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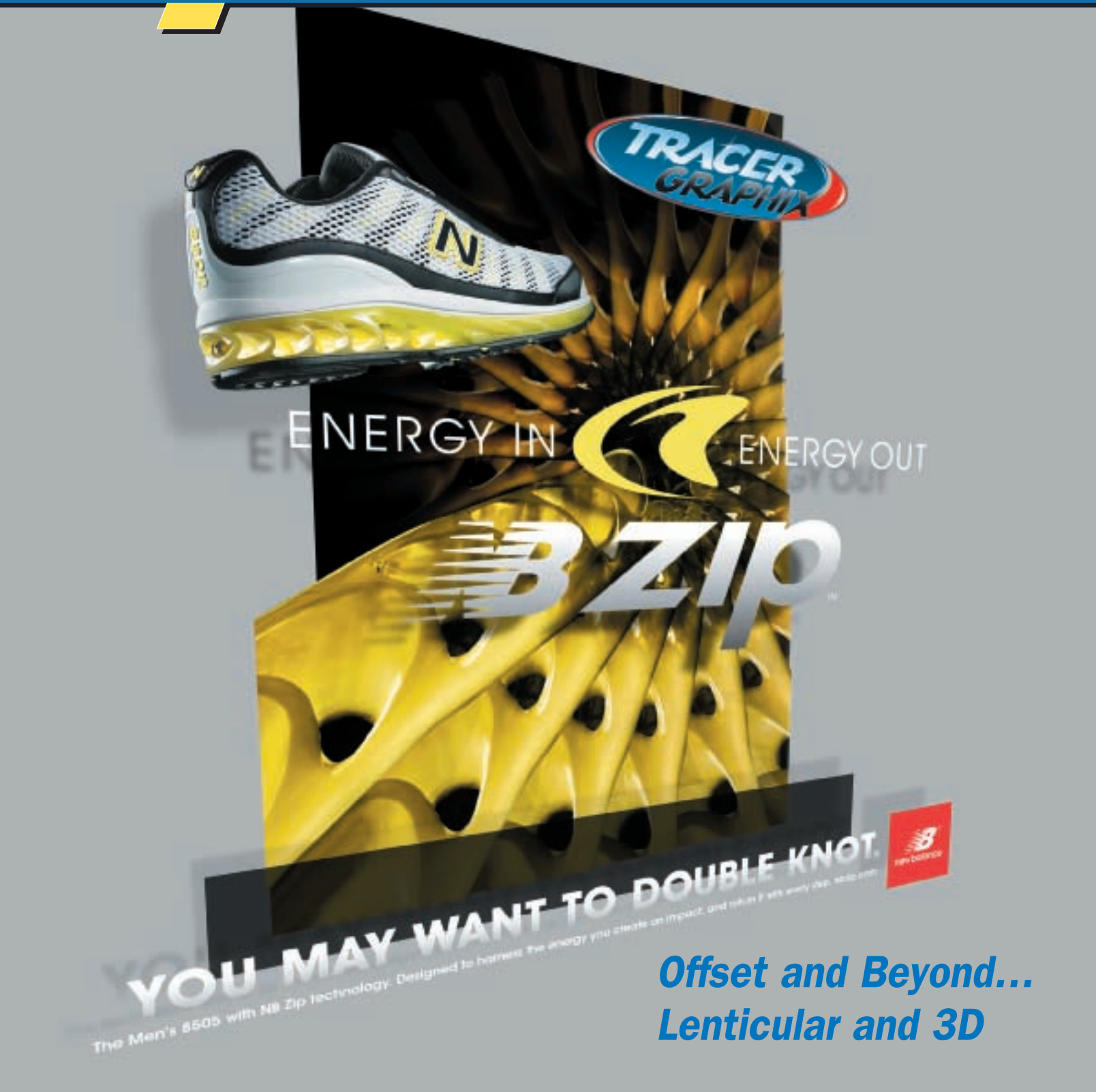


Offset and Beyond...
Lenticular and 3D

What's New in Offset Technologies

Lenticular Interest Grows

by Chris Travis, Director of Technology, KBA North America

Everyone has seen them and, most often, they can stop you in your tracks. Perhaps it is a 3D poster or a moving image on a postcard. Sometimes it is an image that morphs from one design to another. What am I talking about? Lenticular projects. Lenticular is one of the most popular and requested questions I get. Lenticular printing continues to be one of the most sought-after techniques to attract a customer's eye and provide value-added services to a printer's bottom line. It is always one of our most popular print samples and is an area in which we can assist our customers in moving forward to differentiate themselves in their marketplace.

What is lenticular? Lenticular printing is a special technique that involves printing an image on the back side of lenticular plastic, allowing the eye to simultaneously view alternating sections of multiple images to give the impression of 3D, zoom, morph, flip, or full motion.

The word lenticular is derived from the special material used for printing. Clear optical plastic is extruded into sheets with a series of very thin parallel lenses or lenticules on one surface. Lenticules are all the same size, are spaced equally across the sheet and vary in line-per-inch (lpi) frequency from 10 to 200, depending on the application. Lenticular sheets range in thickness from 0.008 to 0.385 in. The other side of the sheet remains smooth and serves as the printing surface. The individual frames that make up flip, zoom, motion or morph effects are interlaced using special computer algorithms. The resulting digital files are printed at extremely high resolution in precise register on the rear surface of the material. The tiny lenses focus on each of the printed frames in sequence as the viewing angle changes. Near objects appear to float in front of the printed surface, while distant objects appear to be behind it. The effect is exaggerated as you move your head from side to side or tip the sheet back and forth.

While the first early lenticular projects we know today began in the late 1920s, the method was first seen in 1692 by French painter G. A. Bois-Clair who used an autostereoscopic method to divide two or more pictures into "stripes" and align them behind a series of vertically aligned "opaque bars" of the same frequency, thus

The *GATFWorld* Cover

Dean Bjerke, Director of Sales for TracerGraphix, has been working directly with New Balance to refine the concept and design of a lenticular promotional roll out since mid 2006. As such, TracerGraphix underwent the process of taking a flattened 2D image and creating a multiple layer 3D image with volumetric depth. All of the volumetric 3D conversion, a process which took over forty hours to master, creates rounded layers that appear lifelike when printed vs. traditional 3D that can sometimes look like cardboard cut-outs. This is some of the magic that Tracer adds to the equation.

Once the files were prepped and proofed, TracerGraphix printed the images using Lithographix's KBA Rapida 205, an 81-in. six-color sheetfed press. The NB Zip Lenticular poster was originally conceived by the creative teams at New Balance and TracerGraphix. The NB Zip shoe itself has a colorful outer sole, which was then used as a repeated spiral vortex. This presented an opportunity to create an "infinite depth" effect (much like you would see if you were to look into two opposing mirrors).

According to Sarah Bogart, Marketing Services Coordinator at New Balance, "New Balance was looking for an eye catching, exciting way to appeal to our target market for NB Zip. We decided on lenticular, and we are extremely impressed with these posters, especially given that TracerGraphix had limited files to work with. The posters are currently being displayed in-store, both as posters and window displays, and I have heard nothing but rave reviews and positive feedback."

For more info on this cover, contact Steve Spiro, chief executive officer, TracerGraphix at steven@tracergraphix.com.

allowing a viewer to walk by his paintings and see a change from one picture to another. More techniques were introduced in the late 1800s and early 1900s. By the 1960s, advertising and marketing firms caught on to the appeal of lenticular.

According to a history of lenticular authored by David E. Roberts on www.lenstar.org, mass production became a reality on February 25, 1964, when a *Look* magazine issue featured the first ink-printed postcard-sized "parallax panoramagram." The black-and-white still life of the bust of Thomas Edison surrounded by some of his more famous inventions required a 1,000-pound camera, tracked in a programmed arc, to photograph. The manufacturing process involved printing the image using a 300-line offset press and a special technique for coating and lenticulating a thin layer of plastic on the image at high speed. The process, known as "Xograph," was developed at Eastman Kodak in Tennessee and was credited to Arthur Rothstein and Marvin Whatmore. Over 8 million copies were sold. *Look* magazine followed with a color lenticular on April 7, 1964.

Equipment Requirements

To produce a lenticular piece, printers need interlacing software for manipulating the artwork and enough computing power to handle the resulting large files, extruded plastic sheets of lens material, and prepress and press equipment capable of holding extremely tight tolerances. Printers can use either a sheetfed offset press, preferably with UV capabilities, or a digital offset press, like our Genius 52 UV. The maximum sheet size is 14 3/16×20-in., and it can operate at 8,000 sph. The press has a wide stock range in this format: from 60 lb. to 32 pt. KBA credits its waterless technology for exceptional makeready times and print quality.

The Mallard Press, a Lombard, Illinois offset and digital printer, added a Genius 52 UV press to produce lenticular pieces. "The Genius allows us to makeready in minutes instead of hours," says Bob Gay, president. "Just hang the plates, adjust register, and run. The waterless inking on the press allows us to print 370-line screen rulings to insure ultra sharp lenticular effects. Proofing lenticular files for other printers is becoming a popular request, because we can be on and off press within a half hour making a practical and cost effective solution for proofing the unknown."

In addition to a press, printers need a specialized lens. Different size lenses are used for different applications. For example, a 70/75/80/100 lpi lens is the most popular. These are used for small- to medium-size images being seen within an arm's length, such as postcards, promotions, business cards, or direct mail retail applications. A 60/62 lpi lens works best for creating small- to medium-size images for close-up viewing but can also be used for large format retail applications with viewing distances from 0.3m to 3m. A 40 lpi lens can generate up to two foot 3D depth from a 5mm lens. While it is ideal for point-of-sale/purchase, signage, and trade show graphics, it is not suited to flip effects. A 30/20/15 dpi is particularly suited for large format due to the vibrancy and high visual impact with superb viewing distances from 1.5m to 6m.

One of the leading lens manufacturers for lenticular is Pacur which produces a number of different lenticular lens designs. These include a 60 lpi for flip and animation; a 62 lpi for 3D images plus visual effects such as flips, morphs, and zooms; a 75 lpi for 3D, flip, animation, zoom, and morph; a 100 lpi for 3D, flip, zoom, and morph; and a newly-designed 100 lpi 3D lens that gives optimum depth with a viewing angle of 30 degrees and is 0.023-in. thick.

Finally, you'll need a lenticular software package to help with interlacing the image. There are many lenticular software packages available. Some can be found for free on the Internet, while others can cost as much as $2,500. "Advancements in software application make it much easier for printers to match the size of the lens to the correct image," says Bob Gay of The Mallard Press. Lenticular software manufacturers include HumanEyes and Photo Illusion. HumanEyes recently introduced its PrintPro 2.0 3D lenticular software solution and its latest innovation, Creative3D. Engineered specifically for the professional design marketplace, Creative3D is a stand-alone application offering design-centric tools for 3D and lenticular effects creation. Photo Illusion offers lens packs and lenticular software.

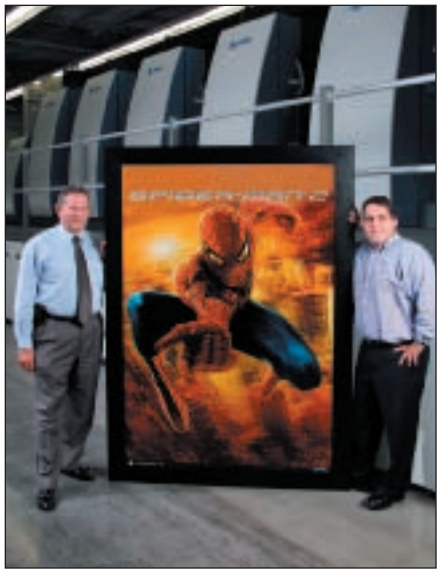
Prepress Issues

To make your lenticular project go as smoothly as possible, put a lot of valuable time into prepress. Bob Gay advises working with a lenticular artist who knows the nuances of each individual picture and has the experience to correct the image being used. Here are some tips in choosing the correct image: keep one simple background throughout the animation; avoid red to green, blue to yellow, and black to white; avoid strong vertical or horizontal lines; choose scenes with good color saturation; and use slight movement rather than overly exaggerated movement.

At the lenticular seminar at our headquarters we devoted a lengthy portion on prepress issues, including the art requirements and file preparation needed to produce a successful lenticular piece. Under the guidance of KBA Lenticular Specialist Rob Rudeski, the attendees learned about interlacing, the process of striping and arranging printed information to a given pitch to match a lenticular lens. They also learned about the available software, pitch testing (in which the exact count or number of lenticules per inch (lpi) is measured), and mechanical pitch—the exact and true physical pitch of a lens.

Training Issues

Our five-day seminar on basic lenticular printing is a professional development seminar held at KBA's



Herb Zebrack (left) president of Lithographix, Los Angeles, and Steven Spiro, CEO of TracerGraphix, pose with the largest lenticular sheet ever printed on a lithographic press.

headquarters and brings together KBA's lenticular, printing, and marketing experts with owners and press operators of the KBA Genius 52 UV press.

There are other places to turn for help and advice in producing lenticular pieces. In October 2004, we, along with a number of other firms, formed Lenstar.org, an industry group that serves designers, advertising agencies, brand owners, and their printers. Lenstar.org is dedicated to providing helpful information to raise awareness of lenticular's benefits within the creative community. The group offers a free lenticular effects presentation book at its website.

Another source is www.flipsigns.com, a trade association and lenticular software developer. Its website provides a variety of methods to produce lenticular and 3D images, the costs involved, and the necessary equipment.

Challenges of Printing Lenticular

But with all of its dazzle and eye-catching effects, lenticular is not an easy printing technique. Lenticular is more expensive, more difficult, more sensitive than plastic printing, and more prepress intensive. But don't let that stop you from using lenticular.

Printing a lenticular sheet presents the same obstacles as any plastic sheet. It's much less forgiving than paper and far more expensive. In an uncontrolled environment, plastic will shrink and swell. Moreover, plastic is nonporous—if you put ink on top of it, the ink doesn't sink in, it just sits on the surface. So, unless you have a UV press or other drying method, it will be slow going in the pressroom.

While it's possible to print lenticular on a conventional press, most experts agree it's much easier to use a UV-equipped model because of drying and adhesion to the substrate.

Bruce Hathaway, KBA corporate demonstrator, says "We showed seminar attendees the correct feeding and register techniques with a ten-sheet makeready. Then we demonstrated how to finish their lenticular jobs with opaque white or lamination and how to die-cut particular projects."

Another challenge facing printers who choose lenticular is timing—lead times and deadlines. In general, a lenticular project does take slightly longer than a traditional print project—from three to ten working days depending on the artwork supplied and including the interlacing, printing, and mounting to the lens. Much depends on what additional finishing or assembly might be required, and how much proofing and reproofing has to be done.

Opportunities

The opportunities to sell lenticular printing to your customers are immense. This is due to the fact that there are new high-quality printing lenticular lens material and new high-resolution prepress techniques and new UV presses, such as our Genius. New markets for lenticular printing include packaging, point-of-purchase, direct mail, collectibles, art posters, and large format jobs. Lenticular is being used to great advantage on business cards, billboards, custom mousepads, 3D effect posters, stamps, and cups. Emerging markets include flexible labels, thermoformed decoration, and pliable and machineable cover stock. Any marketing campaign can include a lenticular job and set the printer apart from its competitors.

Printers are taking advantage of their new-found lenticular markets. Last summer Los Angeles-based Lithographix, a high-end commercial printer, produced the largest lenticular sheet ever printed on a lithographic press—a 50 × 80-in. lenticular sheet on a KBA Rapida 205 81-in. sheetfed press that is a 3D poster of Sony Pictures movie "Spider-Man 2." The poster depicts Spider-Man in front of a city skyline crouched low and poised to throw a web. Using the 3D effect, it appears his right arm is going to pop out of the poster. The firms produced 350 posters using the lenticular technique.

Since the production of the super-large Spider-Man poster, interest has grown. Lithographix is marketing lenticular projects produced on the Rapida 205 press as "VLFX." "We recently produced another VLFX retail job for New Balance tennis shoes," says George Wolden, senior vice president of manufacturing at Lithographix. "The job called for a 47 × 65-in. poster of a tennis shoe in 3D, requiring great background creative to enhance the overall the 3D shoe effect. (See cover) We also recently produced a VLFX bus stop shelter for the city of Moscow, Russia."

Contact Chris at ctravis@kba-usa.com. For more lenticular information, visit www.lenstar.org or www.slipsigns.com. Visit Tracer Graphix website—www.tracergraphix.com.