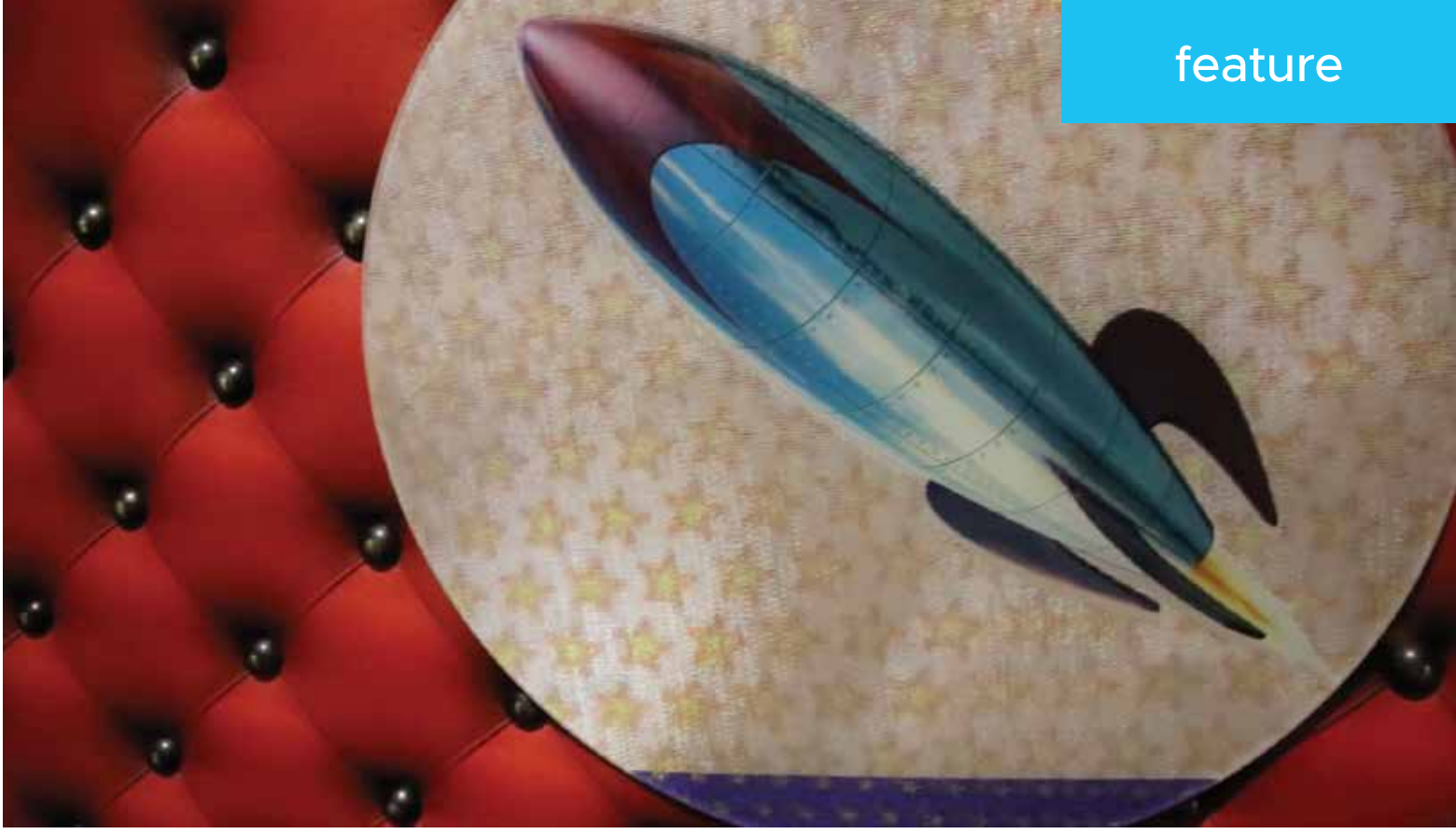

Courtesy of Agfa.

Transforming Printing with Optical Illusions

Innovative techniques captivating audiences and growing businesses

Over the past decade, improvements in wide-format technology, software and specialty inks have enabled print service providers (PSPs) to deliver new, dynamic options once only possible in traditional offset print markets. Service providers understand that every surface is an opportunity to get a client's message noticed.

This is just one of the reasons why versatile UV flatbed systems continue to grow in popularity; printers can create images on virtually any rigid substrate less than two inches high.

Today's advances in UV inkjet printing and the addition of varnishes, primers and white inks put PSPs in the position to create a wide range of special effects such as multilayer and textural printing. Unique, eye-catching output can be achieved by layering and isolating inks and varnishes at various points throughout an image.

In fact, "30% of the total color pages printed in North America and Western Europe, or nearly 1.8 trillion pages, receive some form of special effects enhancements or embellishments," according to the 2016 report "Beyond CMYK: The Digital Print Enhancement Opportunity," coauthored by Jim Hamilton, InfoTrends.

The following are some ways to achieve extreme special effects.

Varnish

Adding gloss to elements of an image can create an emotional connection for viewers. For example, imagine a picture of a bottle of soda. Gloss varnish can take an image from ordinary to "cool" with water droplets that appear to be sweating. This makes the image come alive and look more realistic, causing the viewer to look twice and connect with it.

Adding varnish to the crystal of a luxury wristwatch image can make the watch "pop" off the page. Luxury brand managers may invest more for this graphic if their logo is raised off the substrate with a varnish application. The ability to increase the density or thickness of varnish within the

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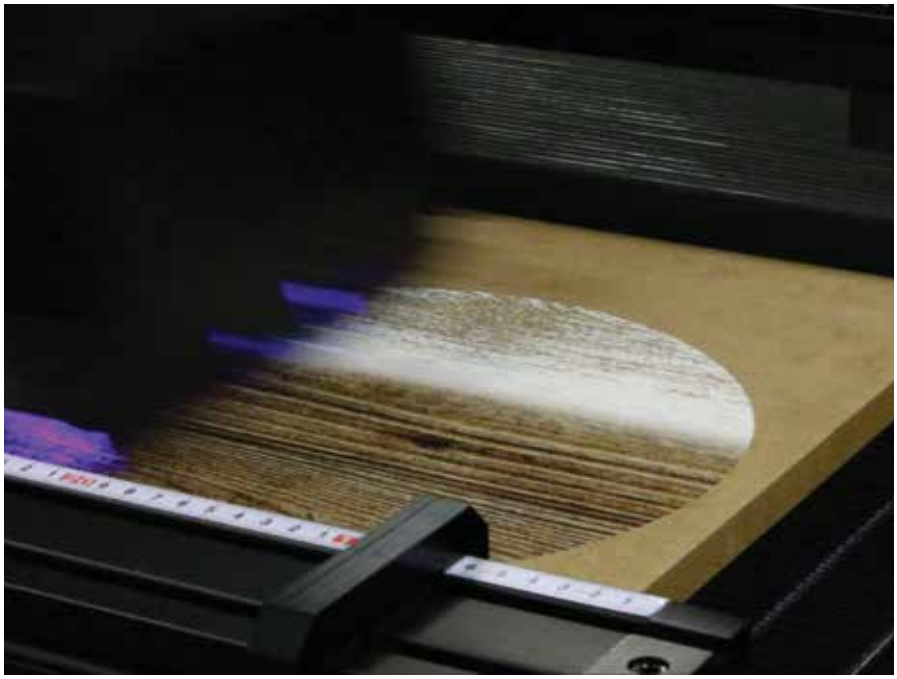
By Deborah Hutcheson, Director of Marketing, Agfa



Courtesy of Agfa.

graphic user interface (GUI) at print time allows users to control the density of the varnish effect.

3D Elevation with UV Ink

UV inkjet has capabilities that stretch the imagination. In a more sophisticated "art replica" application, a reproduction of an oil painting digitally printed on a flat substrate included the tactile "feel" of brush strokes and crackling paint. An automated approach using Photoshop manipulation helped create the artificial layers in a more cost-effective way.

Another example of this effect is creating a textural image of a brick wall. Using the same concept, the "height" of the brick can be built with one white channel, with a second white channel used to create the texture of the mortar. Color would then be printed over the white. Layering ink gives the image the feel of a real brick wall, including the porous brick and the coarse mortar.

As demand for more environmentally safe printing increases, it is now possible to provide 3D effects and print on media that is 100% recyclable in standard wastepaper recycling/re-pulping streams.

For PSPs looking to impress clients and grow their business, the reality of 3D applications is not only cutting-edge, but could be the key to greater profits and market differentiation.

The more unique a graphic appears, the likelier the target audience will engage in the experience and be moved to the call to action.

Lenticular-Style 3D Effects Make Images Come Alive

Lenticular printing technology has long been used to create 3D-like images with an illusion of depth, or the ability to change or move as the image is viewed from different angles.

However, lenticular technology is a multi-step process, creating a lenticular image from at least two images and combining them precisely with a lenticular lens.

Traditional lenticular images are produced using a plastic sheet that contains long, thin cylindrical lenses called lenticles. These lenticles are only millimeters wide or smaller. Beneath the lenticles is a printed sheet containing one or more images that have been sliced into tiny stripes the same width as the lenticles. They are interlaced such that each stripe lines up with a lenticle. The lenticles then refract the image so that from one angle you see one image, and from another you see a different one.

This imparts a 3D effect or a very simple animation.

Lenticular is a variety of what is known as autostereoscopic imaging, or "glasses-free 3D display." The challenge with lenticular imaging is that registration of the interlaced image to the lenticle sheet has to be precise, which can be a timely and costly process.

Today's wide-format flatbed inkjet systems eliminate the need for lenticular technology with advanced features like varnish and 3D effects. For example, a new 3D lens technology, introduced two years ago by Agfa, takes a slightly different approach to produce a 3D varnish effect without the need for lenticular substrates.

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Instead of printing on a sheet with long, thin cylindrical lenticles, it prints tiny transparent dots that function as tiny lenses, using a moiré pattern to impart a 3D effect to an image. And, rather than mount the printed image to a plastic sheet of lenticles, it prints the lenses directly using clear varnish. The 3D lens software interfaces with Agfa's Jeti Mira LED inkjet printer to produce layers of varnish that result in the 3D effect.

With this patented 3D lens technology and UV varnish, the substrate no longer dictates the animation effect. Using a combination of printed lenses composed of UV-curable varnish and image manipulations, the Jeti Mira LED adds depth or "movement" to print output by tuning the size of the varnish lenses and the array in which they are printed. Printing layers of varnish creates the height needed to achieve a 3D effect, eliminating the need for special lenticular media.

The 3D effect itself is governed by a combination of substrate thickness, lens size and lens height. Agfa offers three substrate thicknesses — 3, 5 and 9 millimeters — each of which has two different lens widths and six different depths.

Courtesy of Agfa.

Today's wide-format flatbed inkjet systems eliminate the need for lenticular technology with advanced features like varnish and 3D effects.

The lenticular effect requires a printer capable of extremely high resolution, accuracy and repeatability, as well as a varnish and a white channel. At the back of the substrate, a color image is printed based on a software-generated pattern, followed by a layer of white. Finally, a lens pattern is printed on the front of the substrate using cone-shaped drops of varnish. It is important that front and back are printed exactly in register.

Different combinations will yield different effects, from an image that "pops" out, or conversely, appears to sink into the background. Printing both the image and the lenses is estimated to take between 20 and 30 minutes, depending on how much layering is required to build the lenses to the correct height.

The smallest image that can be printed is about two inches by two inches, with the largest being the maximum board size of the Jeti Mira LED, which is about 106 inches by 60 inches.

At present, the effect works best on very simple images, like geometric shapes and vector images. Someone's face, for example, would have too much detail.

The effect adds depth to a flat image, or even causes the background to change color as the viewer walks past it. This process provides an easier way to add a lenticular effect to many different applications at many different sizes, including point-of-purchase displays, posters, trade show graphics, decorative prints and packaging.

With the latest advancements in inkjet technology, PSPs can add value to their printing, creating a full sensory experience for their customers.

Deborah Hutcheson, Director of Marketing for Agfa North America, is responsible for marketing and marketing communications for Agfa's portfolio of products. With almost 40 years in the graphic communications industry, Hutcheson has gained an in-depth knowledge of the industry with a specialization and focus in wide format inkjet and workflow. Deborah is also very active in the industry and has represented Agfa on a variety of committees, most recently serving on the Board of Directors for ISA.