

# Liquid Protection

BY DAVID KING

**W**hen you talk about liquid coatings you have to understand that all products that are liquid start as a solid and use a carrier to deliver the solids to the final surface.

Once coated the carrier is removed from the coating and you are left with a nice waterproof (often with UV protection) finish on your print.

In most cases the carrier determines what types of print can be coated with any given coating. The three most common liquid coatings/laminates today are solvent-, water- and UV-based.

## LIQUID HISTORY

Liquid coatings have been around for years in the printing industry but have traditionally been called *clear coat* or *varnish*.

The screen-printing industry has been using solvent-based clear coatings for years



Vehicle graphics made on e-stat machines (such as this one), require a transfer process and have traditionally been protected using film laminates. Some shops are using liquid coatings on e-stat vehicle graphics. (Photo courtesy of 3M)



Liquid coatings work well on fleet graphics made with today's high-speed, solvent-based inkjet printers. The coatings are compatible with the new, softer vinyls employed. (Photo courtesy of Castle Graphics)

and can achieve more than five years of UV resistance with UV screen inks and UV clear coats.

As the large-format printing industry slowly moved to digital printing it moved away from solvent-based liquid coatings to hard film laminates (pressure sensitive and thermal films with an adhesive layer).

Today, film laminates are a major part of the digital printing industry. Most laminated inkjet and e-stat prints are laminated with some kind of film laminate.

However, film laminates are not *always* the best solution for digital graphics. Let's look at some of the uses for liquid coatings.

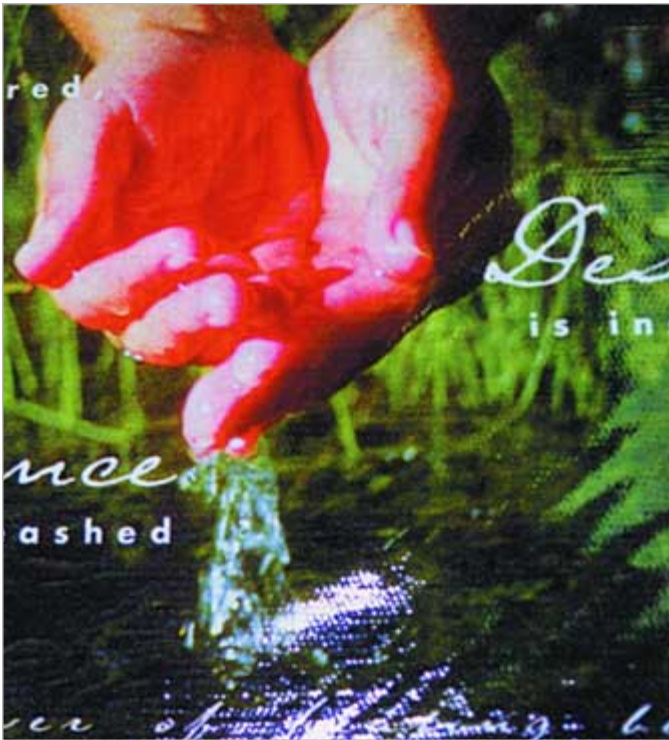
## INKJET PRINTS

Most inkjet prints are produced with aqueous-based inks. The carrier in the aqueous ink is water. Prints can be fragile and often need a laminate to protect them from smudging, fading and from moisture.

You would *not* want to use a water-based



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One advantage of liquid laminates is the fact that they allow the texture of the substrate to show through while helping the colors to pop, as with this canvas banner. (Photo by Norm Gobert)



Castle Graphics realized significant finishing cost reductions when the shop started using liquid coatings. (Photo courtesy of Castle Graphics)

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Royce Bair, director of The Stock Solution in Salt Lake City, poses with several canvas reproductions of religious paintings. Many shops prefer liquid laminates to protect their fine-art prints. (Photo courtesy of The Stock Solution)



Liquid coatings are available in spray-on, roll-on and brush-on forms as well as forms intended for use with automated coating machines. Brush-on coatings avoid the heating process associated with many coaters, but take about 48 hours to dry and cure.

By Molly Joss

liquid laminate to protect inkjet prints made with aqueous inks because the laminate and the inks would interact and ruin the print.

Inkjet prints can be protected with traditional film laminates, but water-based liquid coatings will not work. However, solvent-based coatings used in the fine art market (see accompanying sidebar), and UV-based liquid coatings will work. Solvent-based coatings don't react with water-based inks, and UV-based coating systems employ a UV-activated liquid that dries instantly when the coated print is run under a UV light source.

The coating dries and cures before it has a chance to react with the ink. UV-based systems can coat just about any type of print.

## ELECTROSTATIC

Electrostatic prints are produced with toner that tends to be comparatively flat in color. E-stat prints are often laminated to give the image's color more pop.

E-stat printers use a transfer process to get the image from the paper on which the image gets printed onto the vinyl that is going to be used for the application — commonly used for fleet and wall graphics. The vinyl is then laminated and the graphic applied to the substrate surface.

If the process is done correctly the laminate sticks to the toner, sealing the vinyl, increasing UV resistance and making colors pop.

However, if done incorrectly, the overlam can delaminate from the vinyl, causing the image to fail. Because toner is dry when it is laid down on the substrate, most over laminates work fine, both film and liquid types.

Most toner used in e-stat printers has a UV inhibitor built in, so some over laminated e-stat prints can offer a guarantee for more than five years. For e-stat prints liquid coatings are used most frequently for short-term graphics, while film is employed for long-term applications.

The cost of a short-term liquid coating is

about five cents per-square-foot, 15 cents for five year. However, a five-year Teflon film laminate goes for about 78 cents per-square-foot.

To give you a better idea, when Castle Graphics started making banners with its e-stat printer (1996), production costs ran at about \$1.50 per-square-foot. After using a wet separation system and liquid laminates, material costs were reduced to 38 cents per-square-foot. Fleet graphics costs have fallen from \$2.51 per-square-foot to about \$1.30 per-square-foot with liquid laminates and the new processes.

## DIRECT PRINT

Today's newest fleet graphics printing technology employs high-speed, solvent-based inkjet printers that use heat to warm up the vinyl.

The solvent-based ink actually eats into the vinyl, and the heaters on the printer help to evaporate the solvents from the ink, leaving a very bright and bold print on the substrate.

Using film laminates over these new inks has proved problematic, however, partly because the new substrate vinyls are softer while the over-laminates tend to be comparatively stiff. This creates a problem when vehicles have a lot of compound curves because the laminate pulls away from solvent ink prints.

Liquid laminate does not present this type of problem because it is not as rigid as a film laminate. However, in a lot of cases the adhesive-backed vinyl for vehicle graphics needs to have a pre-mask added so the vinyl will not stretch when being installed.

Speed is another consideration. Film laminate can be applied at about 20 linear-feet-per-minute, but liquid can only be applied at about three linear-feet-per-minute.

The liquid laminate solution works best with the new direct imaging inks. The success of the new vinyls with liquid laminates more than makes up for the slower speeds of the liquid coater and premask.

Liquid coatings have become increasingly popular with fine art reproduction houses, especially those that use canvas or some other fabric as an imaging substrate.

That's the case with Aesop Images, Inc. in St. James, N.Y. Co-owner Michael Petroske says that unless the print is going to always be under glass, it needs to have some kind of protective coating applied.

Petroske says his company looked at several application systems and methods before deciding on a roller-based application system.

They had considered several systems with dryers attached, but Petroske didn't like the idea of applying heat to his valuable Iris prints. "I'd rather not bake them if I can help it," he says.

Newly coated prints take about 48 hours to cure and dry, so Petroske purchased a rack that allows him to stack about 50 prints at a time vertically so they don't touch each other while drying.

He cautions against stacking or rolling newly laminated prints before the coating has fully cured and dried — no matter what kind of liquid laminate is applied — because of the danger of prints sticking together.

For Royce Bair, director of The Stock Solution in Salt Lake City, the UV protection of liquid coatings is also a high priority. The company produces a wide variety of fine art and decorative prints, including some custom ink jet prints.

To give paper prints, and in particular watercolor papers, a protective coating after imaging, Bair uses a spray-on product.

"It protects the print from UV, water and scuffs, but it doesn't change the appearance at all," Bair says. "We put a thin coat on watercolor prints because we want them to have a dry look."

For other paper prints and canvas, Stock Solution uses a product specifically made for use on canvas.

"It's a coating that will definitely change the surface," he says. "The glossy will make it glossier — but there are also satin and matte finishes available."

Sometimes he enhances fine art reproductions by adding "brush strokes" onto a canvas print. Bair has been working with a new brush-on product that comes in a satin and gloss finish. You brush on the laminate, not only to protect the print, but also to give it the look of a hand-done print. "The purpose is to create brush strokes with the laminate that mimics the brush strokes of an original painting," Bair explains.