



BOTH IMAGES WERE PRINTED ON B-FLUTE AND RUN ON A FIVE-COLOR PLUS UV MARTIN HBL PRESS. THE IMAGE ON THE RIGHT WAS PRINTED WITH A CONVENTIONAL DIGITAL PLATE. THE DESIGN ON THE LEFT WAS PRINTED WITH A LUX PRINTING PLATE.

RE-SHAPING FLEXO POST-PRINT

MACDERMID'S LUX PLATE PROCESSING TECHNOLOGY IS THE LATEST DEVELOPMENT IN FLAT-TOP DOTS FOR FLEXO PRINTING.

By Jackie Schultz The world is becoming flat, at least the corrugated printing world. MacDermid Printing Solutions is the most recent company to introduce a new plate processing technology that produces flat-top dots on flexo printing plates. The LUX™ process received the 2011 Technical Innovation Award from the Flexographic Technical Association.

Printing plates made with the LUX technology enable corrugated post-printers to consistently offer their customers better quality printing, which in many cases means reduced fluting.

"One of the detriments of digital in corrugated, if there is a detriment, is that digital plates flute more in screens," explains Colleen Twomey, MacDermid Applications Specialist.

"That has been the bane of the corrugated market for a long time, especially if they're printing on doublewall or C-flute. If their customer isn't willing to pay for good quality liner, running a digital plate with screens will result in heavy fluting, even compared to analog."

The reason digital plates flute more than analog plates is because of the dot shape differences. Analog plate dots have a flat surface and digital plates have a rounded surface.

"Any time you're printing on an undulating surface some dots have to sit on the tip of the flute and some dots have to make it down in the valley. With a standard digital plate, because of the shape of the dot, you're getting more gain at the tip of the flute in order to get ink to be



THIS WAS PRINTED ON A 66-INCH UNITED FOUR-COLOR ROTARY DIECUTTER WITH THE SOLID AND SCREEN IMAGE ON THE SAME PLATE. THE PLATE WAS A LUX .250" SHEET PHOTOPOLYMER MOUNTED ON .010 TIN ON C-FLUTE.

Proven Results

Jeff Domnick, corrugated prepress specialist at OEC Graphics, Inc., in Appleton, Wis., says he was familiar with the flat-top dot technology but admits to being skeptical about its ability to improve print quality. He tested the LUX plate on a one-color job with several different line screens and percentages. "We did some side by side testing with a standard digital plate versus a LUX digital plate. It was pretty dynamic what we

delivered in the valley," Twomey says. "With LUX, because of the flat surface some of that compression is absorbed in the plate so we have a more even print surface thus the fluting is minimized. It's not eliminated. That minimization depends on press hygiene, the type of board. If you're printing on recycled stock on C-flute versus a high holdout clay liner on microflute, there may be a difference but there will typically always be a difference in fluting."

Tim Gotsick, MacDermid Global Director of Innovation, adds that with the LUX plate there is less impression sensitivity. "We've done studies on a number of substrates and when you add impression to a digital plate you get a dramatic jump in gain. The amount of gain increase as a result of impression increase is halved with the LUX dot. There simply is more latitude for impression with this dot shape so that contributes to the reduction in fluting."

saw on the LUX side," he says. "We saw tremendous flute reduction, and we were able to extend our gamut as far as what we were able to hold on the plate considering we were using a .155" printing plate mounted on .125" foam PVC. We were able to hold a 1% dot and able to hold open a 95% dot.

"I did not really believe we would see that substantial of a difference because all we're doing is changing the shape of the dot and I really didn't think it would matter, but I was wrong," he adds.

OEC Graphics began making LUX digital plates about a year ago. Domnick already has a few success stories from his corrugated customers. "They love it. There isn't anything they have to change. All their settings stay the same, and their board making is the same."

One customer that benefitted was the Packaging Corporation of America plant in Burlington, Wis. The plant has been using

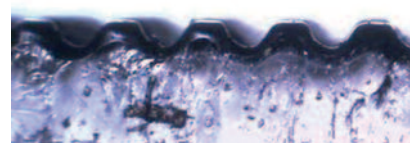
LUX digital plates since February. "We are using LUX plates on approximately 10% of our new items," says Terry Kruger, Material Control Manager. "A big advantage is the reduction in fluting. We have one large customer that has complained in the past about fluting. They have noticed a difference in the quality since we started using the LUX plate."

The plates are mounted on the plant's Martin NT HBL. "We are using these plates on all of our process printing or any item that has a large area of screen," Kruger says. "We have used the LUX plate on Kemi and mottled white. The highest line screen we print is 85 LPI. We have run lower line screens in the past if we thought there would be a lot of fluting due to the board grade or if there was a large area of screen. We are now able to run 85 LPI screens on items that we wouldn't have in the past."

Another OEC customer, Green Bay Packaging's Wausau, Wis., Division, has been using LUX printing plates on its 66-inch United rotary diecutter for about 10 months. "We are using slightly older equipment with .250" thick plates mounted onto .010 tin and we are seeing

THE PROCESS RECEIVED THE 2011 TECHNICAL INNOVATION AWARD FROM THE FLEXOGRAPHIC TECHNICAL ASSOCIATION.

THE STANDARD DIGITAL DOT PLATE HAS A ROUNDED SURFACE.



THE LUX PLATE'S FLAT PRINT SURFACE MINIMIZES FLUTING IN SCREENS.



Advances in Post-print



C Flute coated liner



B/C Flute coated liner double wall



C Flute un-coated liner



B/C Flute un-coated liner double wall

THE PHOTOS ILLUSTRATE HOW LUX PRINTS ON DIFFERENT TYPES OF LINERS AND FLUTE TYPES.

good results as if we were running thinner plates on sponge," says Chuck Gaedtke. "We typically run 42 LPI screens on kraft and mottled white substrates."

The Wausau plant has received several compliments on its Dental Crafters box (see photo on previous page). "It has run several times with the same results," Gaedtke says.

Graphics Solution

Domnick points out that OEC does not use the LUX technology for every corrugated plate it makes. "This isn't an every day product. It has to have a screen on the image in order to get true benefits."

Twomey says LUX is suitable for any application in direct print that suffers from fluting and screens. "A lot of that is still brown box, 'This end up,' 'Do not drop,' really heavily fluted boards."

As an example, she references the large corrugated boxes for big screen television sets sold in warehouse stores like Sam's Club and Costco. "Essentially those are a one- or two-color job on brown. That TV

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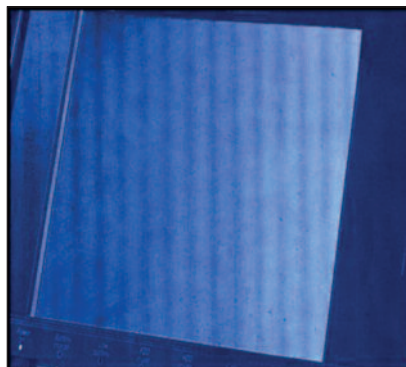
screen (image) is one giant screen and looks like crap in the stores. Something as basic as that graphic can be drastically improved," she says.

On the higher end graphics side, she says corrugated converters that have servo driven eight- and nine-color presses with 500, 600 and 700 line anilox rolls can take advantage of the lower mechanical gain that LUX has to offer.

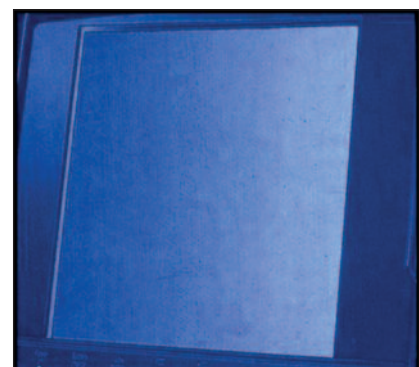
In some instances, Twomey says higher-end graphics printers are seeing a jump in line screen when using a LUX digital plate. "Some are printing 120 to 133 line screen and we have seen situations where these printers can increase line screen without having to purchase new anilox rolls. If you don't have to change tooling and you can increase line screen and get that next graphic level because of a plate that has a better dot structure that certainly is an ROI that's obvious."

Domnick agrees. He compared a job run in 2009 using standard digital plates with the exact same design printed with the LUX printing plate. "It is night and day as far as the amount of fluting. It was the same plate material in '09 and all we used was flat top. It's like a modern day miracle. There is no fluting."

The job was run on a five-color plus UV Martin HBL press, printed on B-flute Kemi stock. The line screen was 65 in 2009. OEC was able to increase it to 72 LPI with the LUX plates.



HEAVY FLUTING IN SCREENS



MINIMAL FLUTING IN SCREENS

The plates can be used on any press and undercut and there are no special requirements in terms of storage and care. They cannot be used with standard digital files. MacDermid recommends doing a one-color linear test file that includes different screens and images to determine dot gain. Then the printer can follow up with a verification run and live job. The dot gain compensation for LUX plates will be different than for digital, so it is not recommended to use the same digital files for live LUX jobs.

"IF YOU DON'T HAVE TO CHANGE TOOLING AND YOU CAN INCREASE LINE SCREEN AND GET THAT NEXT GRAPHIC LEVEL BECAUSE OF A PLATE THAT HAS A BETTER DOT STRUCTURE THAT CERTAINLY IS AN ROI THAT'S OBVIOUS," SAYS COLLEEN TWOMEY OF MACDERMID.

"There are no format limitations with the use of LUX so it can be used all the way up to the largest digital plates available as well as the different thicknesses," adds Gotsick.

The process is available globally. About 15 trade shops in the U.S. and Canada have incorporated the process into their workflow.

Simple Workflow

Printers and plate makers across all flexo market segments can use the LUX technology. The process involves laminating a proprietary membrane over the top of an image-ablated digital flexo plate, conducting standard UV exposure of the photopolymer through the membrane and removing the membrane prior to processing. These steps exclude oxygen from the photopolymerization reaction and make 1:1 mask:plate imaging possible. As a result, the smallest flat-top dots are sturdy, less sensitive to both press impression and wear and more conducive to highlight detail than bullet-shaped dots of the same size.

Twomey says it is easy to incorporate into the plate making workflow and requires minimal capital cost.

In addition, it works with any existing digital prepress workflow, no compress gas is required and it works with existing exposure equipment without modification.

"There is no special workflow change or software or hardware change required for the trade shop. The only thing they need to do is add the laminator and the lamination step is less than two minutes," she says. "Usually the first reaction when people see it is, 'Is it really that simple?'"