Achieve higher densities and greater efficiency in flexographic printing
Kodak DigiCap NX Patterning

Flexography is an extremely versatile and cost effective printing process used in the packaging sector, excelling in its ability to print on a wide variety of substrates. In recent years the flexographic print process has enjoyed a period of continual development, elevating its reproduction capabilities far beyond what has traditionally been possible with flexography, and putting it on a somewhat level playing field with other print processes, like offset litho and roto-gravure.

However, one area where flexography has continued to struggle in some applications is that of ink transfer efficiency. This is particularly noticeable in, though not exclusively limited to, wide web applications that use solvent based inks to print on film substrates. Inefficient ink transfer to the substrate leads to solid print areas displaying a mottled appearance and lower measured densities that negatively affect visual impact of the printed packaging. It is a known deficiency that often leads to roto-gravure being selected as the preferred print process despite its higher cost and unsuitability to meet the industry demands for declining run lengths.

DigiCap NX Patterning is a software-based feature for the Kodak Flexcel NX System that enables a major step forward in ink transfer efficiency through the application of a micro surface texturization pattern to the surface of all elements on the Kodak Flexcel NX Plate. Print applications that traditionally struggle with efficient ink transfer can now enjoy higher print densities, smooth solid area ink coverage and expanded color gamut with process printing. It is a development that now allows flexography to truly compete on a quality level with roto-gravure for flexible packaging.

**Dramatic results**

The application of DigiCap NX Patterning to a job has an immediately visible impact on the smoothness of ink laydown. The traditional voids evident with traditional flexo printing are dramatically reduced and the visual results speak for themselves.

In addition to improvement in the smoothness of ink laydown, dramatic density increases have been measured on prints produced with Flexcel NX Plates with DigiCap NX Patterning applied. Users are reporting average density increases of 0.4 in cyan, magenta, and black, and 0.2 in yellow.

Density increases of that magnitude have a huge impact on the visual appearance of print. Higher contrasts deliver a depth and brilliance that is immediately visible, and increasing the density throughout the full tonal range widens the available range of colors and increases the process color gamut. Combine that capability with the print stability of Flexcel NX Plates and the door is open to make greater use of process color printing, reducing spot colors and reducing costs.

As a result, a print buyer can now achieve superior print quality, with freedom to design, while printers drive efficiencies in the production process.
A new implementation

The concept of using surface texturization techniques to improve ink transfer efficiency is not a new one. Plate surface texturization has generally been accepted as theoretically holding the key to improved ink transfer and has been implemented in a variety of forms over the years. The most recent attempts have been the digital imaging of a cell pattern within the image areas of the plate. Some users have definitely seen improvements with these techniques but, in general, none that could be described as dramatic, consistent or predictable.

The challenge has really been to image a pattern fine enough on the surface of the plate to dramatically affect ink transfer, and to be able to implement it across the entire plate, including solids, lines and halftones. A challenge that has eluded pre-press and plate suppliers until now.

The remarkable innovation in the Kodak Solution is the ability to produce a surface texturization pattern that is finer, more regular and more consistent than ever possible before. The result is a reliable and dramatic increase in ink transfer efficiency, driving both quality and economic benefits for both printer and print buyer.

Enabled by the Flexcel NX System

The innovative software-driven solution that is Kodak DigiCap NX Patterning uses the high resolution, 1:1 digital file to plate reproduction capabilities of the Flexcel NX System to image a superfine micro pattern across the entire imaged areas of the plate. Pattern elements are only 5 by 10 microns in size and are distributed in an even pattern across all plate elements.

Implementation is simple for the operator. Any Flexcel NX System can be upgraded to include DigiCap NX Patterning and, prior to imaging, the operator simply uses the Kodak Tiff Front End application to choose whether to have DigiCap NX Patterning applied or not. Powerful software routines apply algorithms to the 1-bit Tiff file and generate the unique regular pattern that is applied to all image areas of the plate, with the exception of the very finest highlight dots. Despite the complexity of the calculations, streamlined implementation means that the application of DigiCap NX Patterning does NOT negatively impact platemaking efficiency, and the repeatability and fineness of the surface texturization pattern has to be seen to be believed.

The texturization pattern creates a surface characteristic that is significantly more conducive to efficient ink transfer. Many have compared it to the principle that anilox rollers employ to deliver ink
efficiently to the plate itself.

**Maximize profitability**

DigiCap NX Patterning for the Flexcel NX System provides significant efficiencies and return on investment for packaging converters, trade shops, and, ultimately, print buyers—

It can be used as a tool to pursue conversion of designs from roto-gravure production to flexography:

Kodak DigiCap NX Patterning for the Kodak Flexcel NX System closes a gap that finally enables flexography to compete on a quality level with gravure for flexible packaging. The lower production costs and shorter turnaround times associated with flexography make the transition extremely compelling for brand owners and print buyers. This provides significant opportunity for the wide web flexo converter to gain new business and for consumer product companies to reduce their production costs. Wide web flexo printers already using the technology consider it to be the most significant innovation in flexography in the last 10 years and a tool that is allowing them to reposition the flexographic printing process.

**It is used more widely to improve the quality and efficiency of current flexographic production:**

DigiCap NX Patterning has a significant impact on the visual appearance of print. All of these features have a highly positive effect on shelf impact—but what about the cost? Surely higher densities mean more ink is laid down and production costs increase. Not so. The power of DigiCap NX Patterning is such that users are reporting all these benefits with no increased ink usage. And while this might seem counterintuitive, it is indeed what happens in practice. The secret lies in the smoothness of the ink coverage and the absence of voids (the main factor that reduces measured ink density)—the result is no increase in ink laydown but print densities that read considerably higher.

More importantly, the stability of ink laydown and increased color gamut that results from increasing ink density throughout the full tonal range allows flexographic printers to do more with four color process printing and reduce the number of special colors used. Fewer colors means fewer plates, reduced ink costs, faster set up times and greater press efficiency. Wide web flexo printers using the DigiCap NX Patterning technology for the Flexcel NX System are regularly enabling designs to be printed with fewer colors.

**The benefits—simply stated**

DigiCap NX Patterning is revolutionary technology that increases ink density with no increase in ink usage. Flexcel NX System users are using it to great effect to take their flexo printing to the next level, and enjoy print production efficiencies that are keeping them competitive.

- Achieve higher densities
- Print with fewer colors

2010 INTERTECH™ TECHNOLOGY AWARDS

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This paper is based upon an extract from the submission material that resulted in DigiCap NX Patterning becoming a recipient of the prestigious 2010 PIA InterTech Technology Award.