

Going Beyond Environmental Claims

Sun Chemical's Eco-friendly Products, Combined with Responsible Manufacturing, Can Help Printers and Brand Owners Achieve Sustainability Goals

Introduction

Being "eco-friendly" can certainly be good for business.

After all, 56 percent of U.S. consumers want more sustainable packaging, according to research by Asia Pulp & Paper. In fact, 42 percent of respondents said they were willing to pay more for sustainable packaging.

But consumers today are savvier than ever, with all kinds of hard data right at their fingertips to investigate whether a green claim is true or not.

Brands need to do more than simply use phrases like "green," "environmentally friendly" or "sustainable" in their marketing. If a brand takes dedicated steps to vet and study in depth the environmental practices implemented by their suppliers and partners, they will be rewarded by consumers.

Printers find that striving 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 Printers Partnership, 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/Asda, toom Baumarkt, Real, Target, Praktiker and Home Depot. These companies and others make it a priority to partner with brands that utilize printing converters who integrate environmentally friendly practices.



working for you.

In fact, much of the design and standards for packaging today are driven by retailers. Walmart/Asda, for example, wants packaging that is safe, affordable, recyclable, optimized, and promotes sustainable materials. Target expects packaging to meet the guidelines of the Environmental Protection Agency's (EPA's) Greener Living Sustainable Packaging Program, utilizing recycled or renewable content and no chemical of "high concern." REWE Group, the parent company of German-based retailer toom Baumarkt, draws on internationally recognized standards, such as the United Nations Global Reporting Initiative, and formulates its own requirements as part of its guidelines to suppliers.

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

Using printing inks as an example, 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.

The three key regulatory terms that are commonly used in the packaging industry are **biodegradable**, **bio-renewable**, and **eco-friendly**.

Figure 1 The National Association of Printing Ink Manufacturers' Biorenewable Content (BRC) program assigns inks an index number which gives an independent verification that an ink contains a certain percentage of bio-renewable content.



Biodegradability is the ability of a material to be broken down by microorganisms. More relevant for sustainability is compostability, where that microorganism breakdown occurs within a set time, and with the important parameters of water, oxygen, and temperature defined.

Unlike industrial composting facilities (temp 55°C to 60°C, EN13432), home composting conditions refer to environments where products compost at lower temperatures so they can go into any ordinary compost heap at home. The temperature in a garden compost heap is lower and less constant than in an industrial composting environment. This is why composting in the garden is usually a more difficult, slower-paced process.

According to the USA National Association of Printing Ink Manufacturers (NAPIM), a **bio-renewable** 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 (BRC) program assigns inks an index number, which gives an independent verification that an ink contains a certain percentage of bio-renewable content. An index number of 60, for example, means that the ink contains 60 percent bio-renewable content. For the purposes of the BRC program, NAPIM also considers water as a renewable component in an ink.

For many years, the European Printing Ink Association (EuPIA) members have operated to an industry-voluntary "exclusion list for printing inks and related products." Initially focused on the protection of the health and safety of personnel at printers in the workplace, it has now been extended to cover environmental protection issues. The European REACH Regulation (EC) 1907/2006 requires that all substances on the European market be assessed for their impact on human health and on the environment. Appropriate measures to ensure all uses are safe to human health and to the environment must be introduced. Bio-renewable materials can include tall oil fatty acids from pine, cellulose from wood, and modified biodegradable products to make bio-renewable materials.

Eco-efficiency refers to sustainable materials management for packaging. Many programs, such as the U.S. Department of Agriculture's **BioPreferred® Program**, offer incentives for businesses to increase the usage of renewable agricultural resources in their products.

Most of Sun Chemical's sheetfed offset inks contain a high proportion of renewable raw materials derived from wood and vegetable oil sources, such as soy, rapeseed, sunflower, or coconut. The degree of renewable carbon can be assessed by the C14 test method, which is usually used to determine the age of historic findings. According to this test method, most of Sun Chemical's **SunLit®** and **SunPak®** series of inks exceed 70 percent bio-renewable materials. "Old" carbon is mainly comprised of synthetic organic pigments.

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

It is important to note that an ink could be biodegradable, but for the converted packaging to be considered biodegradable, the printed substrate must be biodegradable. Inks that use a very high percentage of bio-renewable materials and are printed on such a substrate could also be considered compostable, with the appropriate testing.



Certifications confirming suitability for composting are available, including the TÜV AUSTRIA Group's OK Compost labels and OK Compost Home certificates, which Sun Chemical has secured for several ink ranges intended for paper

packaging and corrugated boxes (**SunVisto®**, **AquaPak** inks, **Hydrosak** or **Aquaking**), and on bio-based films for the packaging and bags markets (**SunSpectro®**, **AquaThene**, **SunUno™ Solimax AP** or **Soliprop VAT**).

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

Additionally, inks should not affect the growth of different species of trees in a soil containing the ink as part of its composition. This is important to ensure that even if the printed products are mixed with the soil, they will not affect plant growth.

Figure 2 Sun Chemical's data-driven approach to sustainability includes seven key improvement targets for its processes.

Proper Communication of Environmental Claims

For its part, Sun Chemical strives to avoid greenwashing in its communications by implementing guidelines for self-declared environmental claims (i.e., all environmental claims that are not certified or validated by third parties).

These guidelines are aligned with the international standard on self-declared environmental claims ISO 14021, and are used by Sun Chemical employees in preparation of customer-facing documents (presentations, reports, data sheets, etc.) or marketing communications.

An environmental or green claim is the communication of the environmental attributes of a product, service, or organization. These claims can come in a variety of forms.

Some examples could include statements about environmental sustainability, corporate marketing campaigns and declarations about recyclability, energy and water efficiency, or labels on products. A claim may also include imagery such as landscapes and wildlife, or specially developed symbols, pictures, or labels.

Sun Chemical's Sustainability Policy

Sun Chemical's sustainability policy stresses its responsibility to raise awareness about environmental issues in the graphic arts industry. Product stewardship and risk management are also important components of the policy, along with a commitment to take an analytical-based approach.

Providing customers with enhanced sustainability of their processes and end products is the ultimate goal of Sun Chemical's sustainability policy. To reach that goal, Sun Chemical uses rigorous development processes and analytical tools to evaluate and improve the eco-efficiency of both its manufacturing procedures and products.

This data-driven approach means Sun Chemical will be able to set improvement targets for its processes on energy and water consumption, greenhouse gas emissions, and solid waste emissions, as well as develop products with a structured approach that includes risk management and eco-efficiency improvements as criteria.



Focusing on “Getting More—Using Less—Eco-efficiency,” Sun Chemical’s sustainability policy underscores its proactive role in minimizing the life cycle footprint of its products and its customers’ impact on the environment.

There are several facets that encompass sustainability at Sun Chemical. These can include:

1. the development of eco-friendly products;
2. the creation of products designed to improve the eco-efficiency of processes;
3. the formulation of products that comply with regulations and protect consumers; and
4. responsible manufacturing and good manufacturing practices.

The Development of Eco-friendly Products

In order to comply with all the various industry sustainability demands and avoid misleading environmental claims, package printers should engage with ink manufacturers that strive to work with suppliers that can provide raw materials that will ensure a “greener” ink.

For its part, Sun Chemical has responded to the industry challenges by recently rolling out a line of patent pending inks that meet eco-friendly, bio-renewable, and/or biodegradable standards that the industry, retailers, and consumers are looking for.

SunSpectro® SolvaGreen flexographic and gravure solvent-based inks, for example, feature naturally derived resins and additives and are meant for surface printing on biodegradable films. The new inks conform to the North American standard, ASTM-D: 6954-04, and the European standards for compostability, EN 13432, 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.

Sun Chemical’s new products also include **SunVisto® AquaGreen** water-based inks. Formulated with high levels of bio-renewable sourced resins, the inks also deliver the required critical performance attributes needed across a range of paper packaging applications.

These inks are formulated with significantly higher levels of bio-renewable resin content compared to other previous market offerings from Sun Chemical. The inks can be blendable with standard water-based pigment dispersions and do not compromise end-use or on-press performance. They also offer outstanding print fidelity and ink resolubility on press, quick setting for in-line converting, and high levels of resistance to rubbing, abrasion, water, and grease.



Organizations like NAPIM already rate water-based inks highly because water is renewable, but by moving beyond just water with higher levels of bio-renewable resin content, these inks truly do meet the smell test of environmental claims of a “greener ink.”

Finally, Sun Chemical’s product offering for oil-based sheetfed, **SunPak Diamond**, contains high levels of BRC—typically 70 to 80 percent, as confirmed in **NAPIM’s BRC program**.

Products Designed to Improve the Eco-efficiency of Processes

On a macro scale, printers need to deliver packaging to their brand-owner customers that meets retailer green scorecard demands, including lower-weight packaging to reduce gas usage in trucks, extended shelf life and waste reduction, improved recycling streams, the ability to meet compostability standards, and more.

On a micro scale, printers also need to do their part to show environmental stewardship by reducing VOCs and waste, streamlining processes, and reducing inventory.

Sun Chemical manufactures products designed to both improve eco-efficiency in the pressroom and deliver value that benefits the brand owner and, ultimately, the consumer.

One Ink for Multiple Printing Platforms

Many converters use a variety of ink systems for the different printing presses in their shop. Having a single ink that can be used on multiple platforms would not only help printers improve their environmental positioning but allow them to maximize pressroom efficiency and productivity, which ultimately improves the bottom line.

Suitable for both flexographic and rotogravure print processes, Sun Chemical's **SunUno™ Solimax** ink system provides a single platform that can cover multiple end-use applications. The ink system provides shelf standout and high-quality packaging for today's competitive industry and is intended for surface printing and lamination for various end-use applications, such as lidding materials, medical laminates, and food packaging for confectionery and snack food.

Extending Shelf Life and Lightweighting Packaging

Shelf life and the lightweighting of packaging are commercially business-critical activities for brand owners in today's marketplace. Under the increasing scrutiny of regulators worldwide, packaging must protect products, maintain product freshness, and even extend shelf life, whether in transit, in store, or at home. This applies as much to products with a long life as to fresh produce, which needs packaging that will preserve color, fragrance, texture, and appeal while keeping it safe to consume.

This has led to the trend of utilizing flexible packaging formats such as pouches. But in order to create packaging in a way that enhances shelf life, they must be carefully structured—in some cases using a considerable number of layers.

The packaging market's need for products that deliver enhanced shelf life, as well as sustainable, compostable, metal-free solutions, can be addressed through a revolutionary approach that replaces current barrier technology with Sun Chemical's **SunBar® (Aerobloc)** printable oxygen-barrier coatings.



Improvement of Recycling Streams

Consumers and brand owners alike expect PET bottles to be recycled, but far too many end up in landfills because the label wouldn't come off. Upon learning of these concerns, Sun Chemical initiated a major project to solve this industry-wide challenge.

The result was the launch of Sun Chemical's **SunLam™ De-seaming Technology**, a deseamable adhesive that helps recyclers improve recycled polyethylene terephthalate (rPET) yield without process changes or investments in new equipment.

Acknowledged as a "Responsible Innovation" by the Association of Plastic Recyclers (APR), Sun Chemical's SunLam De-seaming Technology enables the removal of the shrink sleeve label from the container during the whole bottle wash step, prior to sorting, in the wet recycling process.

Reducing Volatile Organic Compounds

Printers are regularly looking for ways to integrate sustainable practices into their workflow. One solution from Sun Chemical in North America includes its **SunGraphics® SunLite In-Position Plates**. Shown to reduce a printer's carbon footprint, these alternatives to conventional mounted plates are produced using up to 50 percent less photopolymer—eliminating solvents, VOCs and PVC materials and reducing shipping costs.

SunGraphics SunLite In-Position plates are certified as an environmentally friendly solution for packaging by Walmart's packaging scorecard, which utilizes seven "R's" to determine if a product is eco-friendly—remove, reduce, reuse, renew(able), recycle(able), revenue, and read.

Other Sun Chemical Solutions that Improve Eco-efficiency Processes

- **SunVisto® Anilox Renew** and the **SunVisto Power Scrub** are highly concentrated cleaners designed to provide a deep-cleaning foam that brings heavily soiled plates and anilox rollers back to like-new condition. It minimizes the need for sending anilox rollers out for cleaning and is environmentally friendly, as volatile organic compounds (VOCs) are less than five percent using Method 24.
- The **Sun Chemical Dispenser Program** (North America) was developed to help printers mix only the inks they need, reduce their inventory and waste, improve color-matching consistency, and significantly decrease total operating costs.

Products that Comply with Regulations to Protect Consumers

Brand owners and their supply chain partners have the responsibility to ensure safe packaging and compliance with all regulations worldwide. Focus on food safety is now at an all-time high, and brand owners need to scrutinize their supply chain from all angles to minimize risk.

This applies to packaging as much as to product sourcing and preparation. Where food or sensitive cosmetic products are concerned, it is vital that brand owners work hand in hand with their partner converters to ensure that the inks being used are suitable for the contents and pose no risk to consumers.

The term “migration-compliant packaging” is commonly used to designate materials used in the packaging structure that don't contain components that move from the packaging into the product. The levels of compounds that do migrate should be below the amount that has an effect on the properties of the packaged product.

Sun Chemical pays close attention to regulations worldwide and works to ensure that its customers comply with the strictest of standards. It also takes a leadership role in helping converters achieve regulatory compliance.

For example, Sun Chemical recognized that the issue of migration compliance and food safety would grow in importance and, with foresight, launched its InterTech™ Technology Award–winning **SunPak** family of migration-compliant offset inks and solutions well ahead of the recent food and pharma packaging concerns in North America.

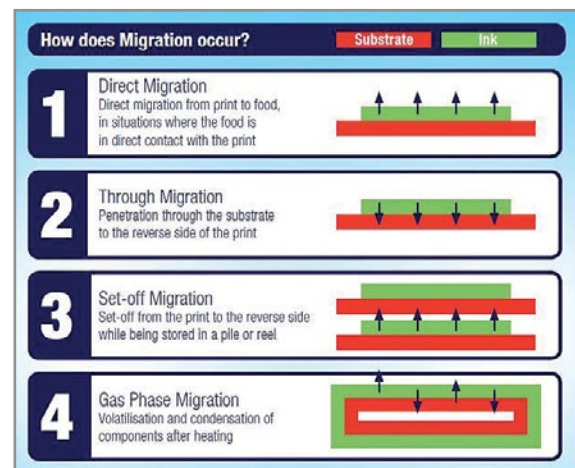
SunPak low-migration inks and coatings offer a comprehensive solution to brand owners and converters who are required to address chemical migration concerns in food, pharmaceutical, personal care, and tobacco applications by exhibiting very low migration of chemicals that could affect the odor, flavor, taste, irritation risk, and safety of those sensitive consumer products.

The Sun Chemical solution combines chemistry, press preparation procedures, lithographic guidance, and analytical support to help converters meet the most demanding requirements.

This trend has continued with the recent launch of three new UV/EB inks for primary and secondary food packaging that are compliant with the strictest global standards in the marketplace, including Nestlé food packaging requirements and Swiss Ordinance chemical composition requirements.

The three inks—**SunBeam® Advance EB** offset inks, **SunCure® Advance UV** inks, and **SunCure® Accuflex UV** inks—meet the latest photoinitiator-safe packaging guidelines, are made with no Bisphenol A (BPA)-based materials to meet the most stringent global standards, and provide low odor as well as very low residual extractables characteristics while maintaining the highest standards of pressroom performance at the very highest press speeds.

Specifically formulated to help increase productivity by significantly reducing the number of blanket washes, these ink systems work on a variety of substrates and specifically address concerns that brand owners face due to strict labeling laws such as California's Proposition 65.



Responsible Manufacturing

Sun Chemical has a sustainability policy in place which states that it is the company's responsibility to be involved in the communities where its facilities are located and to use manufacturing processes that demonstrate environmental excellence through reduced waste generation, lower energy and water usage, and strong safety performance as measured by several key metrics—greenhouse gas emissions, energy and water consumption, carbon footprint, and safety record.

By measuring these key metrics, Sun Chemical has the ability to improve its customers' eco-efficiency and, in turn, enhance the sustainability of their processes and end products. To learn more about what Sun Chemical is doing to achieve its sustainability initiatives with its manufacturing processes and to request a copy of the company's most recent sustainability report, visit www.sunchemical.com/sustainability.

Customers can also calculate the initial carbon footprint for their facility operations by visiting www.sunchemical.com/services/consultative-services.

Conclusion

One of the techniques being used by many printers and their customers to help understand environmental impact is a life cycle assessment. These analyses address the potential environmental impact of a product's life cycle from raw material acquisition and production to customer use, and sometimes can include final disposal.

These assessments help Sun Chemical to provide meaningful data to printers that they can report in their effort to be eco-friendly. Some of this data could help quantify the greenhouse gases associated with

the manufacturing and distribution phases of the ink's life cycle 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.

Sun Chemical can be a valuable partner that can develop both eco-friendly products and other solutions designed to improve the eco-efficiency of printing processes and/or the sustainability practices of retailers and brand owners. It can also create solutions designed to comply with regulations and protect consumers. Utilizing the data that Sun Chemical can provide from its manufacturing practices can also go a long way toward helping achieve pressroom eco-efficiency goals.

To learn more about specific eco-friendly products from Sun Chemical, visit www.sunchemical.com/natural or call 708-236-3798



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