handled by black plate changes on an offset press</td>
<td></td>
</tr>
<tr>
<td>• Logo and corporate branding applications using matched spot colors</td>
<td></td>
</tr>
<tr>
<td>• Exchanging a two-step process (offset pre-printed shell and toner-based monochrome) for a single-step hybrid offset/inkjet process</td>
<td></td>
</tr>
</tbody>
</table>

While a SWOT analysis is an interesting academic exercise, it is more interesting to see how print service providers use this technology. With that in mind, in the next section, InfoTrends will highlight some innovative examples.
Hybrid Examples

Two examples will help clarify how monochrome and process color inkjet messaging can be used in a hybrid configuration (in this case, in conjunction with web-fed offset lithography). The samples shown below are based on two fictitious companies, a retail clothing shop called Sorori and a computer game & movie rental service called Front Row Movies. Both examples are highly personalized to the recipient.

Figure 4: Front Row Movies Mailer (front and back)
The Front Row Movies mailer has a finished trim size of 8.25 inches by 11.63 inches (21.6 cm by 29.5 cm), but it opens up to large 20.25-inch by 11.63-inch sheet. It is essentially three pages: two A4 size with one smaller 3.75-inch (9.5 cm) strip running down the right-hand side of the document. This strip contains four coupons and is perforated so that they are easily torn from the mailer as needed. The design is cleverly done so that when the coupon strip is folded and overlays the inside of the mailer, a powerful concentration of personalized messaging is the result. The coupon strip as well as its personalized messaging and images are printed in process color using the S series heads. Another fully variable process color strip runs through the central inside page. These two process color messages are what end up side-by-side after the document is folded. Monochrome personalization and addressing appear on both sides of the sheet.

**Figure 5: Front Row Movies Mailer (Inside with Coupon Strip Folded-over)**
The Sorori fashion catalog is a self-sealed, 12-page mailer with a finished trim size of 6.38 inches by 7.75 inches (16.1 cm by 19.7 cm). The outside cover features a photograph, personalized message, and discount offer. The cover is designed so that the photo of the model varies with each piece. The personalized message drops out of solid color block (unlike many personalized messages which are simply black text on a white background). The recipient’s address is printed in monochrome on the back. Opening the piece reveals a personalized salutation on the inside cover, followed by a series of trimmed pages that have been designed to lead the reader through the various offers on each page. The inside spread reveals eight personalized discount vouchers with process color variable images and discounts. Other pages combine offset-printed images and monochrome inkjet pricing.

**Figure 6: Sorori Fashion Catalog (Front Cover, Multiple Examples)**
The Front Row Movies mailer and the Sorori fashion catalog were produced by Kodak customer The Lettershop Group using an S10 Imprinting System with CMYK. Both jobs were printed on 170-gsm Galarie Silk. InfoTrends recorded a short video blog showing the samples, which can be found at blog.infotrends.com (search on Front Row Movies or Sorori).

**InfoTrends’ Opinion**

Cost, speed, and quality can be inhibitors to the applications suitable for digital print technology. In the case of the Prosper S Series Imprinting Systems, Kodak is removing standing barriers with a technology that can keep up with web offset presses, finishing equipment, and mailing lines to deliver quality output in monochrome, spot color, and process color as the application requires it. The result is liberating, and it points toward more effective print applications that meet today’s need for rapid turnaround and targeted delivery of information.

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