AMGRAPH

Quality. Service. Sustainability.
Packaging for the Next Generation.

A Practical Approach to Sustainability for Flexible Packaging Buyers

A White Paper

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Executive Summary

The packaging industry – indeed industry in general – has been abuzz with the issue of sustainability for the last few years. Whether for personal, environmental, economic, or political reasons, "sustainability" is – or should be – on everyone's radar. As consumers continue to make more informed choices about packaging lifecycles, suppliers like AMGRAPH and our customers should expect to be held to the highest standards.

Today, "sustainable" is a foggy term – defined differently by different authorities, and causing a great deal of confusion for those manufacturers attempting to conform to ever-changing requirements and ideals. Since AMGRAPH's inception in 1984, we've built a solid reputation for environmental stewardship – backed by ongoing capital investment in our plants, operations, and processes – and we've documented our requirements for the material suppliers we do business with. Consulting with leading retailers and sustainability authorities, we have developed a set of expectations for sustainability as it pertains to our customers in the flexible packaging industry.

Our goal is to help our customers understand current and future expectations of sustainability requirements – and to meet those requirements in a practical, high-quality, and cost-effective manner.

What is Sustainable Packaging?

The primary reason it is so difficult to pin down a solid definition of "sustainable packaging" is the speed with which technology is evolving. As we continue to improve the ways we source, manufacture, deliver and reuse materials, we will, presumably, continue to improve our expectations for sustainability. Nevertheless, we believe the best definition of, and vision for, sustainable packaging, has been laid out by the Sustainable Packaging Coalition[1], a project of GreenBlue[2], in its *Definition of Sustainable Packaging Version 1.0*[3]. This vision includes eight guidelines for the development of sustainable packaging; specifically:

Sustainable Packaging:

a. Is beneficial, safe & healthy for individuals and communities throughout its life cycle;
b. Meets market criteria for performance and cost;
c. Is sourced, manufactured, transported, and recycled using renewable energy;
d. Maximizes the use of renewable or recycled source materials;

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[1] The Sustainable Packaging Coalition (SPC) (www.sustainablepackaging.org) is an industry working group dedicated to a more robust environmental vision for packaging. AMGRAPH is a member of the SPC.

[2] GreenBlue is a nonprofit [501 (3)(c)] institute that stimulates the creative redesign of industry by focusing the expertise of professional communities to create practical solutions, resources, and opportunities for implementing sustainability. www.greenblue.org

[3] Definition of Sustainable Packaging Version 1.0, Sustainable Packaging Coalition, October 2005. http://www.sustainablepackaging.org/pdf/Definition%20of%20Sustainable%20Packaging%2010-15-05%20final.pdf

e. Is manufactured using clean production technologies and best practices;
f. Is made from materials healthy in all probable end-of-life scenarios;
g. Is physically designed to optimize materials and energy;
h. Is effectively recovered and utilized in biological and/or industrial cradle to cradle cycles.[4]

AMGRAPH believes the SPC's vision outlines realistic and practical guidelines for manufacturers to consider in the design, sourcing, production, transport, and recycling of packaging materials.

"Cradle-to-cradle" is a term that frequently appears in the discussion of sustainability – and one that has begun to phase-out the more familiar "cradle-to-grave." The emergence of this term gives a nod to the fact that we can't continue to consider the world's landfills the "final resting place" of the products we manufacture. Rather, the "cradle-to-cradle" mentality acknowledges that we need to consider the entire lifecycle of our product – through to and including the use of renewable resources in their manufacture, as well as biological recovery, energy recovery, mechanical recycling, chemical recycling, composting, and landfill in their disposal. Most important, the cradle-to-cradle concept incorporates the concept of recovering materials at their highest value, whenever feasible (i.e., recovering raw and waste materials when they can be recovered or reused in the best possible way, with the least possible waste). The concept of recycling and disposal may begin to become an important cost consideration for our customers as nations, states, and municipalities begin to levy taxes and fees upon manufacturers who produce products and or packages that are not in compliance with their disposal standards.

Flexible Packaging and Sustainability

Flexible packaging affords manufacturers a relative "leg up" on meeting sustainability requirements. According to the Flexible Packaging Association, "innovation and technology have enabled flexible packaging manufacturers to use fewer natural resources in the creation of their packaging, and improvements in production processes have reduced water and energy consumption, greenhouse gas emissions, and volatile organic compounds. Even more, lighter-weight flexible packaging results in less transportation-related energy and fossil fuel consumption and environmental pollution."[5]

Flexible packages, by their very nature, have already made great strides in reducing both raw-material consumption and landfill impact, when compared against traditional packaging methods. And, as the flexible packaging industry continues to incorporate new technologies in design and manufacture, the difference will become ever more substantial.
[Note: Sustainable Packaging: A Flexible Packaging Association Report is a 168-page document published in 2007, focusing on sustainability, including details on the Wal-Mart scorecard and how packaged goods companies can maximize and/or improve on

[4] Ibid.
[5] Flexible Packaging Association. *Flexible Packaging: More Value. Less Waste.* http://www.flexpack.org/sutainable_packaging/FPA_sustainability_brochure.pdf

their score, as well as definitions, surveys, and trends. The report is available through the FPA website, free to members or for a fee of $3,500 to non-members.]

AMGRAPH's Commitment to Sustainability

So what does this mean to AMGRAPH and our customers? As a company, AMGRAPH is committed to continuous improvement in all facets of our business. We are a leading supplier of high-quality flexible packaging using lithographic, flexographic and rotogravure printing. AMGRAPH believes in the "cradle-to-cradle" design concept and is dedicated to creating a more robust environmental vision for packaging.

As a manufacturer of highly engineered products, AMGRAPH understands that the Earth's resources are a priceless asset to be managed for the betterment of our customers, employees, and the global community. We are dedicated to meeting the world's needs today, without compromising the Earth's ability to meet the needs of tomorrow.

Our Plant and Processes

AMGRAPH specifically designs, builds and maintains our facilities to ensure maximum operational safety. We are excited about the 2009 Grand Opening of our "Green Plant" expansion, providing us with 50% additional operating space. Our Green Plant includes the following green initiatives:

a. Insulated Concrete Form (ICF) wall system construction – designed to be strong, durable and extremely energy efficient, as well as clean, quiet and comfortable. Also, the **energy required to heat and cool the new plant will be reduced 71%** versus conventional wall construction methods.
b. We incorporated Leadership in Energy and Environmental Design (LEED) certification in our decision-making process. **The LEED green building rating system provides third-party verification that our building is environmentally responsible, profitable, and a healthy place to work.** LEED is the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings
c. The expansion's heating needs are **powered by a geothermal system**. It also incorporates **radiant floor heating**, which is the most efficient method of heating, and provides the greatest level of comfort to our employees.
d. The building's ventilation system utilizes a **heat exchanger** to further reduce our requirements for heating and cooling.
e. The expansion also features **natural lighting**, using EnergyStar-rated windows.

Likewise, we have implemented processes and procedures to maximize environmental impact:

a. **We replace motors and drives for better efficiency** with those that are EnergyStar-rated, wherever possible.
b. We set up **regional warehouses** to avoid costly LTL shipments to our customers who are located far from our manufacturing facility. Our regional warehousing system not only enables us to serve our customers

more quickly and efficiently, but also reduces gasoline usage and truck emissions.

c. **We feed 70% of our clean waste to an energy producing facility.**
d. We **recycle another 26.5%** of our clean waste.
e. Our purchase strategy for **new equipment requires environmentally waste-efficient systems**.
f. Our most recent printing press purchase was designed to **minimize waste and significantly reduce energy consumption**. It is manufactured to the highest safety standards using the latest technology. The press drying system incorporates a two-part heat exchanger. The primary heat exchanger captures exhaust heat to pre-heat intake air for the dryers. This **reduces the energy required to heat the intake air by 33%,** or approximately 1 million BTUs. The secondary heat exchanger **captures energy to provide 100% of the heating requirements for our 7,200 square foot press enclosure**, during colder months.
g. Our new cooling water system for our printing press and adhesive lamination line incorporates a **hybrid chiller/fluid cooler system**. The chiller uses high-efficiency compressors, married to a fluid cooler through a plate heat exchanger and a sophisticated control system that automatically **maximizes the use of the fluid cooler and provides 100% of our chilling requirements during colder months** (Nov.-Mar.). This new system will also provide 100% of the cooling requirements for our 7,200 square foot press enclosure.
h. We **encourage source reduction** wherever possible, without compromising product integrity.
i. We are proud of our **zero waste water to ground discharge** program. We have had this program in place for over 10 years.
j. We **consider even the smallest energy savings**. For example, our new slitting lines automatically hibernate their hydraulic and trim collection systems when the machines idle. And, we've installed automatic shut-offs for all office lights and automatic "hibernation" for our computers, when not in use.

Our Plans

In addition to the improvements outlined above, AMGRAPH is currently planning the following initiatives:

a. AMGRAPH's goal is to use **wind turbine, solar, and geothermal energy** generation wherever possible.
b. We are researching installing a **nitrogen self-generation process** which will save energy by **eliminating truck transportation and allow for off-peak time production**.

Sustainability from the Inside Out

But it's not all about what we do inside the plant. We understand the decisions we make regarding our suppliers directly affect our customers, and the environment. In an effort to assist our customers with meeting the most stringent sustainability requirements, at AMGRAPH we hold our suppliers to the highest standards.

Our Primary Ink Supplier:

a. Has produced **Electron Beam (EB) inks** exclusively for AMGRAPH and our customers. These inks generate **nearly zero Volatile Organic Compounds (VOCs) and are non-toxic**.
b. Supplies us with inks containing **no ozone-depleting chemicals**, and exceeds heavy metal limit regulations.
c. Has **actively reduced waste** and supplies non-hazardous materials to an **energy recovery** facility.

Our Largest Foil Supplier:

a. Has **replaced dangerous exo-gas generators with off-site waste nitrogen gas** in their process.
b. Has instituted a special process to convert **50% to 90% of the ozone** in its incoming air to clean oxygen.
c. Has **collected oily waste water** from marine vessels' bilges. This waste water is efficiently burned off in furnaces, producing waste water that is safe for the environment after it is cooled in towers – replacing the use of drinking water. Landfill vegetable oil is used the same way.
d. Has used an innovative rolling lubricant which resulted in a **90% reduction in emissions** – setting a state record and example for other manufacturers.

Our Primary Paper Partner:

a. Offers **100% raw-material traceability**, and a **55% all-fiber certification** system.
b. Derives **42% or more of their in-process energy from bio-fuels.**
c. **Reduced CO_2 emissions** from fossil fuels by 14%, and total Greenhouse Gas (GHG) emissions by 11% as part of the Chicago Climate Exchange.
d. Realized more than a **26% reduction in hazardous waste**
e. **Supports sustainable forestry** by manufacturing papers in mills that have been certified by leading industry organizations.
f. **Sources only legally harvested fiber** from suppliers, based on the FSC Controlled Wood standards.
g. Has developed papers that carry **single-, dual- and tri-certified chain-of-custody**, as well as paper manufactured with **up to 30% post-consumer recycled fiber**.
h. Has recently achieved Green **Globes verification** for its corporate headquarters from the Green Building Initiative's (GBI) environmental assessment and rating system for commercial structures – recognizing minimization of harmful air emissions, energy and water conservations, integration of recycled materials and project management practices.

Our Main Resin Source:

a. Has developed resins which can be **down-gauged or have improved** processing efficiencies. Down-gauging reduces the amount of material required for a given package, and improved processability reduces the amount of energy required to convert the resin into a finished good. Both features result in substantial energy savings.

b. Has focused its efforts on **minimizing energy use, greenhouse gas and VOC emissions, and the disposal of solid and hazardous waste and water consumption**.

Our Largest Film Supplier:

a. Supports a marketing strategy to **replace foil with film** in packaging, yielding an overall source reduction.
b. Has changed their product mix to **eliminate polyvinylidene chloride (PVDC)-coated films**, which have been found to be environmentally unfriendly.
c. Has begun to **develop polylactide (PLA) films, made from renewable resources such as corn**.
d. Has started to develop degradable films using new-technology additives.

Understanding the "Scorecard"

While many manufacturers are voluntarily moving toward sustainability as part of an underlying corporate culture of environmental stewardship, still others are moving in that direction because of increasing requirements that are being handed down by retail giants, led by Wal-Mart and its Sustainable Packaging Value Network. Yet, like the term "sustainability" itself, the requirements have yet to be well defined. Wal-Mart, and other retailers like them, have a huge task in front of them because of the number of stores they operate, combined with myriad products they carry. Their sustainability requirements cover not only the products sold in their stores, but the overall operation of the physical plants themselves, warehousing, and trucking. But because they are so large, the work they are doing – even to reduce a small amount of waste – can have a very large impact. As suppliers, we can begin to anticipate what the requirements will be, based on the changes that have already been made.

Wal-Mart's first goal related to packaging was achieved in May 2008 – selling only concentrated liquid laundry detergent in US and Canadian stores. Put in perspective, because Wal-Mart sells ¼ of all liquid laundry detergent in the US and Canada, the reduction in plastic resin packaging and water usage resulting from Wal-Mart's achieving this goal is substantial. Wal-Mart has made a pledge to look at every retail category with the same critical eye. According to Wal-Mart's website, "We know we have a powerful role to play in helping people live better through access to affordable, sustainable products. At the center of our efforts is the conviction that people shouldn't have to choose between products that save them money and products that have minimal impact on our environment."[6]

To meet this lofty goal, Wal-Mart established global packaging benchmarks, including:

- Creating a closed loop on packaging in which Wal-Mart ultimately becomes a raw material supplier to packaging manufacturers;
- Reducing packaging 5 percent by 2013;

[6] Wal-Mart Sustainable Progress to Date 2007-2008.
http://walmartfacts.com/reports/2006/sustainability/environmentSustainable.html

- Becoming packaging neutral by 2025; and
- Replacing PVC (polyvinyl chloride) in Private Brand packaging.

Wal-Mart also is closely examining alternative packaging using renewable resources like corn and potatoes, to reduce or replace polystyrene, increase recycled content, and replace "clamshells" made of non-recoverable materials.

Wal-Mart's Packaging Scorecard was officially announced in 2006 to Wal-Mart's private label suppliers and rolled out globally earlier this year to all of its suppliers. It evaluates suppliers on packaging sustainability, and ranks them relative to other suppliers. Wal-mart's buyers are already using results of the scorecard to make purchasing decisions.

One interesting fact directly from Wal-Mart's website: Wal-Mart works with 60,000 suppliers worldwide. In February of 2008, when the scorecard was unveiled, 2,000 suppliers logged on to Wal-Mart's website, and 100 products were scored.[7] While Wal-Mart proudly touts that number, 2,000 suppliers equates to only 3% of Wal-Mart's total suppliers. Many suppliers are understandably resistant to adhering to external guidelines and being "scored" –yet, a good score could represent huge economic opportunity.

Capitalizing on the Opportunity

At AMGRAPH, our goal is not only to assist our customers in attaining their sustainability goals and initiatives, but also to capitalize on the substantial opportunities presented by retailers placing high demand on products that meet sustainability requirements. By developing cost-effective, sustainable packaging, we are able to maintain a satisfied customer base, our customers meet growth targets, retailers meet sustainability goals and, most important of all…our Earth is safe and healthy for our future generations.

Contact AMGRAPH

We are happy to assist you in implementing your sustainability initiatives. Contact us at 1-800-243-0294, or visit us at www.amgraph.com.

[7] Wal-Mart Sustainable Progress to Date, Supply Chain Packaging. http://walmartfacts.com/reports/2006/sustainability/environmentSupplyPackaging.html