



# Sustainable Distribution

■ “We set high environmental standards for the 171,000-square-foot expansion of this building in pursuit of LEED certification,” says Dave Abeloe (pictured), director of Patagonia’s distribution center in Reno. Photo courtesy Patagonia, Inc.

PATAGONIA’S DISTRIBUTION CENTER TAKES A GREEN STEP FORWARD BY INCREASING EFFICIENCY BY 20 PERCENT AND REDUCING POWER CONSUMPTION UP TO 30 PERCENT.

>> BY JIM MCMAHON

**W**hen Patagonia, Inc., set out to expand its Reno, Nev., distribution center recently by 171,000 square feet, the company designed and built the structure to align with its core purpose of using business to inspire and implement solutions for positive environmental impact. Every component of the project appears to have been aligned with this environmentally sensitive mandate.

The building’s steel frame, insulation and window glass contain recycled materials; energy-efficient lighting systems rely on motion sensors to help conserve electricity; in winter, a radiant heating system using copper tubing and hot water saves on natural gas; a bio-filtration system that employs an oil-water separator moves





runoff from the roof and parking lot to percolate back into the ground; its carpet is 100 percent recycled polyester, the restroom countertops are 100 percent recycled plastic, and portions of the office walls are made of compressed field straw that is formaldehyde free; wallboard, paint, floor coverings, and ceiling and shower tiles use recycled content; and all wood used is either reclaimed or sustainably harvested. The expanded distribution center has been designed to reduce its demand on energy, recycle and reuse building materials, and otherwise create an extremely green facility.

This green distribution center initiative holds true with the facility's material handling systems technology as well. Specifically, Patagonia put in place a state-of-the-art, modular, Plug & Convey conveyor system that can handle greater dimensional and weight diversity than conventional systems, and it allows user-selectable carton gapping controls for a broader level of flexibility. The modular conveyors, which were

designed, built and installed by Dematic, also feature a characteristic very critical to Patagonia — a run-on-demand capability, which can reduce power consumption by as much as 30 percent versus conventional roller conveyors. For Patagonia, this conveyor system fits right in with the distribution center's ideal green operating environment.

Originally built in 1996, the distribution center's expansion was undertaken to efficiently and rapidly distribute Patagonia products from one centralized location to its Internet and catalog direct-to-consumer business, and also to streamline service to its retail stores and distributors throughout North America.

#### PATAGONIA: COMMITTED TO THE ENVIRONMENT

Patagonia, Inc., owned by Lost Arrow Corp., headquartered in Ventura, Calif., engages in the design and manufacture of clothing, accessories and luggage items. It offers clothing for climbing, skiing, snowboarding, surfing, fly-fishing, paddling and trail-running sports. It sells its clothes, gear, accessories and luggage through specialty retailers, a catalog, a website and its own stores.

Founded and owned by world-class mountaineer, diehard surfer and obsessive fly fisher Yvon Chouinard, Patagonia grew out of a small company he founded in 1957 that made tools for climbers. In 1972, it branched into clothing, launching a new company called Patagonia. Among its early offerings were rugby shirts, corduroy knickers and boiled-wool mittens. Today, the company sells approximately \$250 million of product annually and has been steadily growing.

Patagonia has since its beginning been staunchly committed to environmental concerns. It became the first California company to use renewable energy sources like wind and solar to power its buildings, and it was one of the first to print catalogs on recycled paper. Chlorine disappeared from Patagonia's wool products, replaced by a patented slow-wash technique. Its cotton products are made only with organically grown cotton, making that switch more than a decade ago. Instead of adding antimicrobial silver — a groundwater pollutant — to its underwear lines, it uses a product made of crushed crab shells for odor control.

The company also donates 1 percent of its gross revenue annually to groups that support green initiatives. To date, it has released more than \$25 million to such environmental groups.

Patagonia looks at designs and concepts that make its facilities more efficient and more productive to reduce the impact on the environment. This means taking a holistic approach to all aspects of its business, from sourcing lower-impact dyes and organic cotton to maintaining its plants and distribution center.

"We work tirelessly to reduce this pollution in our products, processes and facilities," says Dave Abeloe, director of Patagonia's distribution center in Reno. "It is our mission to demonstrate that alternatives to conventional, waste-intensive construction practices and energy generation not only exist, but yield products, structures and, ultimately, lifestyles that are more sustainable and in harmony with our environment.

"When we needed to expand our Patagonia distribution center in Reno, Nevada, we looked to the Leadership in Energy and Environmental Design, or LEED, certification standards as our guide," continues Abeloe. "Green building practices strive to balance environmental responsibility, resource efficiency, occupant comfort and community sensitivity. We set high environmental standards for the 171,000-square-foot expansion of this building in pursuit of LEED certification from the U.S. Green Building Council (USGBC).

"LEED certification required that we install metering equipment to ensure the DC [distribution center] is operating at peak levels," Abeloe explains. "It monitors lighting systems and controls, constant- and vari-





■ The expanded Patagonia distribution center has been designed to reduce its demand on energy and recycle/reuse building materials to create a green facility. Photo courtesy Patagonia, Inc.

able-motor loads, and variable-frequency-drive operations.

“We achieved a Gold rating for this facility,” says Abeloe. “Our efforts to meet this standard will help mitigate the building’s effect on the environment, which is part and parcel of the Patagonia philosophy.”

#### DIRECT-TO-CONSUMER GROWTH SPIKES FUEL EXPANSION NEED

The facility must be able to handle cartons that contain many pieces of apparel, as well as smaller mailing bags that typically contain just one piece of apparel. The order sizes can range from several thousand order lines going to its stores or retail customers, to very small orders delivered directly to catalog or Web customers.

In recent years, Patagonia’s catalog and Web business has grown quite significantly. During peak season, several thousand orders a day move through this channel. The process for handling direct-

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to-consumer orders was manual and unwieldy. As direct-to-consumer shipments increased, more workers were put in place to handle the workflow. Without automation, this led to congestion and delays in order fulfillment. This situation led Patagonia to review systems for automation of the process.

Prior to the upgrade, the company's direct-to-consumer process started at packing stations, where workers handled both cartons and mailing bags. Cartons were packed, moved off the carton table and onto a takeaway conveyor. The cartons would move untouched through scanning, a weigh scale (which weighed and verified the correct weight for the goods that were to be packed in that carton) and then routed directly to the parcel trailer dock or to a less-than-truckload (LTL) line where pallets were built.

In the past, if an order was packed into a mailbag, it was dropped onto a separate conveyor belt that ran past the base of the packing tables. From there, all the direct-to-consumer orders were dumped into a big hopper. Workers would manually take the mailbags out of the hopper, scan them, do the weight check,

put them in a cart and wheel them to the shipping door. During peak season this required 3.5 full-time equivalents (FTEs).

Because the direct-to-customer business would continue to grow, and the problems associated with that process were anticipated to continue to get worse, the company began looking at how this problem might be solved in the fall of 2005.

It became clear that the distribution center needed a downstream conveyor system that could efficiently handle packages with widely divergent weights and sizes. The plan involved having both cartons and mail packages move on the same conveyor through the weigh station. Then, orders would be segregated by a sorter into different shipping containers based on whether the goods were to ship parcel or LTL.

#### ECO-FRIENDLY MODULAR CONVEYORS

Patagonia selected the modular conveyors from Dematic Corp. of Grand Rapids, Mich. ([www.dematic.us](http://www.dematic.us)). This conveyor has made improvements across several dimensions. It can convey goods of widely divergent weights and sizes on the same conveyor. These new

conveyors also have an increased ability to handle difficult-to-transport items like poly bags, which are frequently used for direct-to-consumer orders.

The conveyors can maintain user-selectable gapping between conveyable items. This uniform spacing leads to fewer package jams. Jams, of course, cause product damage, but jams also cause more system downtime than mechanical and electrical failures. In contrast, most roller-accumulation conveyors allow more than one package to fill a zone. This may create problems since the zone will treat several packages as a single package, causing jams and side-by-sides. Using the Dematic solution, without changing hardware, the user can select a desired gap for maximum buffer, for sorting or for proper pitch prior to an in-line scale. The user can also select the speed from 70 feet-per-minute up to 400 feet-per-minute.

These new conveyors are extremely flexible. If process needs change, the modular conveyance units can be unbolted from the floor and moved to fit a new process. In contrast, traditional conveyors, with their exten-

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■ Modular, flexible material handling systems contribute to the overall efficiency of Patagonia's LEED Gold distribution center. Photo courtesy Patagonia, Inc.

sive electrical wiring, air piping (pneumatics are eliminated on the conveyors) and long sections, usually have to be junked.

The conveyor is implemented by very simply snapping the pieces together. Each conveyor section has its own control logic and internal wiring. This means the messy and time consuming electrical cabling labor associated with typical conveyor implementations is no longer necessary.

Intelligent controls give individual sections the ability to speed up or slow down. This was important for Patagonia because the weighing station was the bottleneck for the downstream material handling process. The more uniformly items were spaced before entering the weigh station, the better the whole system worked.

Because the new conveyors have small modular belt sections with intelligent controls, if packages are too widely dispersed —

some packages too close to each other, some too far apart — the conveyor adjusts spacing appropriately. When a package that is too far behind the package in front of it enters a short modular section of conveyor with a photo eye, that conveyor section speeds up the belt to achieve the appropriate spacing. If a package is too close to the one in front, the conveyor slows down. In short, accumulation with superior package control improves the overall system performance.

The conveyor also has the functionality to automatically turn itself off when it is not needed. This is a tremendous capability for energy savings versus conventional systems.

Patagonia has been using the new conveyor system for nine months now. The distribution center has gone from 3.5 FTEs to 0.5 FTE for this part of its process.

## SYSTEM FLEXIBILITY

One of the largest risks associated with purchasing inflexible material handling systems is that order profiles will change (for example, more case or item shipments, fewer pallets) necessitating new processes and new hardware configurations. Modular, flexible systems lower the risks of a system becoming outdated.

“We designed the modular conveyor system from the ground up to provide superior availability, high performance, and lower total cost of ownership,” says Michael Hirsch with Dematic. “Compared to conventional conveyor systems, it reduces power consumption up to 30 percent, reduces labor up to 20 percent and conveys a wider variety of product.

“The Dematic Plug & Convey modules are engineered to reduce maintenance, and designed for fast installation,” Hirsch continues. “Integrated distributed controls provide diagnostics and new levels of user control, with system and unit adjustments to maximize performance and reliability.”

Such a material handling advance helps to solve some of the increased pressures that logistics personnel are facing: increasing numbers of SKUs, the growth of the direct-to-consumer channel because of the Internet, and increasing demand for more frequent but smaller shipments. All of these developments mean companies will increasingly need to convey goods with a greater diversity of dimensions.

Patagonia's Reno distribution center ships more than 7 million items annually. These SKUs are a mixture of various sizes and quantities being shipped to end consumers, retail stores and wholesalers. The distribution center can handle it all with facility. And much to the liking of Patagonia, it runs its distribution center as a very green operation. **SF**

*Jim McMahon writes on logistics automation. His feature stories have appeared in hundreds of industrial and high-tech publications throughout the world, and his stories are read by more than 5 million readers monthly. McMahon can be reached at jim.mcmahon@zebracom.net.*