Flatbed printers are one of the fastest growing segments of large format printing technology.

A variety of different base substrates is easily handled by many digital flatbed printing systems.

DIGITAL SYSTEMS ADVANCE PACKAGING
PROTOTYPING

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People naturally resist change. However, shown a better alternative, change becomes a no-brainer. If you currently produce packaging prototypes, or rely on them for any part of your business, there are some technological advances in the large format digital printing industry that could be beneficial. These advances can make a world of difference in the creation of packaging prototypes.

In a matter of a few years, the art of large format printing has changed significantly. Until recently, all graphics were printed on a roll-to-roll inkjet. Then the completed print roll was placed on a laminator and mounted onto a rigid board that was finally trimmed to size. Not only does this process take considerable time and labor to produce, but the risk of ruining the print at any stage necessitates producing extra prints as a backup. Overall, this means increased waste and added costs.

Current Drawbacks

The prototype is important at many levels, from determining the most appealing design with focus groups and brand managers, to finding the most cost-effective, sustainable design and ultimately producing the production work for the product manufacturer. It makes sense to present the highest quality prototypes to your client.

Consider the current prototyping process. Many packaging designers and

manufacturers are still first determining their structural design and either cutting paperboard with a razor or at best with a digital sample cutter. Once the final structural design is agreed upon, the graphics can be produced. Graphics are then printed on some other device — be it a proofer, small offset press, inkjet or color laser printer and then literally applied in a separate operation before or after cutting.

The prototype may not look quite like the final product — the white point of the paper and the color gamut of the printer can be very different. And what if the proposed base is colored or textured?

Compounding the problem is that usually more than just one prototype is required to satisfy all the focus groups that need to see the latest iteration of the design. All that has to happen before considering any short run production for a possible test market.

The risk of damage (leading to extra print runs), additional steps, labor and long turnaround times are much like those experienced in the world of large format graphics production.

Digital Flatbed To The Rescue

Advances in digital printing technologies have streamlined the process for creating digitally produced large format graphics and now packaging prototypes. Flatbed printers have been one of the fastest growing segments of large format printing technology in recent years due to their ability to print direct to rigid substrates, eliminating the need to mount roll-based prints on to boards.

The first flatbed inkjets eliminated all the print-mount-laminate issues and quickly became the "must have" device for many graphics shops, giving them a competitive edge and expanding their product offerings and profits. Many of the first flatbed printers used solvent inks, which are incredibly outdoor durable, but pose potential environmental problems. Meanwhile, digital UV inks and grayscale inkjet printhead technologies were advancing at a rapid pace and were gradually adopted by printer manufacturers into the designs of their next generation printers.

UV flatbed printers are now the fastest growing segment of the digital printing market, while the aqueous and solvent printer markets are declining. In 2006, Océ introduced the Océ Arizona® 250 GT UV flatbed printer, which immediately won the Digital Printing & Imaging Association's Vision Award for a product that would have a profound and lasting impact on the graphics industry.

The Arizona Series has become the best selling UV flatbed printer in its class. It uses Océ VariaDot™ imaging technology — a grayscale print system that sets a new standard with near-photographic image quality — and provides an exceptional color gamut. The printers can easily handle irregularly shaped rigid items from small to full size four-by-eight foot sheets, and can accommodate flexible media with the Roll Media Option. Some flatbed printers also support white ink printing, such as the 350

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The Arizona 350 GT printer offers a white ink option and a roll media option.

GT and 350 XT models. With white ink capability, converters can print prototypes directly onto colored or clear media and substrates.

Streamlined Workflow

Océ realizes the value of finishing (i.e. cutting) the rigid and roll substrates to their final shape and offers the ProCut™ line of digital cutters to do so. By combining the ProCut cutter and Arizona Series printer with sophisticated workflow software to manage cutting and nesting, plus ONYX® ProductionHouse™ software — a full ICC and Pantone®-certified RIP to process the graphics — the Océ Streamlined Workflow was born.

Any graphics shop could now go from "zero to sixty" in no time and produce the highest quality inkjet prints onto a wide range of substrates; cut, crease and route the material; and ship it to the customer all in the same day. Producing this the 'old way' would have taken days and required far more labor and expense.

The Streamlined Workflow addresses the very same issues in producing packaging prototypes as it does in the graphics industry. The overall process is streamlined. Changes to the structural design and graphics can now be quickly realized on the final stock and with cost-effective press-proof quality results.

A New Process

As currently done, packaging designers create the dieline using CAD-based design software such as IMPACT from Arden Software or similar. Next the graphics are brought into the CAD software or the dielines are imported into a graphic design software program like Adobe® Illustrator®. This file containing both the dieline and graphic is then saved as a PDF or EPS file and brought into the Océ ProCut Prepress software.

The software enables a designer to confirm that cutting and creasing tools are assigned to the correct lines and, if not, reassign them. The operator can then add optical registration marks around the dieline, add a dieline barcode and then nest it with additional files and/or additional copies.

The ProCut Prepress software will intelligently nest the shapes to best fit onto the selected sheet size. If the user determines this auto-nesting is not appropriate, he can still manually reposition and rotate to fit the shapes together as needed.

The file is then "prepared" where it is essentially split into two components — the dieline data, which goes to the cutter; and the graphic data, which is sent to the ONYX ProductionHouse RIP that feeds the Arizona printer.

At the RIP, users can work in a complete start-to-finish ICC color managed environment and even substitute Pantone spot color for the closest CMYK equivalents based on Pantone-licensed L-a-b color values. The processed file is then sent to the Arizona printer where the operator loads a sheet of paperboard onto the stationary vacuum table and prints the packaging graphic including the previously added registration marks and barcode.

The completed print is then put on the ProCut cutting table, and the barcode is scanned to call up the correct dieline. The operator can recall the tool parameters for the knife and creasing wheel (and even a router or additional tools), locate the first registration mark with the onboard camera and begin automatically cutting and creasing.

This is just one way of working. The versatility of the printer's stationary vacuum table enables users to print in perfect register onto pre-cut pieces. This approach essentially reverses the process from print and cut to cut and print. This means that variations of design can be worked on independently and printed onto blanks that may already exist or are sourced elsewhere.

Many packaging companies have already invested in sample cutters because they see the value the cutters have brought to produce quick and accurate structural prototyping. By utilizing the Arizona Series of flatbed printers, it is now possible to realize the same benefits with the graphics part of the prototyping process.

Océ has tied all this together with the Océ Streamlined Workflow providing a well-integrated system from cutting to printing including software.

The ProCut digital cutting tables are available in a variety of sizes.

UV and Grayscale Printing Technologies

UV (ultraviolet) technology is one of the most advanced digital printing systems in use today. It uses specially formulated UV inks designed to run in piezoelectric printheads on an inkjet printer. Once the printhead deposits the ink swath on the substrate, a special UV lamp follows and cures (hardens, 'dries') the ink.

Flatbed users prefer UV technology because UV inks adhere to nearly any substrate, either rigid or flexible. Unlike aqueous printers, UV printers can print on inexpensive, uncoated paper and substrates. And unlike full-solvent inks, UV inks do not emit potentially harmful VOCs (volatile organic compounds).

Grayscale printing uses variable ink drop sizes (sizes and number of drops per printhead varies by manufacturer). A smaller drop size helps produce sharp images with smoother gradients and quartertones. Larger droplets produce dense, solid colors.

The greater the range of droplet sizes, the better quality print. Some systems like the Océ Arizona Series of printers produce prints rivaling photographic quality.

With the Streamlined Workflow, all you need to create prototypes is available in one system. It takes only four simple steps from artwork input to finished print.
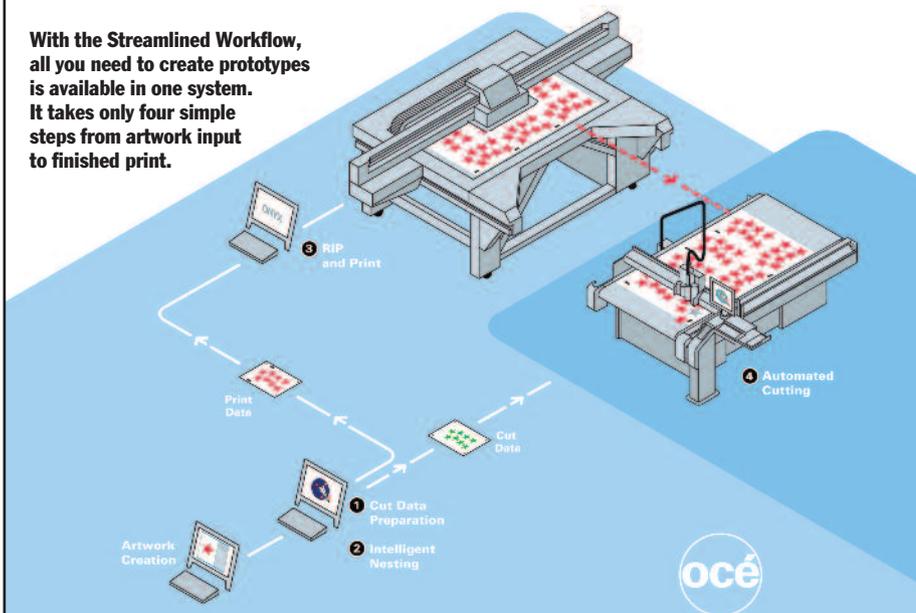
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