

Dots Do It Right

Getting the right dot structure for its flexo plates was critical for CSW to support both its label and corrugated clientele.

In general, advances in digital platemaking techniques in flexographic printing have been driven by the desire to achieve improved print quality, a streamlined workflow, and more sustainable manufacturing processes. The first generation of flexo plate-setters used round-tipped dots rather than a traditional flat-tipped structure, a change that presented challenges for corrugated converters. These round-tipped dots resulted when the dot surface lost its sharpness and strength due to the presence of oxygen during the plate exposure process. On a corrugated press, this can result in a loss of highlight detail, unpredictable dot gain, increased fluting, and decreased plate longevity.

Waiting for the right time

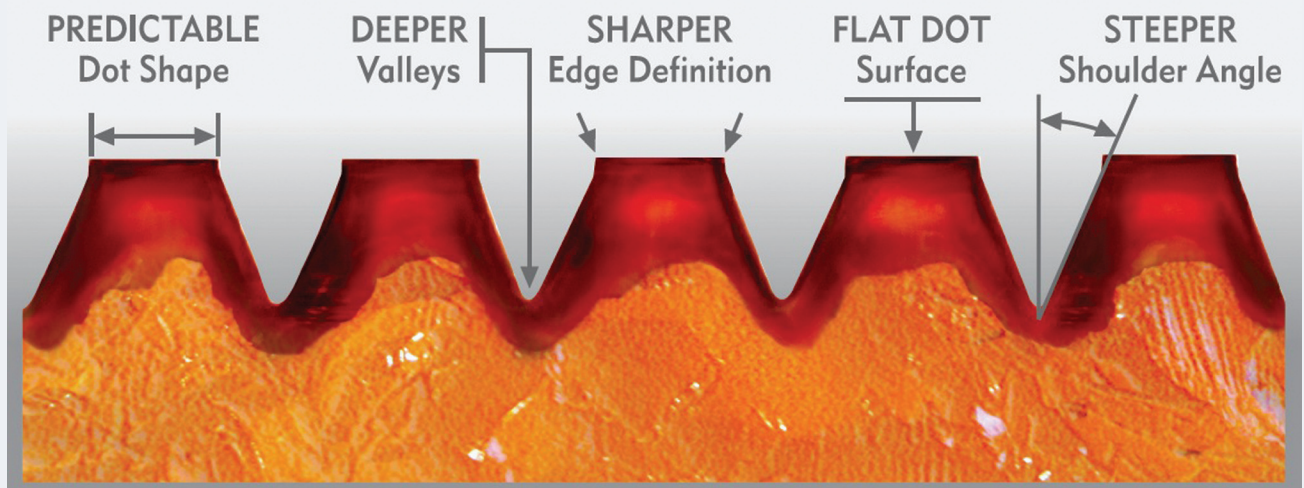
Until January 2009, CSW (Ludlow, Mass.) followed these developments closely and conducted research into several digital platemaking technologies, but held off from committing to invest in any one system.

“Our highly diversified clientele is about 50 percent corrugated, 45 percent wide- and narrow-web, and 5 percent other,” explains Marek Skrzynski, director of graphics, R&D. “For us to have completed the back end of our digital workflow before the right technology became available would have meant that half of our business would remain unsatisfied. It was on that basis that we were unwilling to make an early investment.”

The technical hurdles challenged

CSW’s entire R&D team. “Having earned a reputation among our corrugated customers for high-quality analog plates, rendered at very high resolutions (170 lpi with 660 aniloxes), we didn’t want to lose that by going digital,” notes Skrzynski. CSW knew it needed to find a better way to prevent oxygen interaction with the photopolymer during UV exposure in order to maintain equivalent print quality.

From the beginning, carbon-coated digital plates prevented platemakers from using a vacuum to remove oxygen from their frame exposure units. This inability to inhibit oxygen led to the partial polymerization of the dots, which gives them desirably steep shoulders, but, for corrugated converters, a less-than-desirable round-tipped profile.



CSW found MacDermid’s LUX platemaking technology met its needs for flat-top dots, sharp edges, and steep shoulder to support its corrugated customers.

On a corrugated press, these dots often needed to be over-impressed due to the irregular surface. Flute tops were printing darker, especially in quarter to mid-tones. "Fluting" is the elimination or visual reduction of this effect is considered by many to be the "Holy Grail" of corrugated printing. "The right dot structure can significantly help reduce the appearance of fluting, but to eliminate it entirely will take some effort

from the corrugated manufacturers to produce a better quality board," Skrzynski said

Predictable dot performance

"We have built our entire workflow based on the premise of predictability," Skrzynski says, "and the data gathered from measuring the round-tipped dots proved to be not as reliable as we would like."

On top of that, Skrzynski says, "Corrugated, in particular, needs very specific, predictable dot performance because there are already so many other variables in that printing process. For 20 years, we had been looking for a robust dot with the sharply defined edges and steeper shoulder angles you couldn't get from film. We knew that flat-tipped dots would give us the benefits our customers needed and lead to enhanced performance on press without fluting and extensive dot gain. Our initial attempt to utilize a point light system in order to build such a "super-dot" did not yield the expected results. Oxygen was still a problem."

The other undesirable factor in traditional digital platemaking is the so-called "bump curve," which compensates for loss of highlight detail by increasing the size of the highlight dots so they will hold on the plate. "This technique became the industry standard to combat the effect of oxygen-induced dot erosion, but it also compressed the tonal range, especially in the highlights," Skrzynski notes. "We no longer need to use a bump curve, since our plates are linear."

CSW's need to explore in-house techniques to produce a better digital plate resulted in the installation of their first EskoArtwork platesetter in April 2009. "Our long-term interest in flat-tipped dots also coincided with MacDermid's initiatives in the same area," Skrzynski says. "They were further advanced in their research, but were glad to take advantage of our practical experience. Our R&D partnership resulted in several months of fruitful collaboration and led to the birth of new products for both of our companies."

Let there be LUX

In brief, MacDermid's LUX platemaking process allows corrugated printers to substantially reduce the level of fluting evident in printed screens by changing the profile of the dot in the plate. This is accomplished by laminating a thin film membrane to the surface of the printing plate after ablation, effectively preventing the oxygen from interacting with

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—Marek Skrzynski

the polymer during UV exposure, and ensuring the formation of flat-tipped dots. The process works with existing 0.045 to 0.155 plates from MacDermid, and does not require changes to current equipment—it can be used with all flexo lasers.

The disarmingly simple addition of the laminating step produces 1:1 imaging between the digital plate mask and the printing plate, eliminating the need for a digital bump curve. Benefits include reduced fluting, extended print gamut, longer plate life, higher contrast, and smoother vignettes. “In addition, when combined with HD-XM flexo screens and robust color management, printers can achieve increased resolution and print quality comparable to offset,” Skrzynski says. “We believe these unprecedented improvements truly make this the next generation of digital platemaking. In recognition of this game-changing technology, CSW’s Digital Plate System is now known as Gen2™.”

“Everyone understands the importance of restricting oxygen interaction in their corrugated plate exposure process,” Skrzynski says, referring to similar systems developed by Kodak (FLEXCEL NX) and DuPont (Digi-Corr). “The object is to create a predictable dot structure with steeper shoulders, deeper valleys, sharper edges, and a flat printing surface.

“The integration of LUX with what we already had was totally transparent and seamless, with minimal operator training and only the simple integration of a laminator required,” he continues. “The process was not only simpler and more user-friendly, but we also noted significantly better performance on press. Our customers run longer and cleaner, with sharper details. Our average dot gain curve on corrugated is now similar to SWOP standard.”

“In August 2009 we retired every imagesetter in our Ludlow operation,” Skrzynski says. The company is currently in the process of installing a

second CDI platesetter by December, and regards its seamless transition to digital platemaking with deep satisfaction. Says Skrzynski, “In less than one year we’ve become 100 percent digital across our highly diversified customer base, while preserving our reputation as a high-quality flexo prepress provider. Customers never saw us slowing down or struggling with technical issues. We take great pride in that.” ■