

UV Waterless Printing... Where Is It Now?

By Eric Friedman, George McGill and Chris Travis

As the graphic arts industry continues to look for more green processes, waterless printing remains at the top of the list as a fast-growing and popular method for printers.

What is waterless printing? Waterless printing is an offset printing process that eliminates the water or dampening system that is used in conventional and UV printing. A unique silicone rubber-coated printing plate, waterless inks and a means of temperature control on press are all components of a waterless printing process. Many printers have been drawn to waterless printing because it eliminates dampening-related volatile organic compounds (VOCs) from the printing process. In addition, waterless printing offers quick roll up, faster make-ready times and less waste of costly substrates. Also, chemically tainted waste water from traditional lithographic printing is eliminated. With an ever increasing demand from customers to be greener, waterless printing is an option many printers are taking a closer look at.

In waterless printing, the printing process involves exchanging chemicals—such as commercial fountain solutions, isopropyl alcohol or its substitutes—for a simplified mechanical process. Instead of the press operator balancing the delicate relationship between ink and water, waterless printing simply requires a temperature range for successfully transferring ink onto the substrate.

On the prepress/design side, waterless makes the process simpler as well. Dot gain is reduced due to the elimination of water; therefore photographic detail is better rendered. Another bonus is that higher densities broaden the color gamut and generate more saturated color.

Waterless printing requires control of the temperature of the printing plate and the press. For waterless and normal lithographic UV inks, it is recommended that individual temperature controls are in place on the press for additional control of the inks. This is especially true with UV inks. These inks are more sensitive to temperature as compared to conventional inks.

Plate manufacturers have made many significant advances in the technology for waterless printing plates. Traditional offset plates—which are processed using developing solutions with strong alkalis—degrade rapidly and require frequent replacement causing significant industrial wastes and expense. Toray waterless plates, for example, are imaged in traditional 830nM thermal platesetters and adopt primarily a water development system. The developing solution is regular tap water. The pretreatment and after-treatment solutions are all contained and recirculated within the processor and

FIGURE 1

Waterless prints sharper

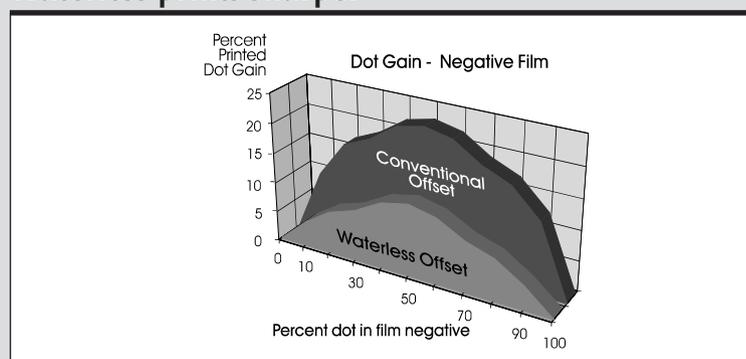
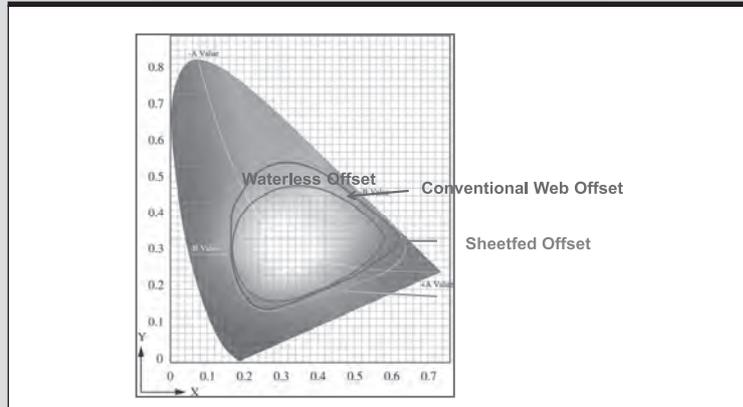


FIGURE 2

Waterless yields wider L*a*b color space by 20%



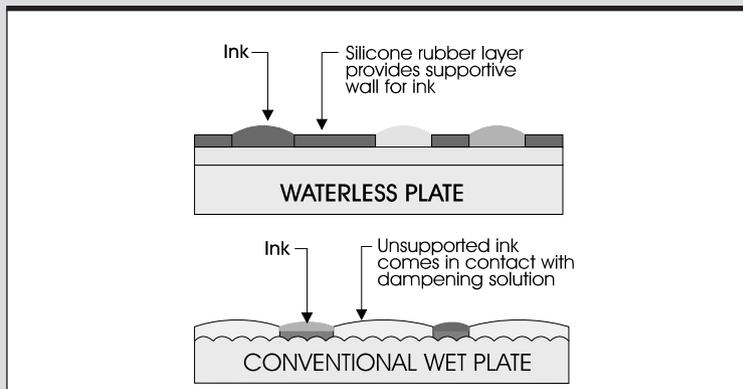
require infrequent replenishment. Therefore, liquid industrial waste output is reduced by up to 80 percent.

Also, it is now a standard procedure to print energy-curable waterless inks with a press temperature between 24°C and 36°C and even up to 40°C. On some special applications the plate temperature is between 12°C and 15°C. This gives the printer the ability to print cleanly on many different substrates with the characteristics normally expected from the lithographic process. Currently, waterless printing inks are used to print most

commercial work on both paper and synthetic stocks with applications ranging from labels to well over 40-inch wide formats. The inks for specialty applications include labels, CDs, DVDs and plastic cards. These inks can be formulated to accept lamination for the secure card and related industries. UV waterless inks are a perfect fit for the packaging market where bright colors are necessary. Instant cure of these inks deliver, as with lithographic UV inks, lower dot gain in a dry trap situation along with almost nonexistent VOCs from the printing process.

FIGURE 3

How waterless works



These applications are only going to expand as future work on ink formulation, plate and press design continue to progress.

Many manufacturers have developed presses to encourage the use of waterless printing. One particular manufacturer, KBA, markets an innovative ink train design for waterless printing that eliminates ghosting, relieves the operator of setting ink keys and is up to color in a fraction of the time it takes conventional machines.

The unique, temperature-controlled Gravuflo inking unit has no ink keys, and brings the press into color extremely quickly. Make-ready times and waste are reduced to a minimum. Even with high-volume jobs, or split runs printed simultaneously at different locations, constant printing quality is guaranteed.

This inking unit concept is characterized by its high ink uniformity and process reliability. This process quickly achieves optimal inking and constant production run quality. Make-ready times and startup waste are minimized as a result of the quick response speed of the inking unit. The diameters of the ink form roller, plate cylinder and blanket cylinders are identical to ensure ghosting-free printing.

Virtually all printing presses can be equipped with the technology to be able to print waterless at a very low cost. Temperature-controlled ink vibrators have been standard on most of the larger (26"-40") presses for the past 10 years.

All that and even more innovations—some recently seen at drupa 2008 in Düsseldorf—will continue to drive the use of waterless printing. ■

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