

Eco-Friendly Inks

Meeting Industry Standards & Consumers' Needs

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Skepticism reigns supreme when the words “sustainable” or “green” get bantered around. Research by Asia Pulp & Paper found 56 percent of U.S. consumers want more sustainable packaging and 42 percent also said they would pay more for it.

Consumers today are savvier than ever. They now have all kinds of hard data and information right at their fingertips to investigate whether a green claim is true or not. A study published by the *Journal of Global Responsibility* in February 2016 indicated consumers who reported having high environmental concern want to buy green products, but are not confident in the accuracy of green claims made by brands.

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Working with printers that strive for sustainable packaging is well worth the effort when meaningful eco-efficiency data can be shown to consumers as proof of green practices. This type of data will go a long way toward building trust and loyalty among consumers.

Industry programs, such as the Sustainable Green Printing Partnership (SGP), certify printing facilities' sustainability best practices, offering a third-party validation for the eco-efficiency and regulatory compliance efforts of converters.

Packaging printers, in particular, have to show a willingness to follow the guidelines and standards set by global retailers like Walmart, Target and Home Depot. These companies and others make it a priority



A biorenewable ink is derived from tree, plant, insect and/or animal materials. These can include resins, gums, oils, waxes, solvents and other polymer building blocks.

Photos courtesy of Sun Chemical

to partner with brands that utilize printing converters who integrate environmentally friendly practices.

In fact, much of the design and standards for packaging today is driven by retailers. Walmart, for example, wants packaging that is safe, affordable, recyclable, optimized and promotes sustainable chemistry. Target expects packaging to meet the guidelines of the Environmental Protection Agency's (EPA) Greener Living sustainable packaging program, utilizing recycled or renewable content and no chemical of “high concern.”

There are also many ecology-focused nonprofit citizens' groups leading the charge for environmental changes. Non-government organizations (NGO), such as Greenpeace, Sierra Club of America, Ceres and World Resources Institute, are strong advocates for certain environ-



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mental positions and help consumers and businesses alike recognize the need to change certain behaviors to become more sustainable.

Most printers already work under extreme pricing and profitability pressures and are always looking for ways to be eco-friendly, cut costs and keep expenses to a minimum. Reducing paper waste, lowering volatile organic compounds (VOCs) used in the pressroom, and using eco-friendly inks are just some of the ways converters are cutting costs while also becoming more sustainable.

DEFINING A “SUSTAINABLE INK”

A converter's definition of a successful sustainable ink could be as simple as how well the ink and materials interact with each other to synergize the printing process. For example, inks that improve productivity on press or reduce waste could be seen in a converter's eyes as green. That definition, however, is quite nebulous.

According to the National Association of Printing Ink Manufacturers (NAPIM), a biorenewable ink is derived from tree, plant, insect and/or animal materials. These can include resins, gums, oils, waxes, solvents and other polymer building blocks.

NAPIM's biorenewable content program assigns an index number that gives an independent verification an ink contains a certain percentage of biorenewable content. An index number of 60, for example, means the ink contains 60 percent biorenewable content.

The three key regulatory terms that are commonly used in the packaging industry are biodegradable, biorenewable and eco-friendly. The EPA's definition of biodegradable is the ability to be broken down by microorganisms. Paper, wool, cotton and foods generally fit this definition, while plastics such as polyester do not.

Biorenewable materials can include tall oil fatty acids from pine, cellulose from wood and modified biodegradable products to make biorenewable materials. Eco-efficiency refers to sustainable materials management for packaging. Many programs, like the U.S. Department of Agriculture's BioPreferred Program, offer incentives for businesses to increase the usage of renewable agricultural resources in their products.

To meet all of these regulatory requirements, retailer expectations and consumer demands, packaging inks are expected to be eco-friendly, biorenewable and biodegradable.

It is important to note that an ink could be biodegradable, but for the converted packaging to be considered biodegradable, the printed sub-

strate must also share that trait. Inks that use a very high percentage of biorenewable materials and are printed on such a substrate could also be considered compostable, with the appropriate testing.

Inks that meet these requirements should be free or only have trace levels of heavy metals and reduce VOCs that are released in the atmosphere. They certainly shouldn't include any EPA designated toxins, such as mercury, polychlorinated biphenyl (PCB) and chlorofluorocarbons (CFCs).

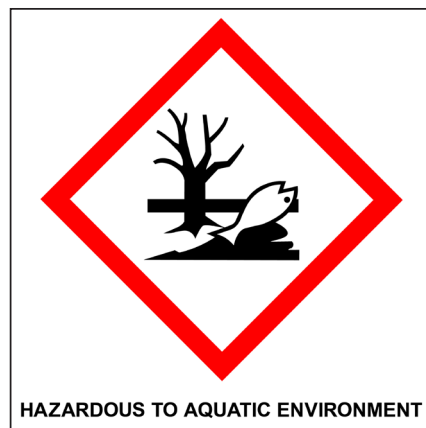
PROTECTING THE PRESSROOM ENVIRONMENT

Another concern printers face regarding environmental stewardship and inks is the management of chemicals of concern (CoCs) within a pressroom. The EPA contains lists of CoCs that have limitations, monitoring and reporting requirements. VOCs are examples of indoor environmental hazards that also need to be controlled. Inks, coatings, fountain solutions, press washes, plate processing chemicals, aerosol sprays and conditioners all are potential sources for VOCs.

Total allowable VOCs are regulated regionally and by the EPA, and each component used in a pressroom has a safety data sheet that lists specific VOC levels. In North America, the Environmental Protection Agency uses EPA Method 24 as the lab test protocol required to help chemical producers report VOC percentages related to printing.

Some ink companies have taken their own eco-efficiency approach by looking at the environmental impact associated with the manufacturing of their products, starting with an analysis of the raw materials consumed and fine-tuning manufacturing processes to reduce their carbon footprint.

One of the techniques being used by companies to help understand environmental impact is a lifecycle assessment. These analyses address the environmental



The biorenewable content program developed by the NAPIM assigns inks with an index number to indicate what percentage of the ink contains biorenewable content.

aspects and potential environmental impact of a product's lifecycle, from raw material acquisition and production to customer use, and sometimes can include final disposal.

These assessments can help ink manufacturers provide meaningful data to printers that they can report on their effort to be eco-friendly. Some of this data could help quantify the greenhouse gases associated with the ink's manufacturing and distribution phases of the product lifecycle and determine the carbon footprint for key products. It is also useful in helping ink manufacturers identify areas to target for improvement, such as water consumption, emissions and waste.

Partnering with an ink manufacturer with such data and low VOC solutions will go a long way toward helping achieve pressroom eco-efficiency goals.

PRINTING GREEN

In order to comply with all the various industry sustainability demands, package printers should engage with ink manufacturers who strive to work with suppliers who can provide raw materials that will ensure a "greener" ink. Some ink companies have responded to the industry challenges by rolling out inks that meet all the eco-friendly, biorenewable and biodegradable standards the industry, retailers and consumers are looking for.

Some flexographic and gravure solvent-based inks, for example, feature naturally derived resins and additives and are meant for surface printing on biodegradable films. These inks should conform to the North American standard, ASTM-D: 6954-04, contain low levels of heavy metals, use a selective pigment range, utilize existing color concentrates to provide a comprehensive color palette, and provide excellent adhesion and non-blocking properties on biodegradable films.

Other water-based inks are formulated with high levels of biorenewably sourced resins and can deliver the required critical performance attributes needed across a range of paper packaging applications.

These inks should be formulated with significantly higher levels of biorenewable resin content compared to other market offerings and blendable with standard water-based pigment dispersions that do not compromise end use or on-press performance. Inks that meet these standards should naturally also offer outstanding print fidelity and resolvability on press, quick setting for inline converting and high levels of resistance properties to rub, abrasion, water and grease.

SUSTAINABLE INK

Reducing the environmental impact of packaging is something everybody wants, and brands, retailers, printers, suppliers and consumers alike are all taking important steps forward to ensure packaging is green. While there is uncertainty in the marketplace about what a "sustainable ink" is, ink suppliers can play a role in helping printers, brands and ultimately consumers meet the eco-efficiency standards and expectations that have been set in the industry by regulators and NGOs. ■

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Regulations require ink manufacturers to abide by the global harmonization of labeling, which would include globally recognized hazard symbols.