

Sortation: Reliability meets scalability

Today's smarter sortation systems are handling the complex task of moving product through our warehouses and distribution centers faster and more accurately than ever.

By Lorie King Rogers, Associate Editor

In today's automated facilities, especially those trying to handle multi-channel order fulfillment, sortation systems are playing a vital role: these systems direct product to its ultimate destination—whether it's a packing station or an outbound shipping lane. And, just as advanced controls and software are making conveyors smarter than ever before, the same is true for sortation systems, which work hand in glove with conveyors.

"Sortation is an essential component of most systems being installed today," explains Clint Lasher, divisional president for Wynright. "At some point, the product flow inevitably needs to be separated by work process, shipping carrier, storage location or some other criteria."

That product flow is more complex than ever. While some customers are demanding a sortation system that is easy to install and commission, other customers are demanding maximum throughput, extremely complex divert schemes and a very diverse range of product shapes, sizes and weights, says John Clark, director of marketing for TGW Systems.

Here's a look at several trends mak-



In today's automated facilities product may move on many lines before it reaches its ultimate destination—and that's where sortation systems come into play.

ing an impact on the design and use of sortation systems in today's distribution centers.

Multi-channel retail: When it comes to shopping, consumers have never had it easier. They can walk into a store, order from a catalog or a television shopping network, or click a mouse to make a purchase. The industry calls this "multi-channel retailing."

When it comes to filling orders in a multi-channel environment, DC operators have never had it so tough. Facilities that once exclusively handled pallets and cases for wholesale distribution or retail store replenishment must now also handle individual items to fill e-commerce orders. Those items come in all different sizes, weights and shapes. They may be packaged in any number of materials, from corrugated to polybags. The sortation system has to be flexible enough to handle them all.

Add to those challenges the constant need to do more with less. "Sortation systems are being asked to handle all of these different products and packaging types while operating at reduced noise levels and delivering energy savings at the same time," says Tim Kraus, product manager of line sortation for Intelligrated.

Rather than turn to a third-party logistics provider or try to force the small order profile through existing sortation systems originally designed for large order store fulfillment, Krause says successful multi-channel operations have implemented unit sorters with flexible designs to meet both of these distribution channels.

Flexible sortation: The demand for flexibility is leading to new designs and functionality, like a flat sorter that has the ability to present 14,400 trays per hour past a single induction point. The system is designed to handle apparel or other lightweight products. Once product is inducted onto the sorter, it is dropped through a bomb bay



Handling as many as 450 items per minute, high-speed sortation equipment includes tilt-tray sorters.

door into a designated shipping carton.

What makes the type of system flexible is the ability to lay the sorter out in almost any facility. While many tilt-tray and flat sorters operate in an oval configuration, like a race track, this system has the ability to add horizontal and vertical inclines and left and right serpentine curves.

"The system doesn't care about the number of drop zones and it doesn't matter if the orders are for store replenishment or ecommerce," says Ralph Henderson, vice president of sales for SDI Group. "As long as the order information is entered correctly into the warehouse management system (WMS), it can handle the product."

Reliability and scalability: While there are a variety of sortation technologies on the market, including sliding shoe, pop-up wheels, tilt-trays, crossbelt and bomb bay, they share two important features: reliability and scalability.

"Reliability is always at the top of the list of requirements," says Lance Anderson, director of sales, sortation and distribution systems for Beumer. "But increasingly, scalability is an important factor when considering a new system." Anderson adds that scalability is increasingly important to the

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retailer that may already be supporting 500 or more stores nationally and now has to accommodate e-commerce growth as well.

Scalability is not simply adjusting for an operation's current peak demands, but also having a system capable of supporting future growth. "The idea is to assess where you are today and have a plan to expand the system later to accommodate future growth as painlessly as possible," says Gordon Hellberg, vice president of sales for Schaefer Systems International. "We

design a sortation system for today's peaks, but we need to provide a customer with a system that is scalable because they don't know what next year will look like."

New applications: Conveyor and sortation systems are making inroads into operations that were once mostly manual processes, such as reverse logistics. "We have one customer handling DVDs that have a high return rate," says Stephen Cwiak, vice president at Interroll. "At one time, they had large numbers of people manually sorting the returns to decide whether they could be sent right back out to another customer, returned to stock or scrapped." In its place, the customer developed a highly automated system to make most decisions and sort the DVDs to the right location for processing. Associates still examine the packaging to determine whether it has been damaged beyond resale, since the package costs more than a DVD.

Once that decision has been made, a WMS determines whether it is a valid SKU, whether there is another order in the queue for that DVD or whether it should be returned to stock. The sorter then diverts it to the right location for further handling. "With modern sortation machinery, you're getting more work done while using less energy, less space and with fewer people," says Cwiak.

Narrowing the gap: Just as software has transformed conveyor systems, it has also led to more efficient sortation systems. Gapping is a good example of this trend. Operations are able to sort at higher rates by keeping the spaces, or gaps, between products to a minimum. Instead of air, that recovered space can now be filled with more product.

In mid-range and high-throughput applications, modular diversion units transfer product quickly and gently from one conveyor to another. Unidirectional and bidirectional diverters allow for a variety of sortation combinations.





Mid-range sorters, which can handle throughput rates of between 30 and 200 cartons per minute, include sliding shoe sorters and are a good choice for handling inconsistent and delicate items.

The end result is a system that can run at a reduced speed and meet existing requirements. “Instead of running at 540 feet per minute to achieve the required rate for the application, the same rate can be achieved while running the sorter at approximately 440 feet per minute,” says Ken Ruehrdanz, warehousing and distribution market manager for Dematic. “Lower speeds translate into less energy consumption, less wear on the sorter and a longer life for the equipment.”

Conversely, the system can get even more throughput during peak periods by running at the original 540 feet per minute.

Go with the flow: Improved software is also allowing conveyor and sortation systems to make more complex decisions in real time at the machine level. That is leading to systems that take a holistic view of the flow of mate-

rial through a system, and not just through the sorter.

“The most significant advancement in sortation solutions today is the migration toward software architecture that treats all the associated sub-systems as one integrated sorter system,” Ruehrdanz says. “Therefore, pre-merge accumulation, merge, carton gapper, sorter and take-away conveyors operate in synchronization with each other.”

This holistic approach improves operational performance and simplifies the user experience. In a multi-channel distribution facility, where the optimal solution may call for a variety of sortation equipment in one sortation system, a smart sortation system allows these different technologies to be configured and controlled by one sortation control system.

Rather than reinvent the wheel, or the software that controls the wheels

Companies mentioned in this article

BEUMER: beumer.com

DEMATIC: dematic.com

INTELLIGRATED: intelligrated.com

INTERROLL: interroll.com

SCHAEFER SYSTEMS: ssi-schaefer.us

SDI GROUP: sdiinternational.com

TGW SYSTEMS: tgw-group.com

WYNRIGHT: wynright.com

and the sorters each time for each customer, the material flow package module is tweaked as it's worked into the end user's system, says Schaefer's Hellberg. “This approach is mutually beneficial, because it not only creates a customized solution, it shortens our time on site, minimizes the cost to the customer.” □