



## Institute Of Packaging Professionals AmeriStar Package Competition Expanded Narrative

### Ecologic Brands Inc. – Molded Fiber Bottle

#### I. Innovation

##### a. Creative Application

Ecologic Brands designs and manufactures sustainable packaging solutions that minimize the use of plastic while maintaining the functionality and convenience consumers have come to expect. Ecologic's bottle consists of a molded fiber outer shell made from 100 percent recycled cardboard boxes (OCC) and old newspapers (ONP), integrated with a thin plastic inner pouch. The bottle accommodates a range of film substrates and fitments suitable for various categories, including food & beverages, household cleaning products, health & beauty, nutraceuticals, private label goods, chemicals, etc.

Seventh Generation, the largest green cleaning brand in America, is the first brand to commercialize the ecologic packaging system. Seventh Generation launched a 4X concentrated laundry detergent in the ecologic bottle in March 2011, which has lifted their liquid laundry sales by 15.3% (SPINS 40-week ending 12/24/11). The product is now sold in over 7,000 retail stores across the U.S. and we are about to produce our millionth bottle.

Ecologic has a significant pipeline of new stock eco.bottles in the works.

<http://youtu.be/nxD7XdRE-QQ>





## b. Technical Advances

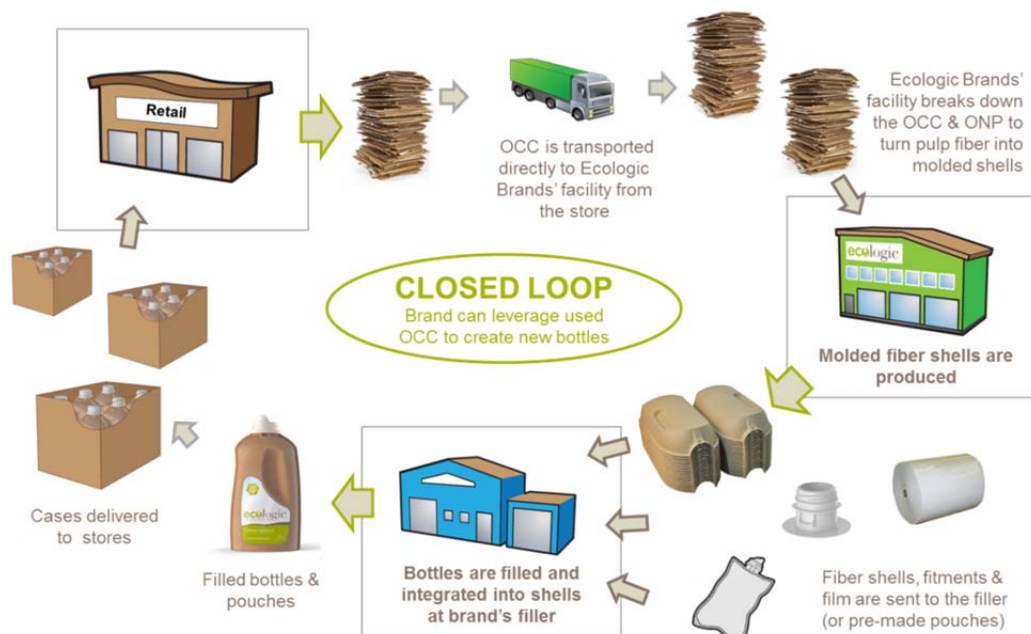
Bottles made by Ecologic Brands are developed to function just like traditional plastic bottles with comparable strength and rigidity, but with much less plastic.

The outer shell is made from 100 percent recycled cardboard and old newspaper, and can be recycled up to seven more times or composted where no recycling facilities exist. These shells are stronger than traditional molded pulp due to the unique processing with heat and pressure that creates a stronger part than traditional pulp used for products like egg cartons. Top load, torque application and moisture resistance all benefit from this stronger pulp molding process.

The inner pouch and spout is made from #4 LDPE and uses up to 70 percent less plastic than comparable HDPE plastic jugs, is recyclable with plastic shopping bags at retailer drop-off bins, and is BPA free. The unique package is patent pending (utility patent), as is the equipment utilized to assemble the bottles.

## c. Design Advances

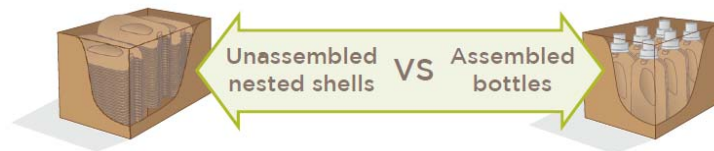
Ecologic Brands carefully designed the ecologic package to provide all the functionality of a rigid plastic bottle. The outer shells offer a solid, comfortable grip, an excellent pour and a flat, stable bottom. The dosing cap is a stock closure commonly used for plastic laundry bottles. A moisture-resistant shell means no sticky drips and the bottle's different look and feel clearly communicates a more sustainable choice. There are currently three SKUs available in the eco.bottle™ stock product line, and the bottle's outer shell can be made from recycled cardboard, bagasse, agrofibers or other materials. The bottle shape and label area can be customized to fit different brands' needs and help them stand out on store shelves. The idea of upcycling recycled material and waste into a bottle is a novel and sustainable concept.





#### d. New Material Applications

This is America's first molded fiber bottle, and applies level 3 thermoform fiber molding technology in novel ways that will disrupt store shelves. The heat and pressure used to mold this bottle provides rigidity and strength while allowing for elegant custom designs. This is perhaps the first time a fully recyclable all-polyethylene pouch has been used to package retail products such as household detergents and cleaners. The Ecologic Assembly Unit ("eco.system") that integrates the inner pouch into the outer shell is a patent-pending technology that will provide significant shipping efficiencies for brands and co-packers who adopt the bottle and assembly system. Because the pre-assembled shells nest inside one another during shipping, and the pouches take up less room on a truck, you can fit up to 6.1X more unassembled ecologic bottles onto a truck than empty rigid plastic bottles.



#### e. Transfer of one technology from another use or industry

Ecologic Brands took the application of molded fiber technology to another level—Innovating what people typically view as material used for egg cartons, paper plates, bowls, and trays and turning that into a durable, highly-functional premium packaging solution that provides a unique point of difference on-shelf.

## 2. Protection

#### a. Protection and biological, chemical and distribution requirements

While the rigid outer shell provides support, the inner pouch is offered in a range of substrates compatible with food & beverages and chemicals:

- #4 LDPE films, PE/Nylon films for hot fill up to 220°F, specialty films for chemicals, high oxygen & moisture barrier films

#### b. Testing methods for protection

- **Equipment selection** – Different types of fiber-making equipment were tested across the globe before finding the machine that could best control the quality, strength and consistency of the product
- **Drop tests** – Filled bottles successfully dropped from 12, 24, and 36 inches without bursting or leakage
- **ISTA certified** – Ensures safe long-distance shipping of finished goods
- **Compatibility studies** – Pouch films have been tested for food beverages and chemicals applications
- **Top load** – Each bottle able to withstand 30 lbs or more of stacking/top load pressure (for packing/shipping)
- **Cap torque** – Easily meets capping equipment requirements



- **IMS Disintegration** – pulp shells were tested and passed micro tests
- **Compostability** – pulp shells passed ASTM 6868 and contain 100% organic bio-based material, as certified by Soil Control Labs

c. *Do testing methods address protection needs?*

Yes, the bottle quality remains unchanged from shipping to integration, and retail distribution to in-home use. The entire loop has been tested over the last 2 years. Extensive shelf life testing and distribution simulation testing were performed to ensure excellent product protection and integrity.

d. *Has package met testing requirements?*

Yes, all current Ecologic bottles meet standard testing requirements (IMS, ISTA, packaging line trials, etc.). And each packaging solution under development undergoes stringent, individual testing to ensure that the highest quality is achieved. Ecologic strives to provide packaging that performs as well as traditional plastic bottles.

### 3. *Economics*

a. *Cost reduction factors*

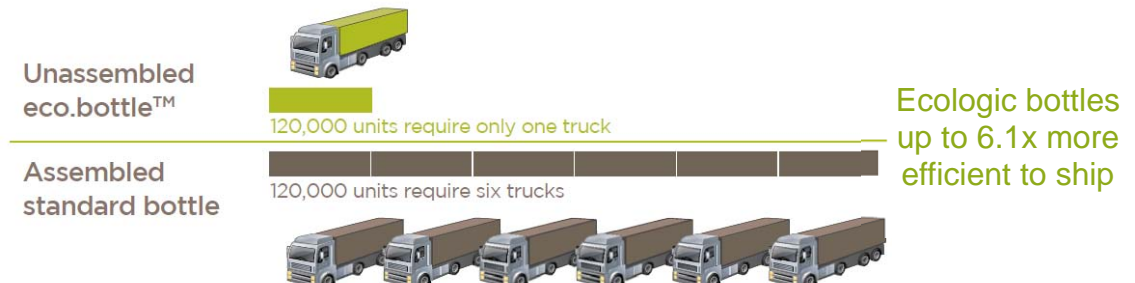
For every 1 truck used to ship an unassembled ecologic bottle to a filling location, an equivalent of 6-7 trucks are needed to ship traditional empty plastic bottles. This is a huge saving in term of shipping cost (approx. 77%). Storage and warehousing is also up to 7 times more efficient than storing empty plastic bottles.

From an environmental perspective, adopters of the Ecologic solution produce less carbon footprint before AND after consumption through less plastic and more recyclable material. Additionally, one gallon of water is used to recycle every 76 fiber bottles, compared to one gallon of water every 37 plastic bottles.

Ecologic bottles are currently premium priced; however, Ecologic plans to self-manufacture the bottles in Q1 2013, which will drive down COGS and bring us to parity or a slight premium to plastic bottles.

b. *How were costs reduced?*

Ecologic's molded fiber outer shells, in unassembled form, can be stacked for integration at customers' sites so that ~120,000 units fit into a single 53' freight hauling truck load, whereas 6-7 trucks are required to fit the same number of empty plastic bottles. Customers save on truck loads, gas, shipping materials and storage.





### c. Life cycle issues

A full LCA is in progress. As shown in the Closed Loop image on page 2, the ecologic bottle is the first bottle to provide a truly closed loop system:

- Ecologic's raw material inputs come from recycled waste
- Ecologic converts or upcycles this waste into bottles, bypassing paper mills
- The shells are shipped efficiently nested, removing trucks from the road and carbon from the environment
- After use, the bottles can be recycled again, or reduce landfill waste

## 4. Performance

### a. How does package fill, open, re-close, store?

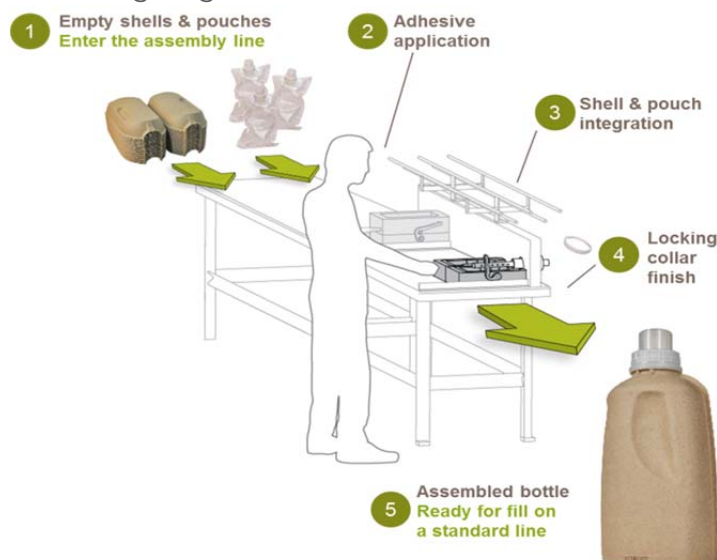
The assembled empty bottles are filled on standard in-line or rotary commercially-available fillers, and accommodate stock labels and closures. Using Seventh Generation 4X laundry detergent as an example, the Berry dosing cap opens and re-closes conventionally using threads, and stores just like a regular HDPE or PET bottle, but with much less plastic.

### b. How does it run on machinery (machinery efficiencies)?

For assembly, each automated integration unit can produce up to 15 million assembled bottles annually. With minimal change parts, each assembled bottle can run efficiently on standard fill lines (see above).

### c. Overall integration (production line, distribution)

Proprietary equipment has been developed to assemble the bottle which can then transfer seamlessly to a traditional filler, capper, labeler, and case packer. The integration process is depicted in the following diagram:





#### d. *New benefits to end users*

Ecologic bottles are an eco-sensitive alternative to plastic jugs and non-recyclable containers. They afford consumers a sustainable choice in the packaging of everyday products and help them better understand that the beauty of a package is not only about the outside appearance but also about the origins of materials.

The molded fiber shell provides a more functional, less slippery grip than rigid plastic containers. It fits well in the hands of all consumers, including females, elderly and small children.

Every empty Ecologic bottle is 100 percent recyclable in three simple steps – users simply pop it open along the side seam, remove the inner pouch from the outer shell, and recycle or compost.

The outer shell can be recycled with paper in curbside and drop-off recycling programs. The inner pouch and spout are #4 LDPE plastic and can be recycled with plastic grocery bags at local retailers' bins. The separate dosing cap is #5 PP plastic which is accepted at some recycling centers and at "Preserve Gimme 5" bins, available at most Whole Foods Markets.

[http://youtu.be/\\_mOctnN\\_qt8](http://youtu.be/_mOctnN_qt8)



### 5. *Marketing*

#### a. *Structure/graphics and how they contribute to image, shelf-impact*

The Ecologic bottle looks and feels different. The outer shell's earth-tone color clearly communicates a more sustainable packaging choice and stands out among a wall of plastic. Consumers intuitively and instantly understand that it is a more sustainable choice. Furthermore, the outer shell can be made with green materials beyond recycled cardboard and newspapers. Ecologic Brands also offers bagasse (leftover sugar cane fiber) or recycled paper for a bright, white-colored finish. Materials are saved and re-molded into a customized packaging solution to align with various brand objectives. The outer shell's size, shape and label area also can be customized to further achieve on-shelf differentiation.





*b. If redesigned, how did it improve the acceptability of the package?*

Ecologic Brands' molded fiber bottle has never been done before. Research and development of the bottle spanned over 3 years, including consumer and in-store tests with milk produced by Straus Family Creamery, a popular organic dairy company based in Northern California. The 6-week test generated an impressive 72% lift for non-fat milk vs. sales data from the year before, and a 21% lift in overall sales for the brand. Based on bottle functionality in the Straus test, the bottle was re-designed with locking features around the neck to prevent spinning of the pouch inside the shell and to strengthen the top-load pressure on the bottle. These changes further enhanced the acceptability of the Seventh Generation bottle.

Ecologic's first bottle launched in conjunction with the natural 4X concentrated laundry detergent produced by Seventh Generation, a leading brand of green cleaning products.

Market reception has been phenomenal. The 4X reversed a decline in Seventh Generation's liquid laundry business, achieving 15.3 percent sales lift through 40 weeks since launch compared to a 5.0 percent decline in 52 weeks leading up to launch. Seventh Generation's 4X detergent in the ecologic bottle has rapidly gained 76 percent distribution since its launch in March 2011, and has garnered nationwide acceptance from retailers including Whole Foods, Target, Kroger, and Raley's.



## 6. Environmental Impact

*a. How does package address environmental considerations?*

- Leverages the recycling stream by using recycled corrugate and old newspapers
- Reduces landfill waste
  - Only 29% of HDPE bottles are recycled in the US
  - 81% of paper is recycled in the US
  - Pouch is recyclable or takes up dramatically less space in a landfill
- Shipping efficiencies
  - Unassembled bottles are approximately 6x more efficient to ship to filling location vs. empty plastic bottles.