

CAROUSELS: Turning picking into PRODUCTIVITY

Not just for high-density storage anymore, today's carousels are delivering product to the person while increasing productivity, reducing labor, saving space and cutting energy costs.

By Lorie King Rogers, Associate Editor

Vertical and horizontal carousels have been moving product through warehouses and distribution centers for more than 25 years. In addition to creating dynamic high-density storage, carousels can be credited with increasing productivity, reducing labor, saving space and cutting energy costs.

The concept of carousel technology hasn't changed much over the years. That might be because a carousel is a robust and dependable piece of equipment, and it is mechanically pretty simple, says Jack Lehr, vice president of sales for automated systems for SSI Schaefer (www.ssi-schaefer.us). What is changing is how users are applying carousel technology. "About five years ago, however, engineers in the United States started to recognize that the goods-to-person process is hands down the most efficient picking process," says Lehr.

So, if you have a picking operation, are carousels the right solution? "Any manufacturing plant, warehouse or distribution center currently using a traditional static rack and shelving system should investigate the possibility of incorporating an automated solution like a vertical or horizontal carousel," says Christina Hillgoss, marketing and communications manager for KardexRemstar (www.kardexremstar.com).

And, that investigation should cover a few key areas. Paul Roy, vice president of marketing and product management for

System Logistics (www.systemlogistics.com) recommends asking: Am I currently using labor to pick from shelving? Do I have space and accuracy issues? Do I need to get orders out the door faster?

If you answered “yes,” to any of those questions, it might be time to consider a carousel. “Carousels can go anywhere shelving can go,” explains Hilligoss. “If you’re looking to save space, a vertical carousel might be the solution. If you’re looking to increase productivity, horizontal may be the way to go.”

Either way, the starting point is a return on investment (ROI) estimate. “Carousels have an average ROI of about 18 months,” Hilligoss says. Whether your return is shorter or longer may depend on your current operations. For example, are you renting space off site to store product? How many people will you be able to retrain and relocate?

Common characteristics

Both vertical and horizontal carousels share key components that are vital to an operation’s bottom line:

- They incorporate dense storage technology to house product and components, and carousels can save as much as 85% of the space used to store items in traditional, static shelving and rack systems.

- Carousels bring products to the person performing a picking or putaway activity, and they eliminate the need for associates to walk to retrieve the items needed to fill an order. That can cut labor by up to 65%. As a rule of thumb, one carousel can do the job of five or six people in a conventional process.

- Carousels require precise operator input to confirm, guide and control each function, and the result is zero-error order picking. This avoids the need to re-handle orders and assures high service levels to the customer.

- Carousels are modular and flexible. Like building blocks, the units can be combined, allowing for scalability for a specific project then easily reconfigured when the project requirements change.

- Carousels deliver items to the associate’s “golden zone,” which indicates the ideal ergonomic height. That area reduces the potential for injuries associated with excessive reaching and bending, a significant bonus for workers, although difficult to calculate as part of an ROI analysis.

The benefits of carousels

Vertical and horizontal carousels have different characteristics. Yet, each brings something different to the storage and



High-density storage carousels not only save floor space and optimize vertical space, they bring the product to the person, which increases throughput and improves picking accuracy.

order fulfillment table.

A vertical carousel rotates up and down, or elliptically, bringing the right part to the right worker at the right time, usually delivered in bins, totes or on shelves. These are ideal for lightweight items because anything too heavy could throw off the unit’s balance. While small items work well in a vertical carousel, fragile items do not. The constant, rapid motion of the carousel can easily damage delicate goods.

The true beauty of a vertical carousel is that it combines high-density storage and high-speed retrieval technology in a small footprint. “Vertical carousels are the most effective way to reduce the amount of space used for small parts storage and gain control of small parts inventory,” says Brian Cohen, chief executive at Hanel Storage Systems (www.hanel.us) and also chair of the Material Handling Industry of America (MHIA, www.mhia.org) AS/RS industry group.

More small- to mid-sized companies are opting for carousels, Cohen says. “Car dealerships, for example, are installing carousels to hold spare parts and free up floor space for more work bays, which would generate more revenue,” says Cohen. “The same analogy works for storing production parts or consumables near an assembly station on the manufacturing shop floor.”

Take a vertical carousel, turn it on its side and you have a horizontal carousel. These serve the same purpose, but because they take up more space, they are used more often in manufacturing environments and distribution centers that have space and high throughput and picking demands.

“Horizontal carousels are ideal for split case or each picking,” says System Logistics’ Roy. “Split case picking is typically



Batch picking cuts dwell time and increases productivity. The carousels spin at different times so when the picker is ready, the product is ready.

best where replenishment activity is low, otherwise whatever you gain in productivity, you lose with replenishment.”

Roy also explains the development of the podless picking concept. “In a

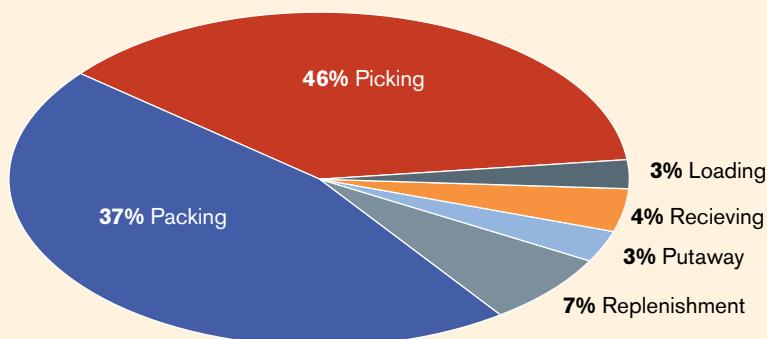
typical picking environment, a number of horizontal carousels are used to create a pod and each pod has to be staffed by a person,” he explains. “With podless picking, we may take a number of car-

ousels and install them as an equal face with no defined pod. The idea is that we have flexible staffing so that during a slow time, one operator can do all the picking. As we get busy during the day or during seasonal peaks, we can staff that array of carousels with more people. The ability to exercise dynamic, flexible staffing is much greater with a podless configuration.”

Carousels may also be getting a second look thanks to the interest in sustainability. Vertical carousels are incorporating regenerative braking systems that can capture the power that is generated from motors and brakes on the descent and put it back into the power grid. And because carousels save space, they can store more product in a smaller footprint than with conventional systems. One example is an expanded 48-inch bin. “By widening the bin, we expose more pick faces to the operator and allow them to fill the order with less movement,” says Roy. “There are more SKUs in a bin, which minimizes spin time required to retrieve parts and consumes less power.”

Where will MHE provide the greatest benefit?

According to the *Modern 2010 State of Materials Handling Survey*, Modern readers are seeing a slightly rosier picture in terms of equipment investment. Fifty-eight percent of respondents reported that they plan to increase their materials handling investments over the next three years. The largest slice, 46%, will be invested in picking technology, which can often include carousels.



Source: Modern Materials Handling Webcast: Modern 2010 State of Materials Handling Survey

New software, new strategies

While the basic functionality of horizontal and vertical carousels has not changed in recent years, advances in software and controls allow end users to make the picking process more cost effective. “We have decoupled the carousel from the picking process,” says Schaefer’s Lehr. “In a typical carousel application, a person stands and waits for the carousel to rotate so they can access the product. We’ve taken the picking workstation away from the carousel and connected it with a small conveyor system, enough to buffer the incoming product so that product is



An operator picks from a pod of horizontal carousels to fill an order. The integration of efficient conveyor and sophisticated control technologies assures high stocking and picking rates.

always available for the picker.”

Software develops the picking sequence so there is a constant steady flow of product from the storage medium to the person doing the picking, which cuts dwell time and speeds up productivity.

Productivity isn't the only thing picking up speed. As the economy makes slow, steady progress toward recovery, the interest in carousel technology is picking up. A lot of companies suffered layoffs during the economic downturn,

says Hanel's Cohen, but a lot of companies are able to get back to pre-recession production rates without bringing all the people back. Since carousels enable a company to meet customer service levels and demand with fewer associates, they can enable that strategy. “Many companies have used a bad time to become more efficient. And efficiency will pay off well beyond the return of the economy.” He added, “In a global economy we have to be innovative and effective to stay in the game.” □