White Paper

Value-added Spot Gloss & Dimensional Effects Achieved Using Digital Printing

Prepared for Konica Minolta

KONICA MINOLTA

InfoTrends

Table of Contents

List of Tables

List of Figures

Executive Summary

Over the past few years, a new class of digital print product has entered the market that is capable of producing special effects, such as spot gloss and clear dimensional print, using inkjet technology and inks cured with ultraviolet (UV) light. These products present a new and attractive value-add opportunity for print service providers to help their customers create eye-catching and tactile designs.

Key Findings

- **Adding value:** When a spot gloss special effect is added to a four-color print, it increases its visual appeal and draws attention to the highlighted item. A dimensional effect multiplies the impact by adding a tactile component to the printed output.

- **Automation:** Reproducing these spot gloss and dimensional effects using traditional methods is possible, but it is a multi-step, time-consuming process. Using UV inkjet greatly automates and simplifies the process, making it possible to implement these effects in short-run, quick turnaround applications. In addition, because the technology is digital, it is possible to target, segment, or fully personalise documents in ways that are not possible with traditional methods.

- **Profit opportunity:** There are two important profit opportunities for this type of UV inkjet technology:

    - **Spot gloss:** Short runs and quick turnaround spot gloss work is economically unfeasible because of the set-up costs of traditional methods. (Note: This also keeps pricing relatively high, which benefits service providers offering spot gloss special effects produced via UV inkjet.)

    - **Dimensional:** Dimensional special effects are unusual, and difficult to reproduce with traditional methods. This helps service providers maintain premium pricing.

Recommendations

- **Seeing (and feeling) is believing:** The gloss levels of UV inkjet are high and the visceral impact of the dimensional effect is astounding, yet difficult to describe in words. Those considering this technology need to see print samples to understand the true nature of these special effects. (Some illustrations are included in this document, and while they do show off the effects, they cannot duplicate the full impact.)

- **Use of variable data:** Though the spot gloss and dimensional effects produced by these new digital technologies are similar to those produced with conventional methods, the ability to do this in short runs and with variable content is unique to digital print. This results in print applications that simply could not be reproduced using traditional methods.

- **Proofing and upselling:** One of the benefits of digital print is its ability to create one-off proofs. This lends itself to upsell potential for virtually any commercial print job. The user can easily show a job as four-color, and then as four-color with a spot gloss or dimensional effect.

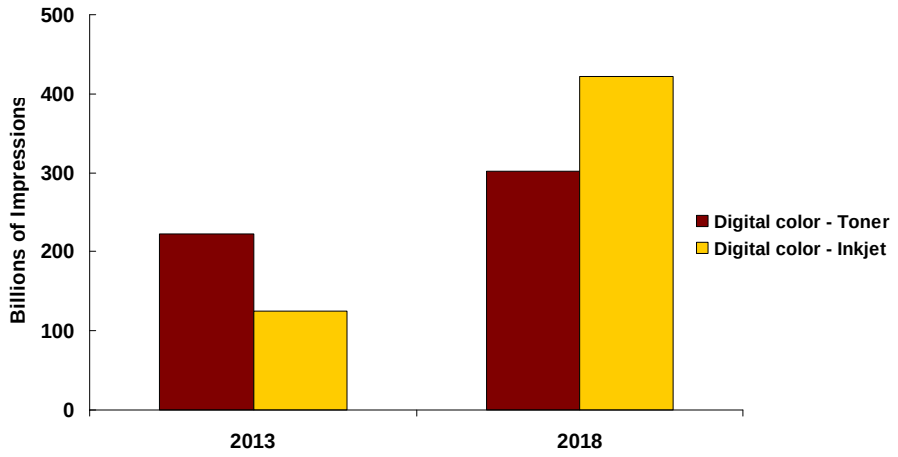
Introduction

Marketers like their messages to stand out. Special effects, such as spot gloss and clear dimensional printing, provide a shine and tactile feel that lifts documents to a new level. Achieving these effects using traditional methods is possible, but unwieldy—particularly for short-run jobs under tight timelines. Inkjet technologies using clear inks cured with ultraviolet (UV) light have made it possible to bring these effects to a broader audience. In this white paper, InfoTrends will explore the market opportunity for these UV inkjet technologies, which are exemplified by the new Konica Minolta MGI JETVARNISH 3DS.

The Impact of Inkjet on Digital Printing

Digital print technologies began to have a significant impact in the 1990s with the advent of black-only electrophotographic copier/printers that were very well suited for the printing of books, manuals, and reports. Colour electrophotography followed and kicked off a revolution in on-demand production digital printing. The ability to produce fully variable documents in the required quantities and timeframe has turned out to be very well suited for today's rapid fire business environment. Devices using electrophotographic toners are used extensively today to produce a wide range of document types. That said, similar advances have been made with inkjet. In the past few years, high-volume colour inkjet systems have begun to produce huge volumes of documents. In fact, inkjet output for colour documents will exceed toner output over the next few years. Inkjet printing is also prevalent for other applications, such as signage, textiles, and even 3D printing. All of this is changing the public's perception of the production capabilities of inkjet.

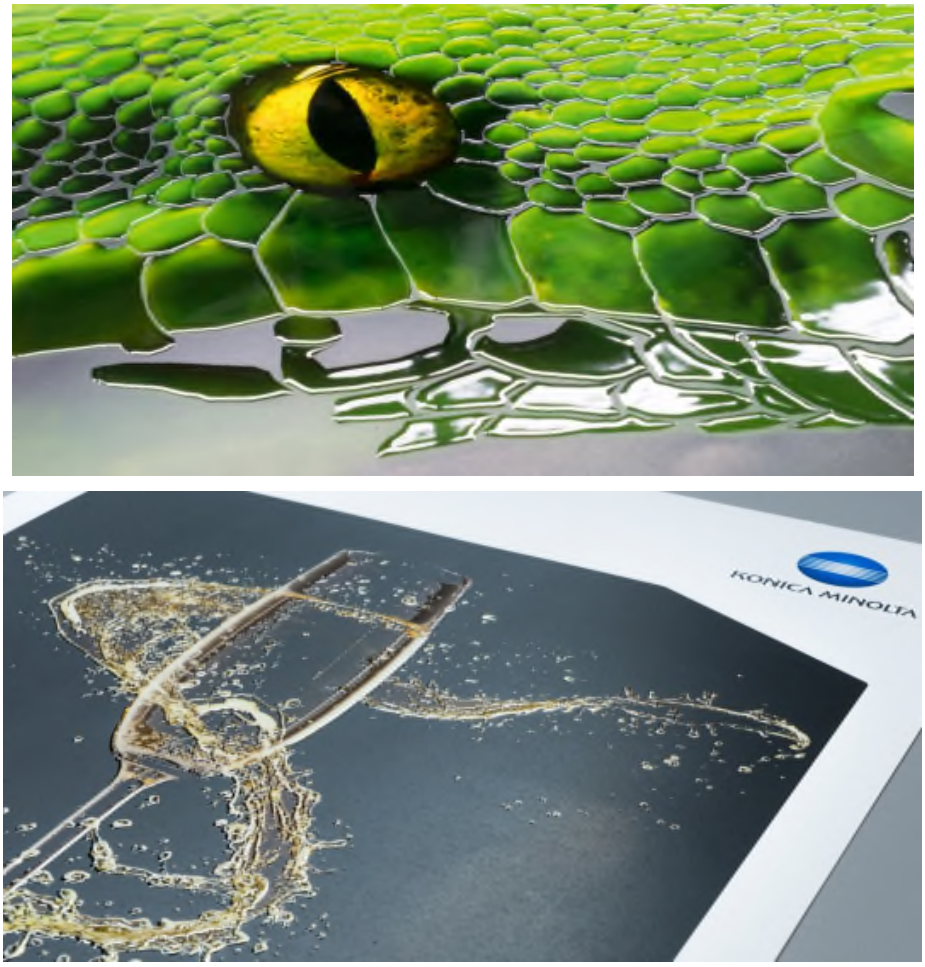
Figure 1: Global Digital Production Colour Print Volume by Technology



Source: InfoTrends Global Production Printing & Copying Market Forecast: 2013-2018

The high speed and high resolution of today's inkjet heads allow them to compete with traditional technologies, such as offset for high quality work in production environments. Yet, it is not just colour printing where inkjet has an application. Innovative product designers have discovered that inkjet heads can lay down clear UV-curable inks in thin or thick layers to produce a range of special effects. A thin layer replicates the spot gloss of the type of aqueous or UV coating that might be applied by the fifth unit of an offset press. A thicker layer produces a glossy dimensional effect in which the surface is raised and appears embossed.

Figure 2: Two Examples of UV Inkjet Special Effects



Source: Konica Minolta

Reproducing spot gloss special effects with traditional methods is possible, but requires a multi-step process employing a printing plate. This method is best used for longer runs. It also lacks the flexibility of digital print, which can produce a new image on each sheet of paper (something that a conventional printing plate cannot do). The set-up procedure for dimensional print effects is even more unwieldy. Special metal dies are required for embossing, and though techniques such as thermography are also used to create raised print, they tend to be reserved for longer run jobs and require additional set-up time.

Using UV Inkjet for Spot Gloss and Dimensional Print Special Effects

A primary example of the use of UV inkjet for spot gloss and dimensional print special effects is the Konica Minolta MGI JETVARNISH 3DS. Produced in conjunction with Konica Minolta's partner MGI, the JETVARNISH 3DS was created with a format size that is well suited for the sheets sizes commonly used in digital print environments.

Figure 3: Konica Minolta MGI JETVARNISH 3DS

Source: Konica Minolta

Konica Minolta and MGI have had a long and fruitful partnership in which MGI has leveraged Konica Minolta electrophotographic and inkjet print engines. In 2014, Konica Minolta extended the relationship by acquiring a 10% share in MGI. The JETVARNISH 3DS is the first product from this relationship to be sold exclusively through Konica Minolta distribution channels.

Table 1: Konica Minolta MGI JETVARNISH 3DS Specification Overview

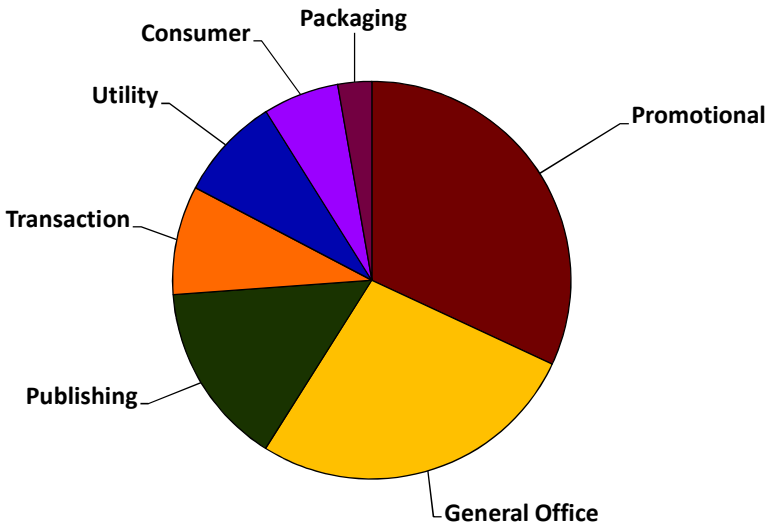
Specification	Description
Printing technology	Single-pass UV inkjet
Inkjet head type	Drop-on-demand piezoelectric printheads from Konica Minolta
Maximum sheet size	36.4 by 104 centimetres / 14.33 by 40.15 inches
Maximum printable width	35.5 centimetres / 13.98 inches
Coating thickness	15 to 100 microns (on laminated and aqueous coating) 30 to 100 microns (on toner and coated paper)
Speed	Up to 2,298 A3 sheets per hour (in 2D/flat mode) Up to 1,624 A3 sheets per hour (in 3D/raised mode)
Substrate thickness (before printing and lamination)	135 gsm and not less than 150 microns or 6 mil (minimum) 450 gsm and not more than 450 microns or 24 mil (maximum)
Other features	Automatic feeder (handles up to 3,000 sheets at 135 gsm) Output stacker (handles up to 3,000 sheets at 135 gsm) Automated registration camera (for accurate registration) Variable data option with barcode reader Optional second print engine (to increase speed and coating thickness—up to 200 microns)

Application Benefits of Spot Gloss and Dimensional Print Special Effects

Spot gloss and dimensional print special effects can be used on a wide range of document types, including business cards and certificates; promotional pieces (like brochures and sell sheets); point-of-purchase displays and table tents; covers for books, CDs, and reports; artwork and posters; invitations and greeting cards; and calendars.

One indication of the types of documents that are most likely to benefit from these special effects can be seen from InfoTrends' production digital print forecast and its associated application breakout. InfoTrends identifies seven major application categories: Promotional, general office, publishing, utility, transaction, packaging, and consumer. Figure 4 shows the application categories that are most commonly printed on cut-sheet production colour digital print devices. The top categories represent some of the highest volume opportunities for the Western European market, which totalled 52.3 billion A4 pages for the category of cut-sheet colour production digital print products with duty cycles less than 1 million A4 pages per month. (Note: Duty cycle is the maximum number of pages a device could deliver in a month running at full capacity.)

Figure 4: Application Mix for Cut-sheet Production Colour Digital Printing (W.E. 2014)



Source: W.E. Digital Production Printing Application Forecast: 2013-2018, InfoTrends

In rank order by volume, the application categories for cut-sheet production colour digital print are as follows:

- **Promotional**: Promotional applications such as brochures, direct mail, and catalogues account for nearly a third of cut-sheet production digital colour volume. All of these applications can benefit from the use of spot gloss or dimensional special effects. Within direct mail, postcards are a key application that benefits from these effects. Another sizeable category within promotion is posters, which have a clear need for special effects to make them stand out.

- **General Office**: General office documents—such as letterhead, proposals, reports, and presentations—are the second largest category with about 28% of the total volume. In this category, one particularly attractive application is for covers that are bound together with the proposal, report, or presentation. Business cards are also in this category, and they are definitely an application that benefits from spot gloss and dimensional special effects.

- **Publishing**: Publishing documents account for close to 15% of the volume. This application category includes books, manuals, magazines, newspapers, newsletters, and directories. The use of spot gloss and dimensional special effects in this category is generally for book, magazine, or other document covers. Greeting cards also fit in this category. They are a very important application for these special effects.

- **Utility**: Utility documents such as forms may require spot gloss to highlight a logo, but the more likely application is for a class of documents called security print, which includes items like tickets. In the case of tickets, a spot gloss or dimensional effect is an easy to implement method to guard against forgery. Name tags and identity cards are another important security application that can benefit from these effects.

- **Transaction**: Transaction documents (e.g., bills, statements, and checks) account for about 9% of cut-sheet production colour volume. This application category is generally not the focus of special effects, such as spot gloss and dimensional print.

- **Consumer**: Consumer applications, such as fine art and photo merchandise, account for about 7% of volume. These applications build off of the creativity of artists, designers, photographers, and consumers. These folks will be excited by the opportunities presented by spot gloss and dimensional print

- **Packaging**: At a little less than 3% of cut-sheet production colour volume, packaging is a relatively minor category for digital print today. Nevertheless, spot gloss and dimensional print special effects are extremely well suited for folding cartons and labels. Another application, table tents, has some similarity to packaging in its structural nature. These can also be used as point-of-purchase displays.

Figure 5: Textured UV Inkjet Special Effect on a Colour Image

Source: The Printer's Edge

Dimensional effects for raised printing on text are particularly effective for applications on business cards, book covers, and greeting cards. These effects are often applied over four-colour printed pieces, but they can be very compelling on their own, as well. Using spot gloss or dimensional on a one-colour design can provide a stunning effect. Spot gloss or dimensional on a coloured paper (with no pre-print at all) is another design possibility.

Figure 6: Dimensional UV Inkjet Special Effect

Source: MGI

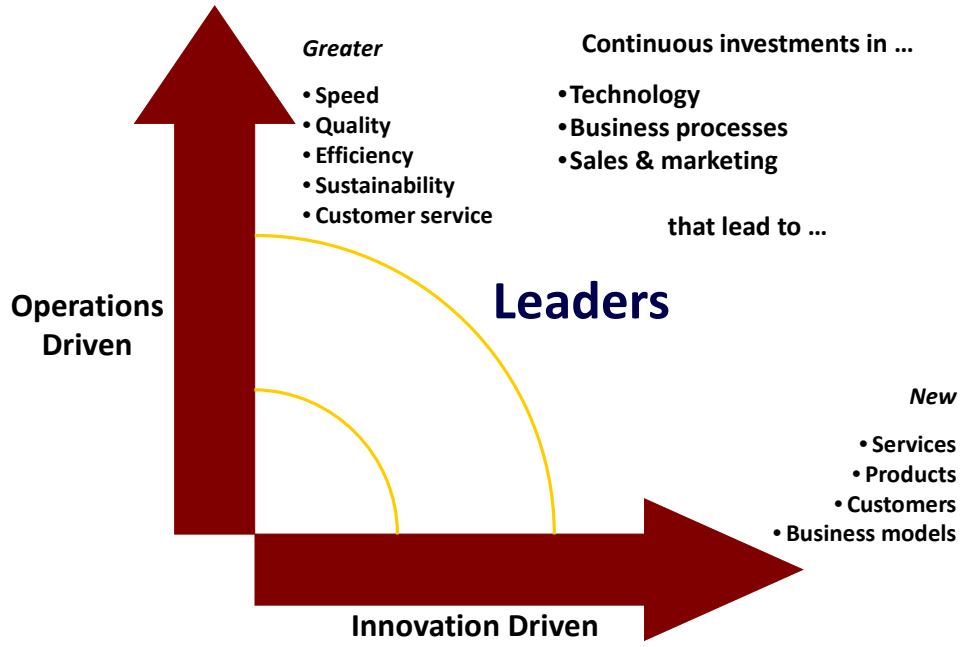
Opportunities for Growth

There are two types of strategic paths that service providers of all types need to accomplish to move their businesses forward: Ones that are operations-driven and ones that are innovation-driven. Both of these require continuous investments in technology, business processes, as well as sales and marketing.

Operations-driven improvements generally result in greater speed, quality, efficiency, sustainability, and customer service. Innovation-driven improvements generally result in new services, products, customer segments, or business models. The laggards in the market are the ones that do neither—the followers are trying, but they cannot reach the operations and innovation levels of the market leaders. InfoTrends feels that it is imperative for print service providers to become more operationally efficient and innovative.

Tools like the JETVARNISH 3DS help print service providers to advance their operational capabilities and to innovate. From an operational perspective, the JETVARNISH 3DS simplifies the process of producing spot gloss and dimensional special effects, while also accelerating the turnaround time. From an innovation perspective, JETVARNISH 3DS lets print service providers add value as well as provide new products and services that they had to outsource previously. This also helps them reach and retain new customers.

Figure 7: Operational Improvements and Innovation



Next Steps

A print service provider looking to acquire a JETVARNISH 3DS must carefully consider the acquisition cost, as well as the ongoing running cost of the materials and upkeep. It is clear, however, that a rapid return on investment (ROI) can be achieved due to the high value associated with these special effects.

Prospective buyers should make careful estimates of the volumes they expect to produce, the price they can reasonably charge, and the costs associated with running the device. These costs include consumables, such as the UV inkjet varnish, the flushing fluid used to clean the heads, and the system's rollers (which are typically changed once a year). MGI, which has extensive experience with its own version of the JETVARNISH 3D, noted that the inkjet heads are very long lasting and durable as long as they are maintained correctly (which includes cleaning the heads at the end of a shift). Konica Minolta's MGI JETVARNISH 3DS has an automatic cleaning system that keeps the inkjet heads in good working order.

One other factor to consider is the difference in varnish consumption between the spot gloss (2D) and dimensional (3D) special effects. As you would expect, the 3D dimensional effect consumes larger amounts of the UV inkjet varnish. In addition, factors such as electric consumption and operator cost need to be part of your decision. Konica Minolta can provide precise cost information related to equipment, supplies, and service so that you can accurately calculate ROI for your specific circumstances.

InfoTrends' Opinion

Print service providers have a unique opportunity to take advantage of a wide range of inkjet products that are having a huge impact on the market. Devices like Konica Minolta's MGI JETVARNISH 3DS take UV inkjet technology and apply it to the creation of some amazing spot gloss and dimensional special effects. These effects must be seen (and touched) to fully appreciate them. They create a value-add opportunity to lift commercial print, publishing, and packaging applications to new levels of customer appeal.

Figure 8: Bubbles Highlighted on a Colour Image

Source: Konica Minolta

About the Author

Jim Hamilton
Group Director
jim.hamilton@infotrends.com
+ 1 781-616-2113
Follow me on Twitter
Connect with me on LinkedIn

Jim Hamilton is Group Director responsible for InfoTrends' Production Hardware consulting services in the areas of production copying and digital printing, wide format, and labels & packaging. Mr. Hamilton is responsible for market research, providing forecast analysis, supporting the consulting service, and creating analysis reports.

Comments or Questions?