



Ink Impact

Reducing the environmental effect of inks while improving the print process.

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Press operator Becky Overland adds fresh ink to a job on one of Bell's three flexo presses.

There are several options for folding carton and corrugated container converters looking to use greener inks and printing practices. Making the transition has advantages that go far beyond the environmental benefits. Not only does it help mother earth, but it can also be a marketing tool to attract new customers and retain current customers that are looking for more sustainable packaging options. And in many cases, the transition to more environmentally friendly inks can be seamless and doesn't have to cost more than what you are already paying for inks.

For Bell, Inc., a Sioux Falls, S.D.-based folding carton converter, incorporating water-based inks into its overall growth strategy has paid off.

"We realized early on that more and more of our customers would be looking for companies that can demonstrate sustainable practices, so this was essential to our growth strategies," says Ben Graham, Bell's vice president of finance, sales and supply chain.

In the early 90s, the folding carton company had big plans for growth. They decided to become a 100 percent water-based flexo operation. One of the key factors of that decision was the polluting quality of most inks. Water-based inks are safe enough to wash down the drain.

The company went from having one plant and two conventional offset presses back in the early 90s to a more than six-fold increase in capacity today. The company now has two plants and four web presses with inline diecutting. Three of the presses are water-based flexo presses. About three years ago, the company purchased the first Drent Goebel Variable Sleeve Offset (VOSP) press in North America and introduced electronic beam (EB) inks into its operations. Using the EB inks allows fast drying without having to resort to using conventional inks that are more harmful to the environment.

According to Graham, contaminants emitted in the drying processes required for conventional inks are entirely absent at Bell and the company emits no harmful gases in its printing processes. In addition, there is virtually no ink waste stream on the VSOP.

Despite the company's predominant use of water-based processes, it maintains that the EPA's National Pollution Discharge Elimination System classifies Bell's use of water as "minor."

Getting Started

There are steps converters can take right now to reduce the environmental impact of their inks and implement more sustainable ink procedures at their plants. And making the switch doesn't mean compromising quality.

"It is not uncommon for converters to assume that there must be a trade off of productivity of efficiency when making a transition of this type," says Matt Fassler, director of corporate services, Graphic Sciences Inc., Portland, Ore.



CR's Graphic Resource Center is staffed by chemists experienced in formulating environmentally friendly inks. Sustainable plant-based materials are used due to their good performance characteristics and availability.

In fact, he says the opposite can be true. "We are finding that some of our new generation environmentally friendly inks have helped to improve overall productivity and print quality, especially in the display/POP (point of purchase) market segments."

It all really depends on the amount of sustainable materials in a given ink formulation. Acrylic polymers made from petroleum-based derivatives are still dominant in the flexographic ink industry because of their ability to perform. Fassler says that while inks made strictly from sustainable materials generally aren't as versatile as traditional flexographic inks, the technology continues to be developed and improved.

George Sickinger, president and ceo, Color Resolutions International (CRI), Fairfield, Ohio, agrees. He points out that many flexographic inks that used plant-based resins such as gum rosins, tall oil rosins, fatty acid esters and soy polymer were discontinued because they were unstable. But with advancements in chemistries, he assures converters that they can have a stable system with plant-based inks.

Companies can reduce volatiles released into the atmosphere and use inks that are based upon renewable resin technology. Just switching from solvent inks to water-based inks can go a long way in reducing the environmental impact, Sickinger says. Solvent based ink contains 40 to 50 percent Volatile Organic Compound (VOC), while water-based inks contain 5 percent VOC or less. Most water-based inks contain less than one percent VOC.

One product that has gained national recognition for its use at Vanguard Packaging in St. Louis, Mo., is Eekoflex. This brand of inks and varnishes by Cincinnati-based BCM Inks uses pine tree rosin to replace petroleum-based acrylic resins in standard water flexo inks.

"We've found that it's been able to perform the same or better than some of the petroleum-based or resin-based products," says Robert Callif, vice president of operations at BCM.

It has been shown to reduce dryer usage on presses by 25 percent. Callif has found that the Eekoflex has more price stability than petroleum-based products. The company has also tried manufacturing soy-based inks, but found it had drawbacks in price, shelf-life, and printing quality.

Determining the Best Approach

What is best for one company may not be the best approach for another. Callif suggests converters learn as much as they can before making a decision. He advises that converters "get on board the sustainability train," if they haven't already. "It can lead to new business or it can mean keeping their current business." BCM keeps changing more and more customers over to its Eekoflex products.

Graphic Sciences' Fassler suggests individual companies figure out what role inks play in their overall sustainability program. This, Fassler says, is vital in establishing attainable goals.

"Having defined this role, a company can work closely with its ink supplier to identify the proper products and practices that suit its individual business environment," he says. "Those that are striving to reduce their impact on the environment should speak openly with their suppliers to truly understand what makes one product more 'sustainable' than another."

Graphic Sciences has seen the improvement from an environmental standpoint from customers who have transitioned to its "new generation inks." They include the ability of inks to stay open longer for extended press runs, improved heat resistance, better resolubility and rewet characteristics, and reduced use of additives.

"We have also noted increased transfer and faster press speeds due to the ability to run a thinner ink film," Fassler states.

Sun Chemical, Parsippany, N.J., has begun offering environmental evaluations to its customers through its SunCare Environmental Services (ES). Through this program, SunCare experts will evaluate the carbon footprint of a plant and help companies develop a carbon management strategy to reduce carbon emissions and costs.

Plans are in the works to have tools available on Sun's website, www.sunchemical.com, where converters can go and conduct their own evaluations. Michelle Hearn, Sun's director of North American inks, says when it comes to the environmental impact of inks; it really boils down to evaluating the products and the process.

And all processes and products have pros and cons. Both water-based and UV inks significantly decrease the VOCs released into the atmosphere, but solvent-based inks also have some environmental benefits in the amount of energy it takes for the inks to dry, Hearn says.

Reducing the Environmental Impact

Perhaps, as a company, you aren't ready to take the plunge into completely changing your inks. If this is the case, there are still plenty of steps you can take at your plant to become more sustainable when it comes to your inks.

CRI's Sickinger suggests ordering ink more efficiently. To do this, estimate the amount to be used and don't over-order. Larger companies should consider in-house blending so that they can make exactly what is needed. They can make more and don't have the fear of running out.

Converters looking to reduce the impact of their current inks can focus on a number of options, such as reworking leftover ink for future jobs, or capturing and treating waste water to make a positive impact, Fassler says. They can find a recycling program for their used ink containers. Converters can also work with their customers to develop a recycling program of press returns and dormant colors.

"A variety of practices can be put into place to reduce environmental impact from a utilization point of view, from reducing the use of additives on press to buying ink in bulk reusable containers," Fassler says.

Being more environmentally conscious has certainly paid off in many areas at Bell. Not only have the steps the company has taken been safer for the environment, it's also created a safer workplace and has reduced costs. Waste streams have been minimized or eliminated, while the supply chain has become safer and uses less raw material and fewer resources.

"Looking back, we realized the importance of that strategic decision," Graham says. "It has helped us build a sustainable and safe operation, which we believe has, in turn, helped us attract world-class customers and exceed our growth goals."