

How UV-LED Inkjet Technology Is Increasing Profits for Flexographic Printers

Having the ability to quickly create a realistic package prototype that impresses a potential client with its detail and accuracy can make all the difference in the world when it comes to winning business in today’s competitive marketplace. Until recently, the problem has been how to easily and effectively achieve this level of realism - a prototype that closely matches the final product - cost effectively and within a short window of time. Using specialized proofing equipment or stopping the press to run samples can cause considerable inconvenience not to mention thousands of dollars of lost production revenue. Today’s advanced digital UV inkjet printers and printer/cutters offer companies specializing in flexographic printing an effective, affordable, user-friendly solution.

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How Digital UV Inkjet Printers Are Revolutionizing the Pre-Press Process

Previous workflow takes days:



Incorporating state-of-the-art technology, UV inkjets are capable of producing realistic package prototypes in hours instead of days or weeks, without the long set-up time, waste and returns associated with traditional package prototyping methods. In addition to enabling flexo printers to create high quality prototypes in-house and in record time, the ability of UV devices to print on virtually any substrate allows for the creation of package prototypes using materials identical to those used in the final print run. The advanced features of UV inkjet printers also make it possible to incorporate unique, eye-catching varnish and embossing effects that add value and appeal to any prototype. These innovative UV devices are opening up new profit centers as well, allowing flexographic printers to accept shorter runs and new types of print jobs that previously wouldn't have been economically feasible.

By making it possible to create detailed, realistic prototypes without taking the press offline or outsourcing, a digital UV inkjet printer, such as those within Roland's VersaUV® series, can save valuable time reducing both cost and labor. Because these machines are capable of printing directly onto the flexible substrates and clear films often used in flexo jobs - including PET, PP and shrink wrap - accurately matching colors and providing "proof of concept" becomes a much easier task. A packaging design firm, flexo printer, or converter that adds a UV printer into its daily workflow can show a prospective customer a prototype that resembles the final, finished product in every respect - right down to the client's desired packaging material - within hours.



Proofing

A big part of the pre-press process is proofing, which can be an expensive and painstaking process. In a flexo operation, even a single proof or comp requires creating plates, which adds labor and material cost to the job. While many shops rely on water-based inkjet proofing devices to curb costs and produce proofs,



these platforms don't always support the types of films and other substrates used to produce flexible packaging. And, prototypes produced on substrates differing from those used in the final product - even if those differences are subtle - can cause problems when the job goes to production. The emergence of UV-LED inkjet printers addresses this dynamic.

These devices deliver both the precise color imaging of water-based inkjets and the broad media support needed to effectively simulate on-press results, at a fraction of the time and cost.

Distributed Print Operations

Employing a UV printer can also greatly enhance and expedite the pre-press process when more than one facility is involved. Advanced color management software designed to interface with Roland's VersaUV printers - including programs from GMG, CGS and EFI - dramatically improve color-matching accuracy and simplify the entire proofing/color verification process. Working in conjunction with Roland's advanced VersaUV printers, this software not only enables you to hit the exact color you're looking for, it also ensures consistent results across pre-press and production platforms when printing takes place at multiple locations. For example, proofing can take place at a facility in the U.S., and you can expect the same results from printing presses, whether flexo, rotogravure, or lithographic, located anywhere in the world.



Finishing

Package designers and brand managers often wish to see a variety of packaging options that differentiate their products from competitors while capturing the look and feel of finished goods. VersaUV printers and printer/cutters offer a variety of finishing options. Clear Coat ink offers the ability to add matte or gloss varnishing effects for highlights or floods that closely match the final printed product. You can even simulate embossing for brand names or special effects.



Finishing also includes die-cutting and scoring of the materials. A UV-LED printer featuring integrated contour cutting, such as Roland's LEC-330 and LEC-540, not only prints but also performs scoring, kiss cutting and die cutting

functions all in one seamless workflow, assuring that the proof you review is truly representative of the final product.

Low Heat Curing

Although UV inkjet printing has been around for quite a while, until recently, it was limited by the nature of its curing technology. Conventional UV lamps can reach temperatures as high as 1500°F (800°C), virtually eliminating the possibility of printing on any heat-sensitive material. Today's UV-LED lamps generate very little heat, allowing them to print on a wide variety of films used in flexible packaging, including clear, metallic, colored and shrink.

Specialty Ink Benefits

In addition to printing CMYK, Roland's VersaUV printers can also be equipped with specialty inks, including clear and white. The ability to print high opacity white ink is especially important for flexographic printers, since many flexo jobs involve printing on metallic, clear films and shrink wrap. Roland's ECO-UV® and ECO-UV® S inks dry instantly and are extremely durable, so they won't rub off like other white inks. ECO-UV S ink can also be stretched and applied around curved surfaces and edges without peeling or cracking, making it ideal for shrink sleeves, shrink wrap and other vacuum forming and flexible packaging applications. Clear coat offers advantages, including an unprecedented high gloss finish on output, special varnishing and embossing effects, scratch and chemical resistance, and enhanced outdoor durability. Digital UV inkjet printers that support specialty inks improve and expedite the proofing process, allowing you to get the highest degree of accuracy and assuring the success of your final press run.



Low Operating Costs

Low cost of operation is another UV-LED technology benefit. In fact, the cost of producing a sample on a UV-LED device can be as low as a few cents per sample. Compare that to an estimated dollar-per-sample cost basis for the same proof generated on a water-based inkjet or \$50 to \$500 per sample when outsourced. Running a press to produce proof samples is even more expensive. Plus, UV-LED inkjet proofs can be produced on demand - in one or two hours if needed - allowing design and production changes to be implemented in real time.



UV Printers in Action

To get a feel for how UV technology is revolutionizing pre-press and proofing, it helps to take a look at some real-world examples. These companies are currently putting advanced UV-LED printers to work in their respective businesses to increase the efficiency, capabilities and overall success of their operations.

PBM Graphics, Inc.

Packaging Prototypes Increase Sales for North Carolina Printer

Durham, North Carolina-based PBM Graphics, an “A to Z” printing and fulfillment company that employs a staff of nearly 600 and has specialized in commercial printing for more than 30 years, operates under the umbrella of Consolidated Graphics - a 70-company business network generating \$1 billion in annual sales. PBM, which runs multiple sheetfed and digital presses as well as a full web and flexo press, started producing packaging prototypes in late 2011 when it purchased a Roland VersaUV LEC-330 UV inkjet printer. Since then, the company has successfully grown its business by offering package prototype services.

PBM uses its VersaUV to produce prototypes of gift card carriers for many of the most recognized retailers, overwraps for trading card clients, and shrink wrap prototypes for bottle packagers and adhesive label packages.

“We originally purchased the VersaUV for its opaque white capabilities, but use it far more often for prototyping,” said Adam Geerts, President of PBM Graphics. “We really appreciate the LEC-330’s ability to produce textures, like simulated foil stamping and embossing, as well as the wide variety of substrates the printer can accommodate.”

“Among all the millions of dollars of equipment we’ve purchased over the years, nothing has generated as much excitement with the sales team as the VersaUV LEC-330. There’s a lot we can do to show the customer what a finished product will look like without having to manufacture one.”

Adam Geerts, President, PBM Graphics

Geerts points out the significance of PBM’s LEC-330 purchase. “Among all the millions of dollars of equipment we’ve purchased over the years, nothing has generated as much excitement with the sales team as the VersaUV LEC-330. There’s a lot we can do to show the customer what a finished product will look like without having to manufacture one,” he said.

According to Geerts, the functionality and capabilities of the LEC-330 have allowed PBM to save a significant amount of money. “The foil stamping, embossing and printing plates made a lot of prototype projects cost prohibitive in the past,” Geerts said. “With our VersaUV, we’re now able to produce the same jobs that previously would have gone through full manufacturing for pennies on the dollar.”

Geerts also notes the importance of being able to create realistic prototypes affordably and in-house when it comes to acquiring new business. “A lot of what we do is done at our own expense to help a sales person get a foot in the door or to assist an agency in winning a campaign. It’s one thing to talk about an idea, but to be able to see and hold the concept is much more compelling,” he said.

“The VersaUV is the highest quality digital proofer that we’ve ever experienced,” said Geerts. “We can get the resolution, color and textures needed to make accurate prototypes for any of our customers.”

K1 Packaging Group

VersaUV Allows California Printer to Fully Satisfy Existing Clients and Attract New Customers

Headquartered in City of Industry, Calif., K1 Packaging Group produces paperboard folding cartons, digital and flexo printed labels, and high-end graphic packaging materials for both domestic and international retail. K1’s clients include companies within the food and

“Many of our customers’ projects are printed on holographic material. The fear of running a print job without first producing a sample is very high, with all that could go wrong and the costs involved if it does,” said Tsai. “The LEC-330 has eliminated that fear by enabling K1 to create prototypes that closely resemble the finished product.”

Jimmy Tsai, Sales Manager, K1 Packaging Group

beverage, beauty and cosmetic supply, media software/hardware, and nutraceutical and pharmaceutical industries. In addition to their main 85,000 square-foot location, K1 has another 20,000 square-foot facility in Pomona, Calif. that houses Everest Packaging, which focuses on contract packaging. Altogether, K1 employs a staff of 90 and a variety of devices, including Mark Andy, Inc. flexographic printers and a Roland VersaUV® LEC-330 UV-LED Printer/Cutter.

Jimmy Tsai, K1 Packaging Group’s sales manager, notes that the LEC-330’s ability to produce highly realistic prototypes, along with the printer’s unique embossing and spot UV capabilities, is what won them over. “Many of our customers’ projects are printed on

holographic material. The fear of running a print job without first producing a sample is very high, with all that could go wrong and the costs involved if it does,” said Tsai. The LEC-330 has eliminated that fear by enabling K1 to create prototypes that closely resemble the finished product.

According to Tsai, early concerns over the ROI his company would see from the LEC-330 purchase were quickly alleviated. He notes that the investment has completely paid off, allowing K1 to bring in a new base of customers - primarily from the personal care and cosmetic industries - in need of package prototypes that look like the real thing. In serving this higher-end clientele, K1 has also found the LEC-330’s ability to print white ink extremely useful for creating packaging that really pops and attracts consumers.

Tsai points out that his customers are thrilled with everything the LEC-330 can do. In addition to enabling K1 Packaging to create realistic prototypes efficiently and cost effectively, it has allowed the company to increase their relationships and become more involved with clients at an even earlier stage in the creative process.

White Graphics, Inc.

UV-LED Technology Enables Illinois Shop to Produce Realistic Flexible Packaging Prototypes

Employing a staff of nine at its Downers Grove, Illinois headquarters, White Graphics produces flexible packaging, displays, cartons, pressure sensitive labels, mockups and sales samples. The company’s client list includes a number of corporations, such as M&M Mars, Unilever, PepsiCo, Sonoco, Handi-Foil and Packaging Corporation of America - all of which depend on White Graphics to provide them with high quality, innovative packaging solutions. To expand their production capabilities, White Graphics purchased a Roland VersaUV LEC-300 printer/cutter. Following the success of the 300 model, a VersaUV LEJ-640 flatbed printer was recently added to the workflow. The ability to print on such a wide variety of substrates has made a major impact on the company’s success.

Richard White, president of White Graphics, appreciates the durability of Roland’s ECO-UV inks, especially when printing on foil bags and other flexible substrates. “The inks have a lot of stretch to them so they don’t crack, yet the surface passes any rub test you can imagine,” he noted. “The ability to create very tight comps of flexible bags with white underlay, as well as the corresponding corrugated and folding carton pieces, has made us a valuable partner in product development for our clients.”



“Applying white underlay and ECO-UV Clear Coat overlay on foils in conjunction with full-color process creates an almost perfect comp as an end result,” added vice president Andrew White.

Because White Graphics produces packaging for the food industry, samples of their printed products are rigorously tested at sensory laboratories to check for any retained odors from the printing process. To comply with the testing procedures, White Graphics’ food packaging print samples are wrapped in aluminum foil and sent directly to a laboratory. “The packages we printed on the VersaUV passed the lab test with an A+,” Andrew said.

Operating in a niche market that depends on their ability to turn around complex jobs quickly, White Graphics relies on the company’s ingenuity and the advanced functionality of its equipment to satisfy its existing clients and attract new customers. “There isn’t a job that comes in here that isn’t a challenge, said Andrew. “The VersaUV quite simply allows us to provide better service to our clients.”

Package Prototyping 101: Why Universities Have Adopted Roland VersaUV Technology

Outside the business arena, VersaUV technology has found an enthusiastic audience within the university system, where the basics of the design, printing and finishing processes are taught to aspiring package designers. Across the U.S., several of the most renowned package design schools have adopted VersaUV technology, citing its quality, efficiency and overall versatility as key factors in their selection process. While these institutions often serve a range of student requirements and applications, having VersaUV in-house allows them to also explore design concepts on the vast range of substrates that flexo presses support.

Two such universities include the Sonoco Institute of Package Design & Graphics at Clemson University and Rochester Institute of Technology (RIT) School of Print Media. For these and other institutions, VersaUV’s unique ability to print, score, die cut and emboss actual press substrates to exacting specifications makes it a great platform for both instructional and research purposes.

The Sonoco Institute of Package Design and Graphics at Clemson University

What makes packaging appealing to consumers? Why do certain colors, textures and graphics generate interest while others get passed over? The Sonoco Institute of Package Design and Graphics at Clemson University in Clemson, S.C. exists to help answer questions like these. Each year, its faculty instructs more than 200 students in the art of packaging design.

“Our students are interested in developing real packaging for real applications,” said Dr. R. Andrew Hurley, assistant professor at the Sunoco Institute of Packaging Design and Graphics. He and his students value the VersaUV for its ability to print on a wide range of substrates, creating prototypes that are virtually identical to full production packaging.

They have run projects on plastic bagging material, thermoformable substrates, corrugated cardboard, and several types of paperboard. “The Roland prints on virtually any material, so when our students designed flexo packaging, we rarely had to worry about substrates,”

Hurley noted. “It was liberating knowing that our designs would come out perfectly on the final manufacturing material without having to print on roll stock, cut, glue, score and then have a smear or air bubbles. With the LEC-330, we were able to save time, money, materials and design according to our specifications, not to the limitations of our equipment.”

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*Dr. R. Andrew Hurley, Assistant Professor,
Sunoco Institute of Packaging Design and Graphics*

The Sonoco Institute of Package Design and Graphics is equipped with state-of-the-art facilities, including a cutting-edge prototyping lab. Among the lab’s current high tech equipment is a Roland VersaUV LEJ-640 64-inch UV inkjet printer. Originally, a LEC-330 was being used for the program, but the Institute recently replaced that model with a LEJ-640 to be able to print on thicker stocks such as corrugated boards.

According to Hurley, students leverage the VersaUV’s capabilities to run multiple iterations and then determine what works best for their respective projects.

“The results are stunning,” said Hurley. Using the VersaUV’s CMYK plus white and clear inks, students can reverse print with a basecoat of white ink, produce full-color images, and finish each project with unique patterns, textures and varnishing effects using layers of clear ink. “Elaborate textures and effects like these would be very expensive to simulate on other equipment,” Hurley noted.

In addition to students, the university serves more than 600 corporations who have worked with the Institute's faculty and staff to train their employees in digital design, as well as to take advantage of the Institute's comprehensive packaging design and testing process. The design and testing process begins with faculty and students working collaboratively with corporations to develop specific packaging designs and prototypes. Next, the Institute uses its own fully stocked grocery store to test the effectiveness of the packaging. Prototypes are placed next to competitors' products in the store aisles. Shoppers are given a list of products to purchase and are asked to wear eye-tracking glasses.

“Especially for the testing process, we rely on the VersaUV for its precision color matching and accurate registration to print realistic prototypes.”

*Dr. R. Andrew Hurley, Assistant Professor,
Sunoco Institute of Packaging Design and Graphics*

As shoppers make their selections, the inward- and outward-facing cameras on the glasses record the movement of their eyes, giving researchers a window into their cognitive process.

“Especially for the testing process, we rely on the VersaUV for its precision color matching and accurate registration to print realistic prototypes,” reports Hurley. “I am completely amazed by this machine. It fits in perfectly with our curriculum and allows the students to see the results of their work almost instantaneously.”

Rochester Institute of Technology's School of Media Sciences

For RIT's School of Media Sciences, VersaUV technology is equally important. The university is known for leveraging its state-of-the-art facilities to prepare graduates for careers in printing and publishing. RIT has been using a Roland VersaUV LEC-330, and the inclusion of this advanced 30-inch UV inkjet printer/cutter has helped to fill an important need in the school's curriculum and research.

“The VersaUV has generated a lot of excitement among the staff and students. It raises the bar with multiple colors and surface effects,” said Erich Lehman, Premedia Facilities Coordinator, RIT School of Media Sciences. “The students have used it to turn out some really innovative work.”

At RIT, Lehman and his students have the opportunity to test out the latest in printing technology from a variety of manufacturers. Students use the VersaUV to produce a variety of graphics, including packaging prototypes.

“We find the VersaUV incredibly valuable for teaching concepts for flexographic applications,” Lehman said. “It prints on a wide variety of flexo substrates, and since it prints white ink, we are not limited to opaque substrates. The VersaUV gives us the ability to take a student’s flexo project from ideation to realization.”

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Erich Lehman, Premedia Facilities Coordinator, RIT School of Media Sciences

RIT students often employ the VersaUV’s white and clear inks on their designs, creating gloss and texture. “The clear ink has been incredibly popular,” said Lehman. “Students enjoy using it to add texture and interest to their projects. They also enjoy experimenting with the wide variety of substrates that can be run on the LEC.”

Student packaging designs have earned top honors in the American Packaging Corp./Kraft Product Design Challenge at RIT. In the four-week challenge, students from the industrial and graphic design departments worked with packaging science students to create new packaging for familiar brands, including Planters Peanuts, Wheat Thins, Oreos and Nutter Butters. The teams’ formal presentations were judged by representatives from the sponsoring companies.

Professor Alex Lobos of the School of Industrial Design noted that having the VersaUV allowed the students to produce actual prototypes rather than appearance models. “This is a critical difference for the students as well as for the judges. The packages were created as designed, with nothing lost in translation,” said Lobos. He also credited the VersaUV with allowing the students to attain an additional level of understanding of the production process.

“Students were able to have a much deeper discussion about design and material choices for this project since they were printing on the final production substrate,” said Lobos.

“Printers like the VersaUV definitely represent an important facet of the industry’s future,” said Lehman. “It’s really exciting to have the Roland technology available and to see what the students are able to do with it.”

The Bottom Line

Digital UV-LED large format inkjets, such as those within the Roland VersaUV family, are ushering in a new era of package prototyping production. More and more package designers, printers and converters are adding UV inkjets to their pre-press operations as they learn how quickly and inexpensively these devices deliver prototypes that look exactly like the finished product using virtually any substrate, including flexible packaging, clear films and shrink wrap. This important transformation translates into competitive advantages that enable providers to delight existing customers, attract new business, and maximize efficiency.



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