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September 2015

SPECIAL PACKAGING ISSUE

M&F Western Products: Bucking the backlogs 16

John Eddins, vice president of operations and Paul Eddins, chief financial officer

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Sealed Air acquires B+ Equipment

SEALED AIR HAS acquired B+ Equipment, a company headquartered in France that designs, manufactures and services automated packaging equipment for order fulfillment operations.

The acquisition includes B+'s proprietary flagship I-Pack system and the newly introduced e-Cube system, both of which provide intelligent, high-velocity fulfillment common in e-commerce. Sealed Air has had a longstanding relationship with B+ as the exclusive licensee of the I-Pack system in North America, Australia and New Zealand for more than five years.

"The Sealed Air acquisition strategy is focused on best-in-class, disruptive technologies that extend our leadership position," said Kenneth Chrisman, president of product care. "The acquisition of B+ further solidifies Sealed Air's position in the growing e-commerce market with a solution that focuses on reducing the cost of shipping and increasing productivity.

Konecranes and Terex merge

KONECRANES AND TEREX Corp. announced a definitive agreement to combine their businesses in a merger of equals. The combined company, to be called Konecranes Terex Plc, will be a leading global lifting and materials handling solutions company with estimated combined 2014 revenues of $10 billion and approximately 32,000 employees. The combined company will maintain headquarters in Finland and Connecticut.

"The combination of Konecranes and Terex is a defining step in the history of both companies," said Stig Gustavson, chairman of the board of Konecranes. "With a focus on lifting and materials handling solutions, Konecranes Terex will be in an excellent position to deliver enhanced growth in revenues and margins."

"We look forward to joining forces with them to build a stronger and more diverse company that will be in an excellent position to succeed in a dynamic and highly competitive global industry," said Ron DeFeo, Terex CEO.

PMMI announces Innovation Stage schedules for Pack Expo 2015

PACK EXPO OWNER and organizer PMMI, The Association for Packaging and Processing Technologies, released the schedule for the Innovation Stage at Pack Expo Las Vegas and the co-located Pharma Expo 2015 (Sept. 28–30; Las Vegas Convention Center).

More than 40 education sessions will provide insights into processing and packaging trends as well as challenges in food safety regulatory compliance, workforce development and measuring line efficiency.

"One of the greatest benefits offered by our on-floor educational programming is the opportunity for a 'cross-pollination' of ideas," said Maria Ferrante, vice president of education and workforce development at PMMI. "This enables attendees to tap the potential of practices and applications proven in one industry, but unexplored in their own." The preliminary schedule of presentations is available at packexpolasvegas.com and pharmaexpo.com.

Jungheinrich acquires MIAS Group

JUNGHEINRICH AG HAS acquired MIAS Group, which specializes in stacker cranes and load handling equipment.

By acquiring the MIAS Group, Jungheinrich is enlarging its technology portfolio in the field of automated warehouse solutions. "With the MIAS Group, we will continue to expand our logistics systems business substantially," said Hans-Georg Frey, chairman of the board of management of Jungheinrich AG.

Headquartered in Munich, the MIAS Group is an international equipment manufacturer in the warehousing and transportation technology sectors, where it offers stacker cranes and load handling equipment. In the 2014 financial year, the group generated $45 million in net sales. MIAS has more than 300 employees at five locations in Germany, Hungary, China, the United States and Italy.

The MIAS Group will be integrated into Jungheinrich AG's Logistics Systems division and continue to offer its products independently under the MIAS brand name.

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John Eddins, vice president of operations and Paul Eddins, chief financial officer

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60 seconds with... Charles Yuska, president and CEO, PMMI

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MICHAEL LEVANS
GROUP EDITORIAL DIRECTOR

Pay attention to packaging... or it will cost you

The most overlooked opportunities for greater supply chain optimization are pallet and packaging design—something we set out to fix this month in our Annual Packaging Issue. Starting on page 26, *Modern*'s editorial team has "packaged" articles that run us through the findings of our 2015 Pallet User Survey; make the case for elevating the roles of pallet and packaging design to a central part of supply chain planning; and share how today's packing stations are optimizing order fulfillment productivity.

Pack Expo taking place in Las Vegas (Sept. 28-30) this month was certainly an impetus for our timing; however, we see an ever-persistent disconnect among supply chain organizations when it comes to these critical links. In fact, the more the detachment widens, the more it's going to cost your operation—and not just thousands, but millions depending on your transportation budget.

"As much as the industry talks about supply chain integration and the dismantling of silos, pallet and packaging design is a classic example of how these problems persist," says senior editor Josh Bond, author of the Big Picture, "When is a pallet not a pallet?"

In his story, Bond shares a perfect example of the pitfalls of designing the supply chain one piece at a time—with each group focused on a specific objective—from Jack Ampuja, president of Supply Chain Optimizers.

"Jack describes a customer who went through a recent effort to cut packaging costs that saved them a nickel on each carton, but the move created another 25 cents per carton in freight costs," says Bond. "The packaging engineer is happy with his effort, however the transportation manager's budget just took a pounding."

And as long as operations are structured in this manner, one group might not recognize that what's good for one silo can be devastating to another and create significant costs that wipe out everyone's good intentions.

"Jack believes that the most successful projects start with a dozen people in the room, anyone with an oar in the water," says Bond. "And that's a good start. But when it comes to the concept of working with a supply chain organization on packaging design, he often hears the senior vice president of operations say it's not his problem—but he's only seeing part of the world."

But there's a bigger elephant in the room regarding the persistent disconnect between packaging and freight costs. As your colleagues in transportation management are well aware, 2015 is the year "dim weight' pricing for small package and less-than-truckload shipments will be making a significant impact on unsuspecting budgets.

"The majority of small- to mid-sized retail shippers are about as ready to manage dim weight as I am to take a rocket to the moon," says Ampuja. "I don't believe they know what's coming or have any idea of what to do other than wait and see what happens." Early projections are that one third of all small package shipments will see cost increases, with overall shipping cost increases jumping up anywhere between $500 million to $1 billion.

"Supply chain operations can either sit back, stay disconnected, ship inefficient boxes and pay more, or take action with their packaging engineers and carriers now," adds Ampuja. "It's up to them. However, by the end of this year and into 2016, we're going to see a lot of reactive scrambling to start building those connections."

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NEWS & TRENDS

MANUFACTURING

Study finds manufacturing ready for the Internet of Things

RESEARCH REVEALS 83% OF SURVEYED MANUFACTURERS EITHER ALREADY HAVE IOT IMPLEMENTATIONS IN PLACE OR PLANS TO DEPLOY WITHIN A YEAR.

BY JOSH BOND, SENIOR EDITOR

AMONG 600 MANUFACTURING companies surveyed, 97% of respondents believe the Internet of Things (IoT) is the most significant technology initiative of the decade. This is one finding from recent research conducted for Zebra Technologies Corp.

Jim Hilton, senior director and global manufacturing principal of Zebra Technologies, said in a recent interview that although the consensus is that IoT is important, there's less understanding of what it is.

"Everyone likes to walk around saying IoT these days, and the buzzword takes on the meaning of whoever just said it," Hilton said. "IoT is about enterprise asset intelligence and answers some important questions. What do you need to find out at a given point of activity—whether it happens on your property, at a vendor or elsewhere in the supply chain? From picking to trailer unloading to equipment service calls, you need that information in a timely manner so you can still do something about it."

Connected devices, equipment and processes are now enabling companies to find efficiencies in their own operations, but the IoT extends further, granting visibility into supply chain partners. "If something goes wrong, like a vendor bringing your trailer of goods to the wrong place, you need that visibility even when you don't own that function," Hilton said. "Without the speed, affordability and security of IoT technologies, that sort of collaboration would be a giant obstacle like it always was."

Hilton suggested the IoT involves the tracking of one or more of four main areas: goods, assets, people and processes. By collecting detailed information about even the smallest transactions, survey respondents expect their IoT initiatives will provide broader operational and actionable data that can be used to enhance supply chains, mitigate loss and risk, and empower process and cost optimization.

Other key findings:

- 83% of surveyed manufacturers either already have IoT implementations in place or plans to deploy within a year.
- Wi-Fi, real-time locating systems (RTLS), security sensors, bar codes, GPS and mobile computers were cited as the most important technologies for enabling IoT solutions.
- Half of the surveyed manufacturers cited cost concerns as the largest barrier to adopting IoT solutions while 46% indicated privacy and security concerns along with integration challenges.

Connected devices, equipment and processes are now enabling companies to find efficiencies in their own operations.

PACKAGING

U.S. protective packaging market to grow 4.48% by 2019

IN A NEW STUDY, "Protective Packaging Market in the US 2015-2019," analysts forecast the protective packaging market in the United States will grow at a CAGR of 4.48% over the period 2014 to 2019.

Protective packaging includes packaging solutions that preserve consumer and industrial products and equipment from damage during shipping and storage in industries including automotive, consumer electronics, appliances, pharmaceutical and retail.

One of the major trends emerging in the market is increased investment in research and development of environmentally friendly and sustainable packaging materials that can be recycled and reused.

According to the report, the demand for protective packaging is expected to grow because of an increase in its usage for e-commerce. The growing popularity of online shopping and the adoption of protective materials for packaging are expected to have a favorable influence on the protective packaging market in the United States.

Further, the report states that the rise in raw material costs is a major challenge for the protective packaging market in the United States. Leading vendors have increased the prices of their products to offset the effect of the rising costs of raw materials.

ROBOTICS

NA robotics market sets new records in first half of 2015

THE NORTH AMERICAN robotics market is off to its fastest start ever in 2015, according to new statistics released from Robotic Industries Association (RIA), the industry's trade group.

A record 14,232 robots, valued at $840 million, were ordered from North American robotics companies in the first half of 2015, an increase of 1% in units and 7% in revenue over the same period in 2014, which held the previous record.

"Robots ordered for use in coating/dispensing and materials handling applications grew 36% and 27% respectively through June," said Alex Shikany, RIA's director of market analysis. "Materials handling is the largest category we measure and touches many important industries to the robotics market. It's encouraging to see such

strong growth in this segment."

Shikany added that the notable increase in materials handling applications can be traced to the growth in non-automotive industries such as semiconductors/electronics, life sciences, and others. RIA estimates that some 232,000 robots are now at use in U.S. factories, placing the United States second only to Japan in robot use.

SUSTAINABILITY

RPA announces winners of Excellence in Reusable Packaging Award

SUBARU OF INDIANA Automotive, Herman Miller and Boulder Valley School District each earned an Excellence in Reusable Packaging Award from the Reusable Packaging Association (RPA).

Together, the three recipients achieved a cost savings of almost $16.5 million and prevented more than 28,000 tons of corrugated waste in landfills. Subaru and Herman Miller won the RPA award for businesses with revenues more than $25 million.

"The diversity of markets shows the versatility of applications for reusable packaging," said Jerry Welcome, RPA president. "All three winners clearly demonstrated the economic and environmental savings that can be achieved by implementing reusable packaging."

Subaru of Indiana Automotive—The manufacturer achieved a cost savings of nearly $16 million by re-purposing existing reusable packaging from earlier production lines and by replacing additional corrugated containers with new reusable packaging, which is now used for 95% of direct ship parts for the production of two 2015 models. The project removed more than 28,000 tons of cardboard from the waste stream.

Herman Miller—The company applied reusable packaging for outgoing shipments of furniture for the first time. By using reusable packaging rather than corrugated, the company saved more than $400,000 in material and freight costs, and kept 100 tons of waste out of the landfill.

Boulder Valley School District—The large school district saved $4,581 and kept 4,587 pounds of cardboard out of the waste stream by switching to reusable packaging for the delivery of apples and beef patties from the field and meat supplier to production kitchens and then out to individual school cafeterias, serving up 12,000 meals daily.

The winners will give presentations on their award-winning entries at the RPA's Reusables Learning Center at Pack Expo Las Vegas, Sept. 28-29. □

Avoiding a tight spot in narrow aisles

Narrow and very narrow aisle storage systems should strike a balance of costs and productivity, even as new solutions expand what's possible in a limited amount of space.

By Josh Bond, Senior Editor

When it comes to storage density and cube utilization, more is good. When you look at the people to access and manage the space, the fewer the better. Narrow aisle and very narrow aisle (VNA) configurations can meet a sweet spot between the two, but such a transition is not as simple as compressing space and equipment. According to Perry Ardito, general manager of warehouse products for Mitsubishi Caterpillar Forklift America, a series of trade-offs must be carefully measured to ensure the success of a narrow or VNA storage system.

"It's important to look at inventory, order profiles and movement and use it all to inform decisions for lift trucks, storage media, automation and whatever best suits short- and long-term goals," Ardito says, emphasizing that the ideal narrow aisle facility is likely to include a broad mix of narrow configurations, conventional ones and more. "Data can help an operation quantify and understand the inventory to be stored, the critical dimensions, the number of pallets and the movement of product, but one size never fits all."

SKU and labor pressures compel facilities toward the types of precision and efficiency that are baked into narrow aisle systems and the lift trucks within them. However, that specificity is also one of the biggest potential pitfalls. Narrow and VNA equipment is very specific to the size of the aisle, whether a turret truck in a 5- to 6-foot-wide VNA aisle or reach trucks in a 9- to 9.5-foot aisle.

"So if the lift truck is down for planned maintenance, there really aren't other pieces of equipment that can work in that aisle," Ardito says. "There is less flexibility there, not to mention the cost of a turret truck can be two or two and a half times the cost of a traditional reach truck."

The key trade-off is the increased productivity of a turret truck, which Ardito says could be double that of a reach truck, can result in overall fewer trucks and operators. And, since the operator is only required to move forward, backward and vertically, they don't have to turn into a location,

reducing opportunities for damage to product or racking.

On the other hand, because turrets are often dedicated to putaways and picks in a specific aisle, they will not necessarily have the versatility to perform tasks elsewhere. However, Ardito has already seen creative combinations of technology that emphasize the strengths of each component. Whether segmented by SKU or by movement, there might be a mix of high-density storage, selective storage, automation or less-than-full-case picking, he says.

"I have seen turrets working in VNA alongside a multi-level pick module, incorporating multiple technologies in the same building," Ardito says. "What's very likely is a stronger push toward semi-automation and full automation driven by cost awareness, specifically the cost of labor.

Shuttles offer high density, so in lieu of traditional forklifts to feed high-density systems, you might incorporate automated storage and retrieval systems, and/or automated pallet movers. Everything is on the table, and more customers are open to technology and multiple ways of managing an operation."

Josh Bond is Modern's *senior editor and can be reached at jbond@peerlessmedia.com*

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Automated system replaces manual insertion, application of customized documents

For operations with multiple pack stations, automation can improve accuracy and productivity when handling pouches, envelopes and small parcels.

By Sara Pearson Specter, Editor at Large

According to Forrester Research, by the end of 2015 U.S. business-to-consumer online sales will hit $334 billion (nearly 10% of all sales), while business-to-business e-commerce receipts will reach $780 billion (9.3% of all sales). That translates into a lot of small parcels, bags, cartons and padded envelopes.

More operations are adding customized documents to every parcel—such as a packing slips, special offers, warranty information, instructions or directions for use, or pharmaceutical inserts—in an effort to encourage repeat orders and foster better brand loyalty, explains John Panunto, president of PSI Engineering.

"Matching personalized paperwork to the correct order can not only be a challenge, it can also be very costly to accomplish manually," he says.

Automation, says Panunto, can improve accuracy and productivity in an area that can otherwise cause bottlenecks, particularly for operations with multiple pack stations handling either open or closed case orders.

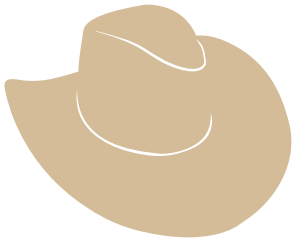
"Having an automated system that can generate an integrated packing slip, fold the documents into a pouch, and apply it to the outside of a carton allows an operation to utilize a single outbound conveyor line for handling a variety of parcel sizes and shapes—as well as either open or closed cases," he says.

Distributors of electronics, for example, often ship electronic goods in their own packaging instead of reboxing, Panunto adds. "You wouldn't open up an already sealed case just to add a packing slip or a coupon."

To automate the application of customized information to small parcels, PSI Engineering developed the MVP Packet system. The equipment first scans target parcel's license plate number (LPN) bar code to match the order to the required documents. It then prints variable information on one or both sides of standard, 8.5 x 11-inch paper, folds each sheet into quarters (or smaller), and inserts it into a plastic sleeve pouch. Integrated sensors detect the height of the target parcel, while a second scanner verifies a correct pouch to parcel match before applying the completed packing slip to the outside of the carton.

"A single machine can handle both bags and padded envelopes, as well as sealed and unsealed cases ranging from 6 to 30 inches tall," adds Panunto. "Throughput ranges from 15 to 20 parcels per minute, depending on the dimensional variety traveling along the conveyor line."

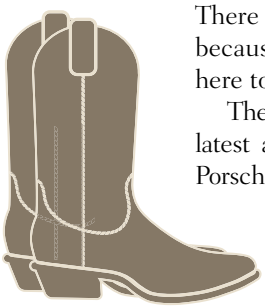
Sara Pearson Specter is an editor at large with Modern *and can be reached at sara@saraspecter.com.*



Working through the backlogs at M&F Western Products

The leading supplier of western wear accessories installed a WMS, conveyor and batch picking at its new facility. As a result, the company is no longer dealing with backlogs while accommodating growth.

By Bob Trebilcock, Executive Editor



People don't go to a car show to look at the minivans or compact cars. They want to see the luxury vehicles and the sports cars. After all, those vehicles are sleek, fast and flashy. But, when it comes to picking up the kids at soccer practice, let's face it: There are a lot of Civics and Grand Caravans in the parking lot because that's all most of us need, or can afford, to get from here to there.

The same idea is true in materials handling automation. The latest automation and robotic technologies are the BMWs and Porsches of our industry. Yet, the vast majority of distribution cen-

From left: John Eddins, vice president of operations; Paul Eddins, chief financial officer; Mickey Eddins, company founder; and David Eddins, product development

Shannon Faulk/Getty Images

In M&F Western's new order fulfillment center, a WMS introduced organization, optimized storage and system-directed picking to the operation.

ters are still struggling to get things out the door because they're paper-based and manual. To get to the next level of productivity, most operations need some basic automation, data collection tools and a Tier 2 warehouse management system (WMS).

This was certainly the case at M&F Western Products, a nearly 50-year-old, family-owned wholesaler of western wear accessories located in Sulphur Springs, Texas—everything from belt buckles to western boots and hats. Founded by Mickey and Linda Eddins, who are still active in the business, it is managed by their sons Paul, who is CFO; John, who is vice president of operations; and David, who is in charge of product development. The company's go-to-market strategy is to maintain a large inventory ready for immediate shipment, according to Paul Eddins. "We have a lot of competitors for different categories, like hats," he says. "However, we stock deep in every category. We are your one-stop shop for all of your western wear accessories."

M&F Western's challenge in recent years was to keep up with growth. With a mishmash of facilities and paper-based fulfillment operations, M&F Western struggled to get orders out the door. To improve efficiency and throughput, the brothers worked with a system integrator and designer (enVista, envistacorp.com) to modify a WMS and then design a new 100,000-square-foot, pick-and-pack area in one of its existing facilities, complete with mobile computing and bar code scanning, a conveyor system and three pick zones, including a mezzanine.

It's not flashy—the conveyor system is simple and order selectors still hand scan items to carts—but by using a pick-and-pass, batch picking methodology and a recirculating conveyor at the pack stations, the backlogs are gone. "We're paperless, we're organized for efficiency and we don't get bogged down, even during our busy season," says Paul. "And, we have excess capacity for growth. We've never had that before."

Out of space, out of time

Founded in 1969 by Mickey and Linda Eddins, M&F Western is the leading distributor and manufacturer of western wear accessories. "We have the largest inventory on hand, the quickest distribution and the latest fashions," says Paul. "We built our reputation on fast, consistent shipping of quality western accessories."

The company can ship up to 99% of new orders from stock and growth has been constant. "Going back to 2005, we had about seven straight years where we grew 10% to 25% per year," Paul says. That was a problem: Pick-and-pack operations couldn't keep up with the volume of orders. "Our peak season begins in November and continues through January, when the biggest trade show of the year is held in Denver," says Paul. "During peak, we needed up to 10 business days to ship and just couldn't catch up."

M&F transitioned from a conventional warehouse to one with targeted automation, like this conveyor system, for greater efficiency.

The Eddins brothers attribute the bottleneck to the way the company had expanded its operations over the years. A 130,000-square-foot, pick-and-pack facility was located at its company offices. Meanwhile, it built smaller buildings for storage on a separate 9-acre tract of land as needed. By 2011, trucks were making a dozen trips a day between the storage locations and the pick-and-pack operations. And, due to a poor layout in the pick-and-pack operation, order selectors just couldn't keep up. Paper-based processes compounded the problem.

"Our pick locations were too small, so we had to replenish a couple of times a day," says John. "Replenishers were trying to work in the same aisles as pickers. And, a picker walked a pick cart through the entire warehouse to fill an order. We knew we had to do something."

Incremental change

Rather than do a Big Bang and roll out everything at once, the Eddins brothers took an incremental, step-by-step approach to improving their operations. While slow, each new step leveraged the previous steps.

This process began in April 2012 with the implementation of a WMS. Prior to this, M&F Western relied on an inventory management module with limited tracking capabilities in its enterprise resource planning (ERP) system to know what it should have on hand. Pick tickets directed an order selector to the pick location where product was supposed to be, but that didn't necessarily mean the stock was there. Replenishment orders weren't entered for depleted pick faces until the end of the day. "There were few inventory rules in place if someone picked up a product and moved it to a new location or if a location was depleted," John says. "We had limited visibility into where product was located."

To ease the transition, M&F Western initially continued to issue paper pick tickets. That was followed by having order selectors scan a bar code on a pick ticket to receive instructions, but still pick one order at a time. The WMS and automatic data collection brought discipline and visibility to other processes, such as directed putaway into a pick location and replenishment that was driven by min/max levels. "Once we got through the learning curve, we saw improvements in productivity and accuracy," Paul says.

Still, those improvements were overshadowed by the continued growth of the company. "We had much better visibility into who was picking what orders, but during peak season, we

Order selectors are assigned to one of three zones and pick to carts. Totes are then inducted onto the conveyor system.

The conveyor transports totes from the pick zones to the packing area, which includes separate processes for single-item and multi-item orders.

were still processing orders that were three or four days old," says John. "We just couldn't seem to get ahead."

New facility, new design

Once the WMS was in place, M&F Western brought in a system integrator to help with modifications, such as entering weights and dimensions so the system could containerize the orders it was releasing to the floor. Then, in the fall of 2012, the brothers broke ground for a new facility on the 9-acre tract of land. "We knew we needed a new building, but we still had a lot of questions about what we were going to do differently," says Paul.

Those questions included the layout of the facility, how to make the best use of the square footage and cube of the building, and what level of automation would meet their present and future needs. The system integrator helped them select the right equipment for their operations, and designed the layout, flow and new processes for the facility.

For instance, the new facility features a conveyor system to induct orders, route the totes through various picking zones and deliver them to packing and shipping. "We did a cost-benefit analysis of a number of new technologies and realized we didn't need a high level of automation," says Paul. "But, the conveyor system helps reduce travel time."

A second big change was the implementation of three distinct picking zones to enable pick-and-pass batch picking. One pick zone is a one-level picking area; the other two zones are on the two-level mezzanine. In the old facility, an order selector had to walk the entire warehouse path to pick an order. In the new facility, order totes are sent to pick zones with items for that order.

Order selectors still place the totes on carts to do their picks, but they are only responsible for their picking area. Once everything is picked, the totes are conveyed to the next zone or to packing. "Associates are still walking, but if you have an order with five totes, they can be picked simultaneously in the other zones," John says.

Using a mezzanine over the floor for one area optimizes the cubic space in the facility. The design of the pick locations, which are large enough to hold two master cartons, also help to maximize space.

"Each location can hold 20 days of inventory, and we set the min/max levels so that we replenish in full master cartons," says Paul, adding that cartons replenish from the rear of the carton flow rack so as not to interfere with picking. "That may be more inventory than we need, but it makes replenishment simple and efficient. Pickers are no longer waiting for replenishments to complete their orders."

Containerization allows the order inductor to make decisions about what orders to release to even out the workflow.

Finally, a recirculation conveyor in the packing area organizes totes for a packer. If one tote of a multi-tote order arrives early, it recirculates until the rest of the order arrives at packing.

The facility went live in July 2014, and was brought up to speed incre-

Change doesn't happen overnight

Transitioning from a conventional, paper-based distribution operation to a system-directed, semi-automated facility is allowing M&F Western to meet growth. However, change doesn't happen overnight, says vice president of operations John Eddins.

"We made incremental steps, but, by taking that approach, each new thing we did built on what we had done before," Eddins says.

That may be the most valuable lesson for any distributor making the same moves.

The biggest learning curve may have been moving from paper to system-directed processes. "Associates suddenly had this new mobile device in their hands," he says. The good news, he adds, "is that most employees realized it was going to make their job easier because they would have fewer decisions to make."

Now that the system is up and running, the learning curve for new employees is much faster than with a conventional system. "In the past, everything our people did was based on tribal knowledge," Eddins says. "People learned over time just by being here. Now, with a system in place to direct them, a picker gets pretty familiar with picking in a week or two."

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mentally over a three-month period. By October, it was operating as promised. "November 2014 was the biggest month in the history of the company, and we got through it with no backlog and very little overtime compared to previous years," Paul says.

While many companies measure the success of their new systems by percentage increases in throughput or cartons handled per hour, the measure of success to the Eddins brothers is that they are getting orders out the door as they are received; orders are more accurate while they are spending less on overtime; and they have excess capacity while still growing at a healthy clip. "We're paperless; we're organized; we can get things out the door; and we don't get bogged down," says Paul. "We've never had that before. □

The right automation for the job

A WMS, bar code scanning and conveyor and sortation system have significantly increased productivity and throughput at M&F Western Products.

A new distribution center featuring a warehouse management system (WMS), mobile computing and bar code scanning, conveyor, and three pick zones (including a two-level mezzanine) has eliminated order backlogs at M&F Western Products.

Receiving: New merchandise is unloaded from shipping containers or trucks in the receiving and shipping area (1). Items are inspected, palletized and entered into the WMS. The system then creates a license plate bar code. Pallets are staged (2) for putaway, or, if an item is out of stock, the WMS generates a replenishment order.

Storage: The WMS directs putaway. Items needed for replenishment will be delivered directly to a picking location in the pick module (3) or mezzanine (4), where they are scanned into a pick location. If there were only

M&F Western Products Sulphur Springs, Texas

TOTAL SIZE: 230,000 square feet
PRODUCTS: Western wear accessories
THROUGHPUT: 20,000 lines per day at peak
SKUs: 12,000 pickable
SHIFTS PER DAY/DAYS PER WEEK: 1 shift; 5 days per week, plus overtime during peak season
EMPLOYEES: 100

a few cases of an item on an inbound shipment, they may be stored in an overstock location directly above a pick location. Otherwise, the WMS will direct the lift truck operator to deliver a pallet to the nearest available location in reserve storage (5). Drivers also have the ability to override the WMS and choose a pick location. Either way, all movements are captured by a bar code scan of the item, the location and the quantity.

Picking: To initiate picking, the WMS sends a task to an order inductor (6) indicating the number of totes needed for that order. If, for instance, the order requires four totes, the order inductor will scan and place four totes on the conveyor. The conveyor routes a tote to one of three picking areas: Either a stand-alone, floor-level picking module (3) or one of two mezzanine levels (4). A tote may visit all three zones to get all of the items required to fill an order. Once the tote arrives in a zone, an order selector in that area scans the tote to a cart that can carry up to 10 totes at a time. The WMS then directs the order selector to a location, where items are batch picked to totes. That process repeats until all of the items in that zone have been picked. Totes are then placed back onto the conveyor and routed to the next zone.

Packing: Once all the items for a tote have been picked, the tote is conveyed to the packing area (7). Totes may go directly to a pack station or to a recirculation area if other totes are required to complete an order. Fast pack stations (8) are designated for single-item or single-tote orders. Multi-tote pack stations (9) handle orders that include items from multiple totes. Either way, a packer scans the bar code on the first tote at the station and then scans the items for that order into a shipping container.

Shipping: Once all the items are in a container, the packer is asked to verify the weight. If the order appears accurate, the shipping system generates a shipping label. The package is placed onto a takeaway conveyor and sorted (10) to the staging area (2) for shipping (1). There it is loaded onto a pallet for either UPS or FedEx shipping. ☐

System suppliers

SYSTEM DESIGN AND INTEGRATION: enVista
WMS: HighJump
SHIPPING SOFTWARE: Creative Logistics (InfoShip)
CONVEYOR AND SORTATION: Hytrol
MOBILE COMPUTING: Honeywell
LIFT TRUCKS: Crown Equipment, Nissan
PALLET RACKING AND MEZZANINE: Elite Storage Solutions

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Modern's annual reader survey shows how trends in pallet use point to priorities around cost control, customer compliance and operational efficiencies. More customers are asking for pallet type changes and having minor availability issues with used wood pallets, while pallet cost and durability continue to be dominant decision factors.

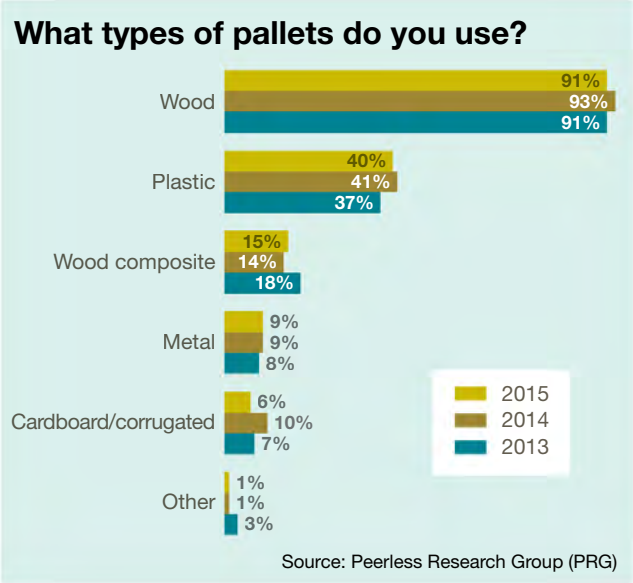
Roberto Michel, Editor at Large

PALLETS as a *REFLECTION* of your business

With most everything supply chain, if you follow through on what the customer wants, and do it at a low cost, you are usually going to come out on top. Perhaps it's no surprise then, that *Modern* readers' pallet usage reflects these fundamental aims of supply chain management.

For *Modern*'s annual survey of readers who use pallets, Peerless Research Group surveyed subscribers of *Modern* as well as a sample of recipients of our e-newsletters. We received 355 qualified responses from those employed at a location that uses pallets.

Respondents reported that purchase price was once again the leading decision factor with a 60% response rate, followed by strength and durability. Yet pallet choice isn't quite as simple as choosing the strongest, lowest-cost option. Respondents also reported a slight increase in customer-driven pallet requirements. When asked if customers



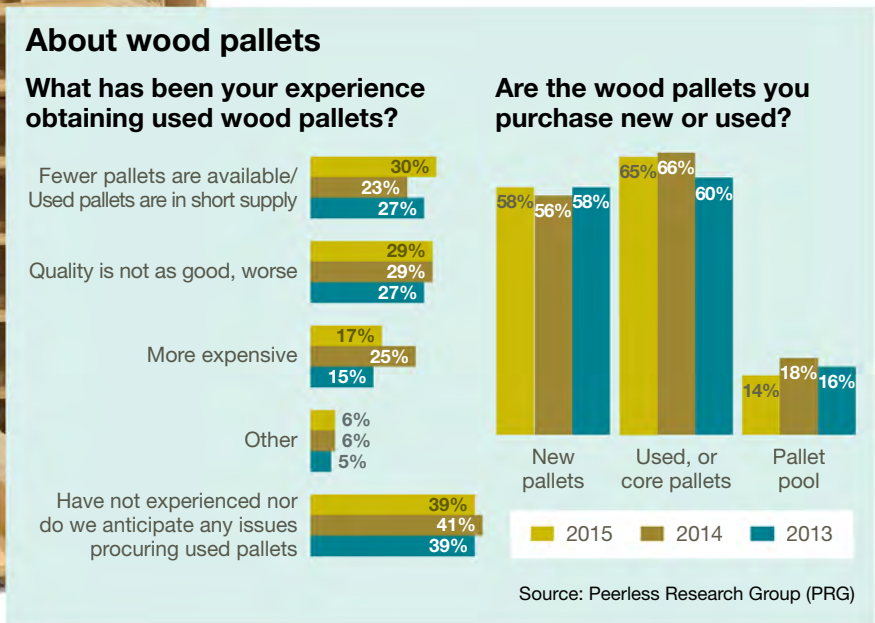
had asked for changes in pallet usage during the past 12 months, less than 17% affirmed there had been customer requests for change, compared to just more than 15% who answered "yes" to that question in the 2014 survey.

This uptick in customer-driven pallet change may be slight, but it is consistent with the dual supply chain pressures of having to respond to what customers want, and do it at a low cost. In other words, use of the humble pallet often mirrors broader supply chain pressures, most of which are customer-driven, according to the "2015 MHI Annual Industry Report." The report found that "customer pricing pressure" and "rising customer service expectations" were two of the top three most challenging issues for supply chain professionals.

Modern's 2015 pallet user survey also points to how pallet rental and pooling strategies continue to evolve as companies look for ways to ensure pallet availability while controlling costs and outsourcing much of the work involved with pallet management.

In other key trends from the 2015 survey, wood pallets continue to dominate the market, but respondents report at least some availability issues with used wood pallets, more purchasing of new wood pallets, while use of block pallets gained some ground on use of stringer pallets. The percentage of readers saying they expect to use more plastic and metal pallets over the next 12 months also saw upticks.

Readers also reported a slight increase in international pallet shipments, though most do not see this rising much over the next two years. Other sources, such as research firm Freedonia



Group, predict a growing pallet market worldwide, with 5% annual sales growth expected through 2017.

Purchasing priorities

Respondents were asked to choose between multiple factors driving their choice of pallet. Once again, purchase price was the most frequently named driver, with a 60% response rate. Other leading factors include:

- 58% strength,
- 48% durability,
- 41% reusability,
- 40% customer requirements,
- 36% cost per use, and
- 32% availability.

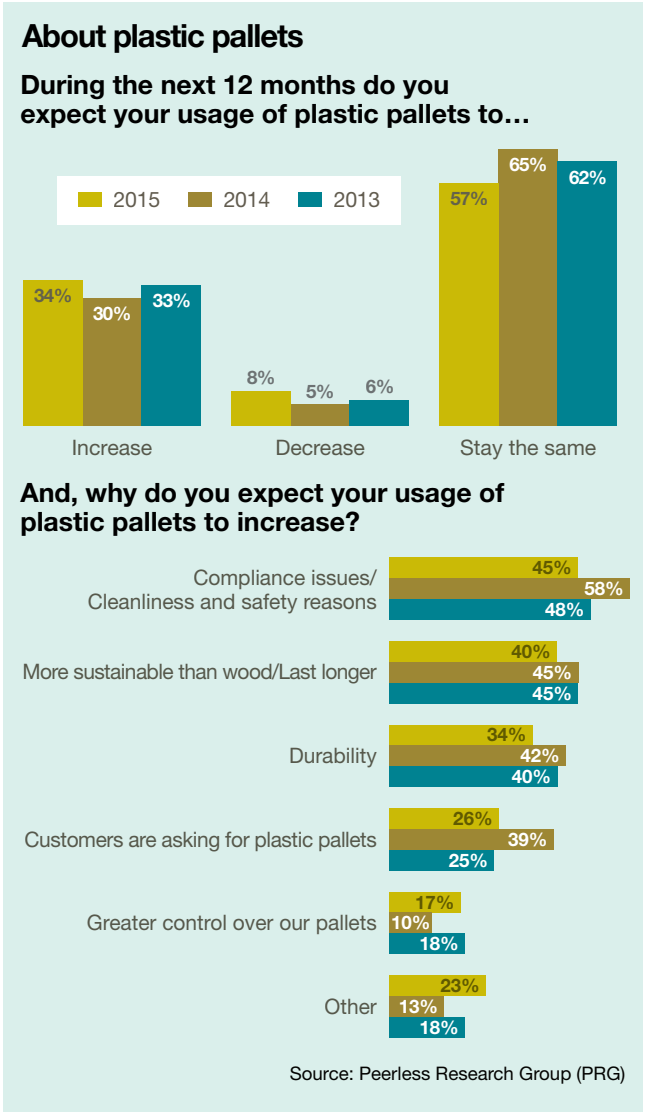
Most of the purchase influence factors remained near the same response level as last year, with some minor variations. For example, durability dropped from 54% in 2014 to 48% this year, customer requirements dropped by 5%, and "reusability" was at 41% this year versus 44% last year. In the other direction, recyclability rose from 20% last year to nearly 27% this year, and "weight" bumped up by 2% as a decision driver.

Wood pallets are used by 91% of readers, down slightly from 2014's 93% response. Alternative materials are also commonly used, including:

- 40% plastic pallets,
- 15% wood composite,
- 6% cardboard/corrugated, and
- 9% metal.

Use of alternative materials experienced only minor changes in response rates versus 2014's survey. For instance, use of wood composites is up from just less than 14% last year to 15% this year.

Use of cardboard/corrugated pallets was down close to 3%, while those reporting use of plastic and metal pallets was down by less than 1%.



While slightly smaller percentages of *Modern*'s readers reported current use of plastic and metal pallets, the outlook for using more pallets made from alternative materials was on the upswing. For instance, 34% say they expect to use more plastic pallets during the next 12 months, up from 30% in 2014's survey. While a majority of respondents said plastic pallet use would "stay the same" (57%) only 8% forecast a decrease in their use.

The top reasons for plans to use more plastic pallets were "compliance and cleanliness/safety" (45%) followed by "more sustainable than wood/last longer," named by 40%. Other reasons cited for plans to use more plastic pallets included:

- plastic pallets are more durable than wood (34%),
- customers are asking for plastic pallets (26%), and
- greater control over our pallets (17%).

Plans to use metal pallets are on the upswing. Of those respondents already using some metal pallets, 21% say they expect to increase metal pallet use, 68% expect usage to stay the same, and 9% expect some decrease. That's a significant increase over the 8% of metal pallet users who last year said they expected increased use, although the raw numbers of respondents for this question was small in both years.

The 48 x 40-inch pallet is easily the most commonly used pallet size, cited by 86% of readers. This was consistent with the 84% of readers that reported using 48 x 40-inch pallets last year. Just more than 19% of readers are using the 42 x 42-inch size, while more than 14% reported using 48 x 48-inch pallets. Less than 5% are using 24 x 20-inch half pallets.

The number of respondents using pallets to ship internationally (taking into account those that ship both domestic and international, and those that ship solely internationally), was less than 61%, up from 57% the previous year. Domestic shipping by pallet stood at 39% this year, down from 44% last year. Only 3% ship on pallets solely to international customers.

The leading countries/regions to which goods are shipped continue to be those with U.S. borders, with 80% of readers shipping to Canada, down from 87% the previous year, followed by 71% shipping to Mexico/South America/Caribbean, down from 82% in 2014. The percentage of readers shipping to Western Europe is at 45%, down from 52% last year, while 33% of readers ship to Eastern Europe, down from 41% last year.

While less than half of respondents (35%) said the number of pallets they ship internationally has increased during the past two years, readers are more optimistic for the next two years, with 45% saying they expect to ship more pallet loads internationally.

Readers may do some things differently when shipping pallets globally, with only 23% reporting that they don't do anything differently. Some of the strategies include:

- 39% treat their pallets,
- 12% use alternative materials other than wood that don't require treatment,
- 23% use wood pallets from their own pool, and
- more than 4% use a pallet pool for international shipments.

Wood pallet highlights

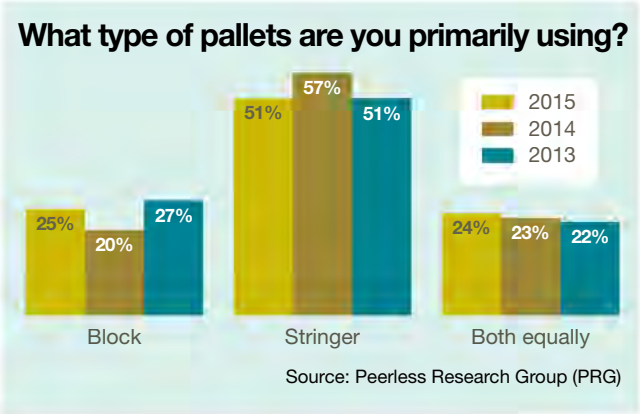
With 91% of readers reporting wooden pallet use, this traditional material remains nearly universal. A notable trend with wood pallets is some increase in availability challenges for used wooden pallets, as well as slightly more use of new pallets, which is perhaps not surprising given the economic growth of the last couple of years coming off of a deep recession.

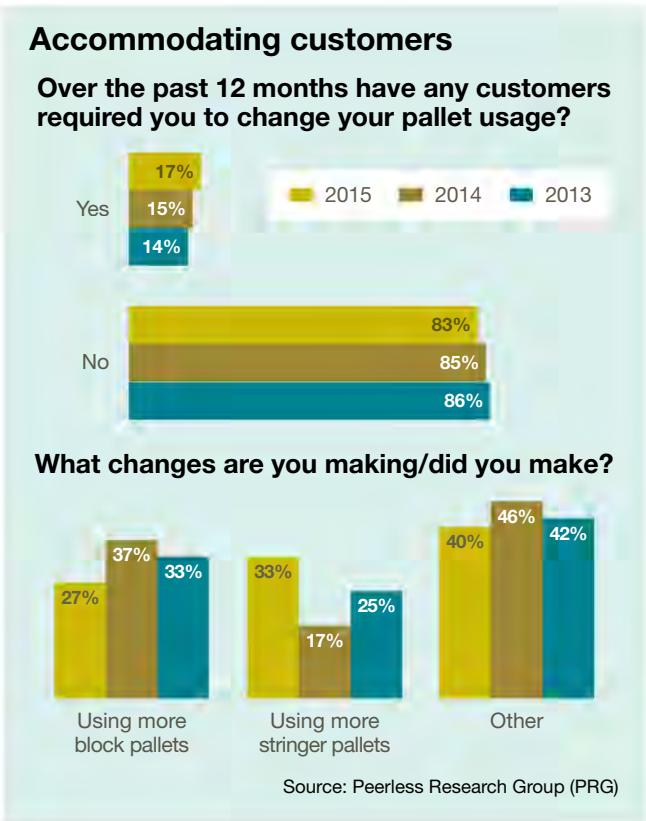
When asked to describe their usage level for used wood pallets, 65% of respondents said they purchase used pallets, nearly even with last year's 66% who bought at least some used wood pallets. New pallets were purchased by 58% of readers, up from 56% last year.

When asked to describe their level of use for wood pallets, only 39% of readers said they were using more of them, a decrease of 14% from last year's 53% response. More than 13% say they are using fewer used wood pallets, up 2% from last year.

When asked what their experience has been this year in obtaining used wood pallets, more than 30% said there are fewer available, up from 23% in 2014. However, 17% report used wood pallets are more expensive this year, which actually is a decrease from 25% last year. Additionally, the proportion of respondents reporting no issues procuring used wood pallets held fairly steady at close to 40%.

In response to availability issues with used wood pallets, 53% of readers say they will buy more new pallets, and 18% say they plan to create and manage their own pools. Additionally, 9% say they plan to rent from a pallet pool such as those from CHEP, PECO and iGPS. These percentages were nearly identical to the responses from the 2014 survey.





Block pallets gain

Several years ago, when retailer Costco began requiring block pallets, the thinking was that other major retailers of groceries and consumer goods would follow suit and trigger a major move to the block pallet versus the more traditional stringer pallet design. That major move hasn't materialized, but block pallets have gained a toe hold on the market, and this year's survey results indicate greater uptake for the design. That said, the stringer pallet remains the mainstay design.

This year, 25% of readers say they are primarily using block pallets, up from 20% in the 2014 survey. And, 51% of readers say they are shipping primarily on stringer pallets, down from 57% last year, while the percentage of respondents saying they use both equally stood at less than 24%, less than half of percentage point increase from 2014.

While these results might appear to indicate a significant move to block pallets, only 27% of respondents say they are using more block pallets this year, which is 10% less than the 37% who last year said they were using more block pallets. However, 17% of readers answered "yes" to "have customers have required changes to pallet use?" up from 15% who answered yes to this question in 2014.

Changes are being requested from a variety of points in the supply chain:

- manufacturer (33%),
- retailer (35%), and
- wholesaler (28%).

The biggest change in the type of trading partner requesting a change in pallet use is from manufacturers, with a 9% decrease in requested change from manufacturers. Change requests from retailers increased, from 29% last year to 35% this year.

Pooling/rental evolution

Pallet rental and pooling solutions are a way of addressing availability and predictable costs, while allowing users to focus more attention on what they see as the core challenges of moving goods and filling orders. While pooling and rental approaches have seen significant increase in sectors such as consumer goods and grocery, many facilities still continue to buy and manage their own pallets. At the same time, use of rental, recovery and pooling approaches continue to evolve.

When asked if their companies rent pallets, plan to rent, or use a retrieval/recovery provider, 29% of readers say they use a pallet rental company, down sharply from 50% last year. However, another 29% this year say they are using another type of pallet retrieval or recovery system, up sharply from 7% last year, so the combined use of some type of rental or recovery solution actually remained fairly steady, with only 41% saying this year they do not use one of these two approaches, compared to 43% last year.

Looking forward, more than 21% of respondents say they are highly likely or likely to consider participating in a pallet retrieval/recovery system or in a third-party pallet rental system during the next year, up from 17% last year. At the same time, 68% say they are "not very likely" or "not at all likely" to participate in one of these approaches, a slight decrease from 71% of respondents last year. So while it's not exactly a big bump in plans to rent or pool, these findings can be taken as some indication of continuing acceptance for these approaches.

When asked whose pallet rental or pallet management system they participate in or would consider, the leading answer at 51% was "self-managed," down from 62% last year. Meanwhile, 28% of respondents say they have evaluated or considered a solution for managing their own pool, up from 26% in 2014.

When readers were asked how interested they would be in using a pallet pooling service managed by the pallet industry as an alternative to established pools managed by CHEP, PECO and iGPS, more than 14% are "interested," and 2% are "highly interested," compared to less than 7% interested and less than 2% very interested last year, so an increase of roughly 7% in interest when combining these two selections year over year. Still, nearly 61% this year said they are "not very" or "not at all" interested in this type of service.

Pallet management trends mirror the cost conscious, customer-driven nature of supply chain management, even if many logistics and warehouse professionals would rather have someone else handle pallet management for them. But with a growing economy, and more respondents indicating at least some availability issues with used wooden pallets, as well as more customer-driven change in pallet types, staying current on pallet trends remains important to meeting basic aims of cost control and customer service. ☐

About the survey respondents

In this survey, most of the 355 respondents (54%) are involved in manufacturing, with a wide variety of industries represented. Wholesale distributors of both durable and non-durable goods (20%) and retailers (8%) are also represented. Last year, there were a greater proportion of manufacturers (61%) among the respondents.

The respondents represent a solid mix of large companies with revenues more than $1 billion (18%), mid-sized companies with revenue of between $250 million and $999 million (13%) and small companies with revenue below $250 million (69%).

Suppliers are shipping into the supply chains of major retailers, big box store operators and grocery store chains, including Walmart (30%), major grocery chains (20%), Costco (23%), Target (18%) and Sam's Club (22%). Readers are also shipping to BJ's, Home Depot, Lowe's, Walgreens, J.C. Penney and Macy's.

When is a pallet

Packaging design is often low on the totem pole, yet expected to safely ferry materials throughout the supply chain.

Experts make the case for elevating the humble roles of pallet and packaging design from a fragmented race for savings to a central part of an optimized supply chain.

By Josh Bond, Senior Editor

Pallets and packaging have a hard life. As they carry goods through the supply chain, they bump and skid against an unforgiving assortment of lift trucks, conveyors, trailers, automated storage, racks and even floors. And if that isn't tough enough, packaging rarely enjoys the money and attention paid to all of its assailants.

"If you sat around with 20 supply chain people and asked for their definitions of the supply chain, few would even put packaging on the list alongside functions like receiving, transportation and the like," says Jack Ampuja, president of Supply Chain Optimizers and executive director of the Center for Supply Chain Excellence at Niagara University.

When packaging and pallets do get attention, he says, it's often in a vacuum. "I visited a customer who was shipping one layer of pallets on trucks from the factory to minimize damage from stacking. They explained a recent effort to cut packaging costs that saved them a nickel on each carton. But they had created another 25 cents per carton in freight costs, and they couldn't see that it was not a good trade-off."

Despite the close connection between packaging and freight costs, two different people are often responsible for each. Packaging, pallets,

not a pallet?

forklifts and equipment of all kinds are each designed by one stakeholder, bought by another and used by yet another, says Mark White, president of White & Co. As a result, White says, we've been designing the supply chain one component at a time with each community focused on their specific objective. Companies structured with these silos might not even recognize that what is good for one silo can be catastrophic for another and create significant avoidable costs.

For instance, say a purchasing agent is tasked with extracting 4% from all vendors. "The pallet designer then works to pull 4% out, which changes the stiffness of the pallet deck," White explains. "Then the packaging designer tries to shave some thickness from bottle walls, but has no idea the new, more flexible pallet will increase compression stress on the bottle."

You might be familiar with the resulting spate of bottled water unit load failures a few years ago, but the industry has made slow progress toward a more holistic, systems-based approach to packaging design that could prevent such failures. A growing body of research is helping to quantify the opportunities, but uniting the nodes of the supply chain around packaging—arguably its least popular component—is easier said than done.

Initial investments in reusable packaging can create savings across the supply chain, but can be difficult to justify.

The design of automated systems and of the pallets they handle are often completely divorced.

Thinking outside the silo

The biggest problem is corporate politics, White says. "Successful packaging design can only come from a team approach where all stakeholders try to understand how packaging, pallets and all shipping and storage systems interact," he says. "Unfortunately, when they're told they can increase the cost of the pallet to create savings elsewhere, the common response is: 'over my dead body will we pay more.'"

Of course, that's exactly what these companies end up doing. Ralph Rupert, manager of unit load technology at Millwood, says that an organization's separate measures of savings and success across departments can create adversarial relationships among supposed team players. In this environment, even the well-meaning concept of sustainability can quickly go awry. He again refers to the bottled water example.

"When the packaging designer changed the bottle, it was more 'sustainable,' right? And the pallet was more sustainable after the pallet designer made his changes,"

Rupert says. "Companies are working to make each component more sustainable, and each stakeholder did their small part, but now the system is unsustainable and doesn't work. If purchasing is not held accountable for product damage, the poor warehouse guy is getting beat up while the purchasing agent just made his bonus."

Ampuja says packaging has been called "the next frontier in logistics costs," but for now the unrecognized opportunity is more like "the bastard child of corporate America." Sometimes it's handled by marketing, driven by the customer, folded into manufacturing or vested with engineering. "Umpteen people might be involved," Ampuja says. "Maybe 10% of the supply chain cost is made up by packaging, and the other 90% is warehousing and transportation. Do you want any one stakeholder making a decision for the 10% that impacts the other 90%? Of course not."

This is assuming a company even knows who is accountable for packaging costs. Ampuja cites an example of talking to a packaging executive at a big food company about revising packaging for improved logistics, and the executive said, "I don't know why you are here, because this is a logistics issue," Ampuja recalls. "I walked down the hall to the head of logistics and he said he didn't know why I was there and sent me back to the other executive. Neither wanted to deal with it, and the topic of more efficient packaging sat on the table like a dead fish."

Part of the solution, White argues, is the creation of a group of new professionals who can seamlessly cross over between the logistics and packaging divisions to reconcile their individual interests and find the best solutions for both. This position could bring together visibility of the impact of packaging throughout the supply chain.

"Marketing folks have desires for look and feel, and supply chain people have the facts on damage rates, how much will fit on a trailer, and how much they can move in a given amount of time," says Darren Jorgenson, practice leader of the packaging optimization practice at Chainalytics. "Working on those sorts of interplays is key, but far from easy. You might readily identify that 1/8 inch off a product creates two more layers in a trailer. That small change sounds nice, but that's a big project."

A solid, but not rigid, foundation

One way to reduce the scale of such a project is to involve all stakeholders early. Bob Petersen, vice president of product management for Orbis, says it's a lesson some have learned the hard way but often don't repeat. "Customers on their third or fourth automated storage and retrieval system, for instance, are definitely bringing in a couple different packaging people earlier in that process," he says. "Maybe it's still not early enough, but it's earlier than their first. It's typically not until much later in the process that they are thinking about the pallet footprint in that system."

Petersen says he often hears from companies bumping up against the limitations of their packaging and finally feeling enough pain to call a doctor. "They usually have a very specific challenge they're looking to solve," he says. "The solutions will have an impact throughout the supply chain, but they might be so in the weeds on that small project that it's important to help them get as many supply chain players involved as they can, since small tweaks here and there can really add up."

A new tier of professionals could bridge the gap between the interests of personnel in packaging, operations and logistics.

Adjustments to racks or conveyors at the manufacturing site can have a huge impact on logistics, but few operations are keen to make a habit of such changes. This is why it's essential to understand that a few millimeters of pallet width could cost 15% cube utilization in a trailer. Petersen cautions against taking the precision of packaging design too far.

"Keep in mind how often primary packaging can change given SKU proliferation and rapid business changes," he says. "It might seem like a big savings to take that quarter pound out of a pallet or crate, but you might reduce how many different items can fit in there. Whereas if the crate were heavier and not as item-specific, you'd have the flexibility to adapt going forward."

Petersen suggests a 25% increase in upfront packaging costs—which many customers might immediately dismiss—could ultimately avoid an entire

packaging conversion in the future, the cost of which will certainly dwarf that initial investment.

The phrase "it's just a pallet" is thrown around all the time, Rupert says. At $20 apiece, they aren't often the first concern in a multi-million dollar automated facility. But when you do the math, he says, that building might house $3.5 million per year in pallets.

It's the same story with corrugate packaging, whose design is often divorced from the systems it touches. Strangely, in this case, Rupert says many clients will actually default to spending more in an effort to minimize failures.

"If a client sees damage and uses corrugate, they will immediately go to more packaging," he says. If they instead looked at how they handle those cartons elsewhere in the facility, they could actually reduce packaging and solve the problem at the root cause.

"That's the part that's usually overlooked. A carton-friendly, 100-foot conveyor system could cost me $50,000. But if I can cut 20 cents on every package, I can pay for it in a few months," Rupert adds. "This is challenging if the person buying corrugated or the packaging engineer doesn't have the leverage to tell operations how to change their system."

Ampuja emphasizes the benefits of also collaborating upstream. Packaging improvements tend to start with the supplier, he says. "Don't get hung up on one stakeholder appearing to get more savings, since those will be passed along," he says. "Others worry that they are just one of 10 retailers who buy from a certain manufacturer, and probably can't get them to make a change to suit just them. The manufacturer says everyone else is happy, so why rock the boat?"

It is still possible to make the case to a manufacturer that a change is possible and mutually beneficial. Ampuja says a given rectangular retail unit, if packaged 12 to a box, offers 325 potential configurations of that box and its positioning on a pallet. "If a company finds one that works, they will usually never question it," he says. "But what money did you leave on the table by not going with a more optimal solution?"

A given product could be configured in hundreds of different ways in its primary, secondary and tertiary packaging, but specifications for the latter rarely change.

Making an impact

Starting at the beginning is important, but Jorgenson says those decisions must still consider impacts all the way down the supply chain. Take a product like a lawnmower, for example. If partially assembled, it will fit in much smaller packaging and more units will fit in a trailer, Jorgenson says. But this will place the burden of assembly on a dealer, retailer or consumer.

"It's critical to design packaging for all the environments it will experience through the supply chain," he says, "and that includes measures of labor and customer sentiment in addition to mechanical forces."

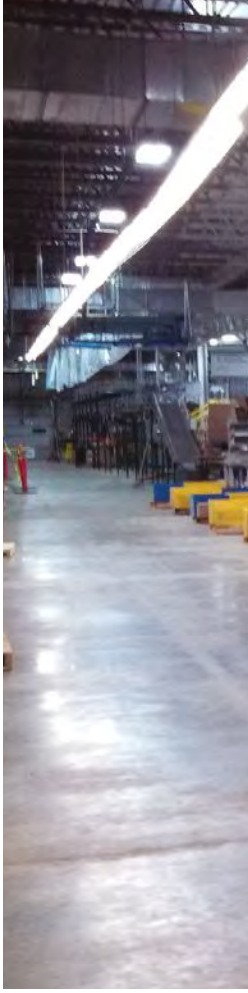
In the case of the chemical, food and pharmaceutical industries, close tracking of conditions at each step is either mandated or an important competitive factor. Peter Schmidt, head of sales, palletizing and packaging for Beumer Group, says these applications illustrate the near future of packaging disciplines.

"In a smart factory, what some call Industry 4.0, smart products can be in constant communication with the production facilities," Schmidt says. "The connection of people, objects and systems creates dynamic, self-organizing networks that increasingly connect production and logistics to an Internet of Things. A data network from the supplier to the manufacturer to the retailer to the customer becomes essential. Providing reliable and fast data helps improve packaging efficiencies and optimize packaging processes."

White offers cautionary advice to those who have already begun capturing valuable data, creating new positions and breaking down silos to create a systems-based approach to packaging design. "What happens is the new, optimal design gets cast in stone. It doesn't change, doesn't evolve," White warns. "People who implement these changes have to be continuously working to improve, and specifications should continuously evolve. Once you fix a component in stone, you're right back to component-based design." ☐

Companies mentioned in this article

- Beumer Group
- Chainalytics
- Millwood
- Orbis Corp.
- Supply Chain Optimizers
- White & Co.



4 WAYS packing stations have evolved

Moving from an afterthought to a key component of e-commerce and omni-channel facilities, today's packing stations are unclogging bottlenecks and improving order fulfillment productivity.

Particularly for back-of-store areas, the placement of every piece of packing support equipment—including scanner, keyboard, printer, tape, label stock and more—must be carefully considered to promote productivity and eliminate wasted space.

By Sara Pearson Specter, Editor at Large

Behold the packing station, an aspect of the fulfillment process that historically hasn't gotten a whole lot of consideration or respect. Distribution centers that once thought a couple of 8- to 10-foot-long folding tables were up to the job of packaging picked orders for shipping have now re-evaluated the importance of these areas. This is especially true for operations focused on high-volume, small parcel e-commerce and omni-channel order fulfillment—where poor packing station design is most likely to cause a bottleneck in the outbound shipping process.

"Packing stations used to be an afterthought," says Mike Kirby, director of corporate sales and marketing for BostonTec. "But now we're being brought in by materials handling integrators far earlier in the design process to ensure that these workstations are properly integrated into the facility and its flow plan."

No longer are DCs just setting up a few tables between picking and shipping zones, he adds, but

To accommodate different height operators, the latest packing stations include electric-powered height adjustments with programmable pre-sets. This allows an operator to adjust the station, so all necessary items are in easy reach.

rather examining their entire flow process at a much more granular level. That's because increasing competition in the e-tail marketplace has ratcheted up the pressure for same-day order fulfillment.

With that new emphasis on maximizing throughput, packing stations have evolved. Here, *Modern* takes a look at four of the newest productivity-boosting features and configurations offered on today's packing stations.

1 Customizable features improve ergonomics, organization

Most packing station manufacturers have developed a broad range of modular components that can be assembled in a variety of ways to organize packaging supplies and equipment. By conducting a thorough analysis of the current (or planned) packing processes, suppliers like BostonTec can help an operation achieve a balance between efficiency and ergonomics—since a physically comfortable worker is also a more productive one, explains Kirby.

"The most forward-thinking companies are looking to not only eliminate stressful, repetitive motion injuries, but also to increase productivity and efficiency through a design that requires less overall movement within the work cell," he says. In fact, operations are taking that concept even further, requesting different packing station configurations that match different functions within the same facility.

"All of the jobs aren't the same, so why should all the workstations look the same?" asks Kirby, noting that some stations might be designated and stocked for packaging small items and others for large items.

To accommodate different height operators in multi-shift operations, the latest packing station models include electric-powered height adjustments with programmable pre-sets for different workers. This feature allows an operator to effortlessly adjust the station so all necessary items (such as bar code scanner, keyboard, touchscreen or tablet computer, boxes, collateral material, polybags, labels, tape and more) are easy to reach regardless of the worker's stature.

A packing station should also be configured to limit footsteps, says Kirby, recalling a DC that used a 6-foot-long table for packaging because they had a large desktop printer located at the end of it. The operator walked several feet from the work surface to retrieve the labels coming out of the printer.

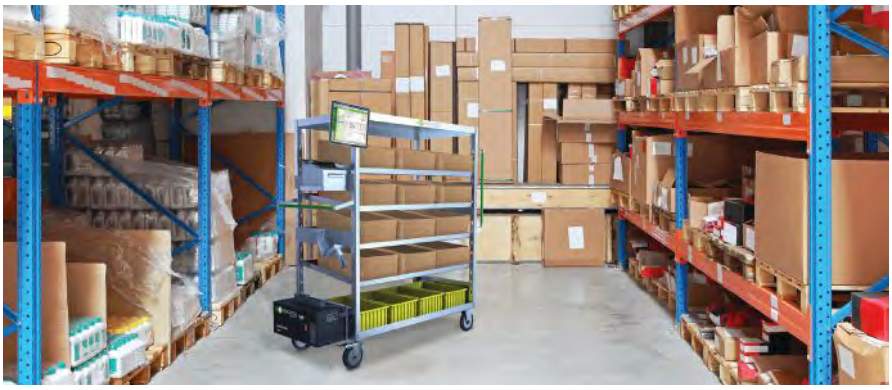
"We designed a sliding shelf mounted to the floor underneath the packing station to position the printer at hip level, yet make it easy to slide out for accessibility in loading paper or toner," he says. "Having the labels right there saved five to six steps per package, which could save as much as 10 to 15 seconds."

2 Automation increases accuracy, speed

For even higher throughput gains, packing stations can be equipped with varying levels of automation to enhance operator productivity when integrated with a warehouse management system (WMS) and warehouse control system (WCS), says Mike Clemens, senior consultant at Bastian Solutions.

The WMS and WCS can pre-cube orders that fit in a certain size or type of carton, or can batch orders with identical line items together, he explains. This advanced user interface can display carton size and placement instructions and embedded labor reporting. It can also provide real-time feedback, such as engineered standards and an item pick image display.

"When the picker delivers the items to a packing station, they can be quickly sorted. That sorting might be supported with a wide flat-screen monitor with pictures of each item and work instructions about which item goes in which box," Clemens says. "Alternately, a light beam might be employed to illuminate the source bin of the picked item or the destination carton."



Mobile pack stations allow for picking and packing on the go to eliminate bottlenecks at stationary packing stations. Operators can pack up to 40% more product on carts than at fixed stations.

Likewise, pick-to-light modules at a packing station can be used either to organize outbound order cartons for picked item distribution, or for picking of select collateral items—such as packing lists, catalogs, literature, coupons or other special offers—required by certain parcels.

Full automation is even an option for packaging as much as 80% to 90% of a high-volume shipper's orders, says John Panunto, president of PSI Engineering, which recently released the Rapid Flow automated pack station. The system integrates software, conveyors and related in-line equipment (including a checkweigher to validate that the correct item is paired to the order). "Adding product cubing data allows the system to determine the correct packaging carton size or polybag to help reduce shipping costs," he explains.

Synchronized to print and insert or apply packing slips, shipping labels and marketing collateral at high speeds, Panunto says the system is also equipped to print customized messaging on-demand.

"The e-commerce space is so competitive, retailers are trying to draw repeat purchases with special offers," he says. "But without automation, it adds time to the process to verify that the right customer gets the right offer—and for DCs trying to get an order shipped the same day, doing that manually takes too much time."

The system can process up to 25 cartons per minute and minimizes errors to 99.99% accuracy, he says.

For a high-volume operation, fully automated packing stations—integrating software, conveyors and related in-line equipment, such as a checkweigher to validate that the correct item is paired to the order—are an option for packaging up to 90% of orders.

3 Mobility enables simultaneous picking, packing

Another way to further cut time from the packing process is by adding mobility to a packing station. Constructed of lightweight aluminum, mobile pick/pack carts ride atop wheels and can house battery-powered wire-

less computing, scanning, printing and light-directed picking modules.

"A DC might set up a picking zone ranging from 5,000 to 15,000 square feet for their fastest moving items, then send pickers with a mobile pick/pack cart out to fill orders as directed by a tablet or laptop," says Kevin Ledversis, sales director at Newcastle Systems. "Instead of picking into reusable totes, the cart is instead pre-staged with shipping cartons, so the required items are picked directly into the box."

The on-board printer generates the associated label, which the picker affixes to the appropriate order. Upon completion of all picks, the cart is wheeled to shipping where a waiting associate seals the boxes and routes them to the designated carrier. Within that same area, additional pick/pack carts might already be staged, allowing the picker to grab the next cart and repeat the process.

To boost throughput, packing stations can be integrated with a WMS and WCS to pre-cube orders that fit in a certain size or type of carton, or batch orders with identical line items together. When the picker delivers the items to a packing station, sorting is supported with a monitor displaying pictures of each item or work instructions about which item goes in which box.

"Having the ability to pick and pack on the go eliminates bottlenecks at stationary packing stations because it's simply not possible to pack items as fast as they are picked," continues Ledversis. "With the mobile packing station, we've found pickers can pack anywhere from 25% to 40% more product than at fixed stations. With roughly half the labor cost in a warehouse dedicated to picking, this can positively impact the bottom line."

That's not to say that fixed packing stations don't have their place. "Depending on the variety and size of items handled in a facility, you probably can't eliminate all of your traditional packing stations. The carts are ideal for smaller items; you still need an area to package larger items," he says.

4 Omni-channel fulfillment support at store level

With the growth of omni-channel retail fulfillment, stores are being leveraged to support e-commerce orders—meaning they also need a dedicated order packing area. Thanks to the square footage limitations of most retailers' backrooms, however, effective packing station design has become essential, says Jeff Dehnert, president of Dehnco Equipment & Supply Co.

"When omni-channel first started, retailers thought they could just stick a table in the back and it would be fine, but they aren't getting the throughput they're looking for—particularly at peak times," he explains. "Like packing stations in the DC, proper design requires a good understanding of how things move in and out of the area, as well as of the step-by-step process of movements and touches required to fill an order."

The placement of every piece of packing support equipment, including scanner, keyboard, printer, tape, label stock and more, must be carefully considered. Not only for accessibility to promote productivity, but also to eliminate wasted space, he says.

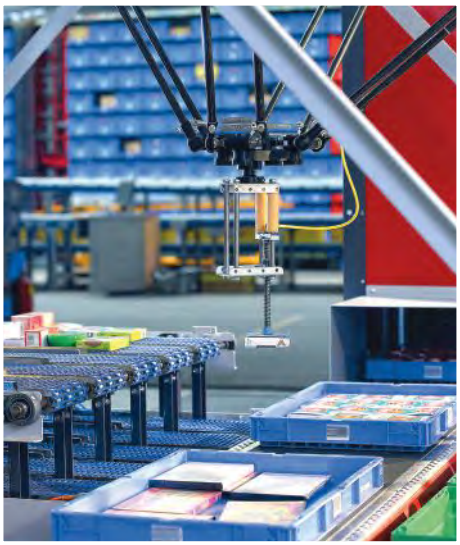
As stores expand the number of items available for shipment, the number and variety of packing supplies expands as well. "Eventually the stores have to stock the same selection of carton sizes as the warehouse, but in much less space. That's led to more sophisticated, modular packing station designs that use every vertical inch and components that allow for easy modification to adapt to changing supply inventory," Dehnert explains.

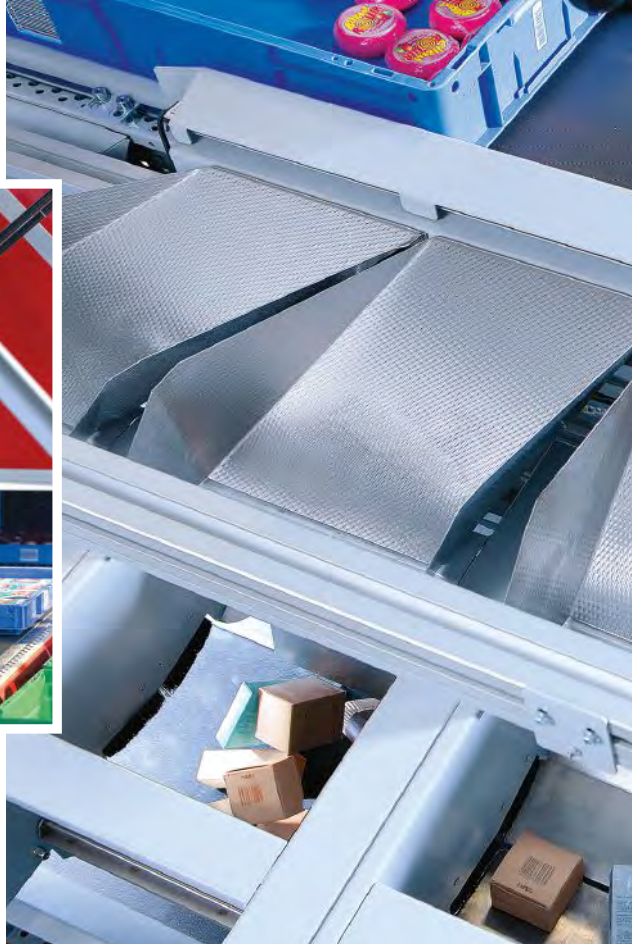
Take polybags, for example, he says. Just as DCs are increasingly using polybags for parcel shipping in response to dimensional (DIM) weight carrier charges, so too have stores.

"Historically, polybags were stored in a box that sat horizontally on a shelf," Dehnert says. "Now, they come wicketed, meaning a stack of the bags bound together at the top with holes that allow them to be suspended vertically, and perforations so they tear off the stack. They way they are presented, they can be filled and removed simultaneously, saving both time and utilizing the space better." □

Companies mentioned in this article

- Bastian Solutions
- BostonTec
- Dehnco Equipment & Supply Co.
- Newcastle Systems
- PSI Engineering





TRAINING robotic pickers *to do their piece*

By Josh Bond, Senior Editor

Amid rapid advances and adoption of robotic technology in materials handling, it can be hard to keep up with all the tipping points. Grippers, vision systems, navigation solutions and software are combining to make once fantastical robotic applications all but inevitable. But, even as they offer solutions to age-old challenges, concepts like robotic piece picking are also bound to present sizable tests.

When it comes to piece picking, humans have the advantage of highly dexterous manipulation, versatile product identification and intuitive decision-making. Robots offer consistency and predictability, but they will need greater speed and flexibility to keep up with the inconsistent and unpredictable world of e-commerce fulfillment.

Researchers, solution providers and end-users are still in the very early stages of identifying the opportunities, developing highly customized solutions and quantifying the results. However, because the optimal piece-picking robotic system will depend on efficient and connected processes,

Whether mobile, stationary or collaborative, piece-picking robotic solutions are gradually learning the ropes in warehousing and distribution.

many operations will build comfortable homes for robots long before they are ready to move in.

"In the past, there were attempts to simply replace a person with a robot, which rarely works," says Manfred Preiss, vice president of global sales for Schaefer Systems International (SSI). "There has to be the right environment surrounding the robot, and we have many of the pieces today. It's now a matter of putting those pieces together in the best way."

The pick, not the litter

Preiss says the cost and performance of robots, sensors and other components continue to get better, but the state of the labor market has become an even more powerful driver for many companies considering robotic alternatives. It's not just the cost of labor, he says, but the availability. Combined with the order profiles common to e-commerce, it's a recipe for increased costs and errors.

"In e-commerce you might see 35% to 55% single-line orders, which is a lot of work when you do it manually," he says. "If you want the highest quality picking with the cheapest people, it just doesn't go together."

Similarly, robotic piece-picking solutions are rarely a direct substitute for humans in conventional picking areas. Instead, Earl Wohlrab, palletizing and robotics systems product manager for Intelligrated, says robots will make gradual gains in these environments by targeting specific elements of the picking process.

"I see robots offering value by providing mobility in the spaces between tasks," Wohlrab says. "This will enhance the amount of tasks a picker can do within a work zone, where he or she might work alongside a mobile, collaborative robot."

For operations that cannot justify a robotic goods-to-person solution or automated storage and retrieval system (AS/RS), this kind of mobile robot could sup-

Mobile piece-picking robots won't necessarily require changes to a facility's infrastructure.

port picking, replenishment and packing without requiring major adjustments to existing processes or infrastructure. That said, Wohlrab encourages customers to consider wider changes as they pursue robotic picking solutions.

"If you simply want to inject automation into a process, as opposed to thinking about new ways to do the same thing, you're missing an opportunity," Wohlrab says. "The folks who embrace things like wireless networks and connected systems will have an easier time because they will be able to more broadly integrate the operation from receiving to shipping, as opposed to those who continuously compartmentalize and only pursue solutions that make each of those processes better."

For example, even as vision systems become more capable, robots benefit greatly from consistent labeling. Wohlrab says too many companies rely on lots of manual labor at receiving to ensure accurate labeling for automation throughout the rest of a facility. When a human takes something off the back of a truck, there's a good chance they can tell the difference between grapes and cherries, he says. Once manually identified, items can move more seamlessly through automated systems.

"But is that the best time to apply a label, relying on a guy with a stack of boxes on the back of a truck, or would you rather label at the manufacturer when they are producing 150,000 units at a time?" Wohlrab asks. A conversation with the manufacturer might enable accurate and speedy materials handling as soon as product arrives at the facility. In the meantime, there are several touch points for a human to identify, verify and move. More often than not, Wohlrab says, those manual activities keep getting handed downstream.

"A lot of folks have been focused on shipping efficiencies, but because of the nature of receiving there are four or five times as many people there," he says. "Shipping is a lot less stratified operationally, so moving forward, receiving is where we'll have to be smart and sharpen our pencils. Automation has always been a desire, but it's moving toward a necessity."

Burgeoning goods-to-person technologies might also show up in goods-to-robot solutions.

Fixing the path

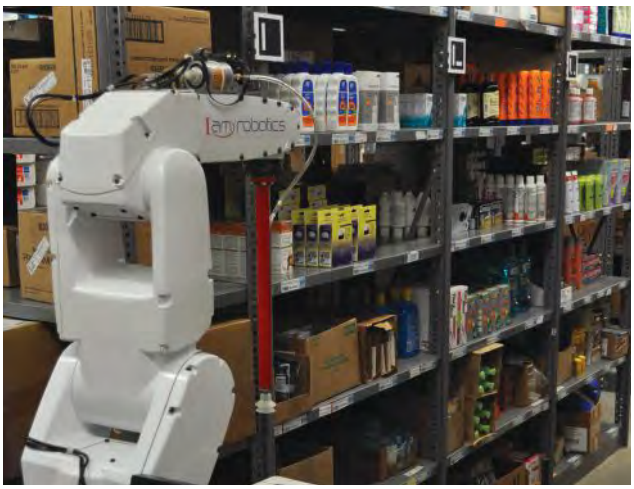
From receiving, mobile robots offer several new takes on the movement of goods to storage and pick areas, from pick areas to packing stations, and from there to shipping. While it is clear that a robot is better suited to transporting materials and a human is best kept picking as much as possible, it's not as clear, however, precisely how those functions should be divvied up.

If eaches are manually or automatically de-trashed at receiving and placed in a bin, an automatic guided vehicle (AGV) might ferry them to a pick location, or straight to packout. A robotic picking system might both pick and pack. People and robots might occupy the same aisle, collaborate on the same order, or specialize in the handling of certain SKU or order profiles. Of all the possible paths, experts agree that there are a few configurations that seem promising.

Many people are familiar with goods-to-person systems, including high-density AS/RS and shuttle systems, autonomous carts, or conveyor and sortation systems. Preiss sees opportunities for goods-to-robot systems, which capitalize on the established performance of goods-to-person solutions and stationary robots.

Preiss describes one customer's system of piece-picking robots stationed at a pocket sorter. Surprisingly, the robots are fed by manual processes in this case, but whatever the upstream mechanism for presenting goods to the robot, it can handle the retrieval and depositing of as much as 90% of the customer's SKUs.

"Many customers also want to reserve the right to manually put to the pocket sorter for that remaining 10% and to consolidate multi-line orders," Preiss says. "The customer's previous system was designed to pick for retail, and they were adding e-commerce capabilities. They went from 1,500 orders to 15,000, but were still handling essentially the same number of pieces. They now have a 15-minute order turnaround."

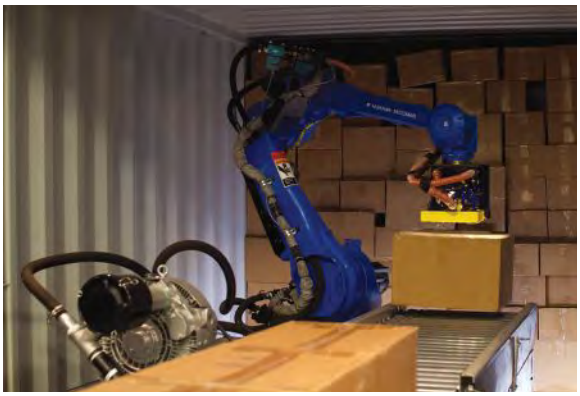


For a piece-picking robot to safely operate alongside humans, there are limits to its strength and capacity.

Integrating a piece-picking robot with a mobile platform introduces a number of additional considerations. Mike Oitzman, product line manager for mobile robots at Adept Technology, says the questions center on the need for the robotic base to support not just a robotic arm but the storage of products picked. This might look like a traditional pallet jack, a cart system or perhaps a mother/daughter system that allows an empty set of orders to dock with a robot—immediately after a full cart decouples and transports itself to packout.

One of the key constraints, Oitzman says, is the requirement for onboard processing and power. Even more critical is that safety concerns limit the weight a robotic arm can handle. Oitzman says the current sweet spot is around the 100 kg mark, but a push is underway to extend that to 130 kg.

"You could make the broad assumption that people are generally not willing to retrofit existing warehouses," Oitzman says. "Therefore you have to make sure that any mobile robotic system can safely work around existing employees."



The relatively straightforward process of robotic trailer unloading offers lessons for piece-picking solutions in the aisles.

Taking control

Aside from nimble grippers and sophisticated vision systems, mobile robotic pickers will also demand robust information technology and control systems. Alfredo Valadez, vice president of business development for Wynright robotics division, says most current warehouse management systems (WMS) and warehouse control systems (WCS) are not intended to handle some of the specific parameters a mobile robot needs.

"For example, they don't now have traffic control capabilities, because they don't need them," he says. "It will be complicated, because as those sequences are happening for each robot, you might have hundreds of those instances happening at the same

time. Hardware is one thing, controlling it is an entirely different issue."

Tom Galluzzo, founder and CEO of IAM Robotics, agrees, and says it's difficult to get a robot to do anything more than a single-step task without exponentially increasing complexity. Fail at any one step, he says, and the whole process fails.

"Even if the robot can do each step with 99.9% accuracy, multiply all the steps together and you might end up with a 50% chance of success," Galluzzo says. "A mobile piece-picking robot needs to be able to pick not only from a flat shelf, but from a flow rack, pallets and other configurations you find in a warehouse."

Galluzzo says his company's experience in mobile picking started with the idea of a robot facing the shelves of a retail environment, specifically as a stocker in a pharmacy. In this type of application, an arm picking from a static shelf can pick 100 items per hour, provided they are small, rigid items like boxes and bottles. In a warehouse, Galluzzo says slotting will be a high priority, and might create zones of SKUs he calls "robot-friendlies."

"That is not to say the robot will work in a separate zone," he says. "More often than not, automation and manual laborers will work together in the same area. You don't want to take that off the table since it's still a good way to handle peak times, with both human and robotic assets able to access the same SKUs."

That flexibility will allow the manager at the controls to assess people, robots and assets and redeploy as needed. Galluzzo envisions a gestural interface that could allow the manager to drag and drop a robot to address expedited orders or exceptions. Robots can't always resolve exceptions as aptly as a person, but the control and order management systems will not care about the difference between the two.

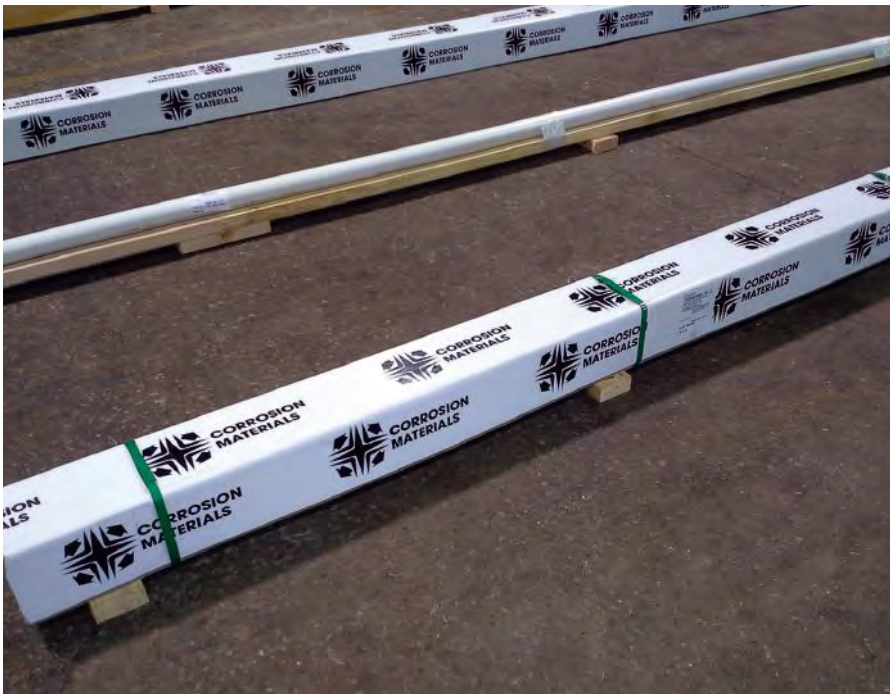
"As robots get better at handling a wider array of SKUs, rigid but not regular products will be the next horizon," Galluzzo says. "It will be some time, and 95% of the major breakthroughs in this space will come from the software side." □

Companies mentioned in this article

- Adept Technology
- IAM Robotics
- Intelligrated
- Schaefer Systems International (SSI)
- Wynright Corp.

By **Josh Bond**,
Senior Editor

Distributor prevents packaging from eating away at the bottom line



New paperboard packaging cuts labor costs and eliminates product damage for long and narrow products.

Corrosion Materials, with headquarters in Baker, La., and additional warehouse facilities in Houston and Chicago, distributes corrosion-resistant alloys that are fabricated into products for industries such as petrochemical, chemical process, oil field, pharmaceutical and desalinization operations. After switching to a recyclable paperboard packaging solution, the company saved money when shipping long and narrow products.

The company's previous approach to shipping its specialized alloys, pipes and round bars was very labor intensive. Employees used power tools and saws to prepare PVC cylinders and wooden crates to package product. Corrosion Materials ships globally from all three of its locations and uses all modes of transportation, from container ships to planes, to common carrier and dedicated carrier trucks. Some of the alloys are particularly sensitive to scratching and/or denting, so protective packaging is critical to customer satisfaction.

"When products are exposed to corrosive agents, they will typically attack those areas where there is scratching or a ding," says Rob Hanks, operations manager for Corrosion Materials. "We tried some samples of the new paperboard packaging and fine-tuned the specifications a bit, and we have been using it for going on two years now."

The new packaging (Laminations, laminationsonline.com) consists of seamless U-shaped paperboard channels that fit snugly together to ship long, narrow products. Hanks says the solution has reduced packaging costs and is easier to handle and discard on the customer's end because it's 100% recyclable.

"It's easier and quicker for us to fabricate our packaging since it's pretty much pre-made," he says. "We now use it to ship most of our products from all three locations, and we have had zero issues with product damage." □

By **Josh Bond**,
Senior Editor

Bins and shelving system saves valuable minutes

Hospital system reorganizes medical supply room to improve patient care through new supply chain practices.

The University of Chicago Medicine recently launched an initiative to improve the academic medical center's supply chain practices. A new Kanban system includes shelving and rail-mounted bins that reduced excess stock, stock-outs and misplaced items.

After the center's supply chain team assessed the daily process of staff members locating the correct medical supplies, they recognized that one of the system's greatest challenges was the ability to get back to the patient as quickly as possible. With nearly 150 storage rooms throughout the medical campus, team members worked to standardize room layout and ensure product organization and accurate labeling. Before the project, it was common to find multiple types of items in bins, items hanging from carts, and items placed haphazardly on the top of shelving units.

"Bins with dividers worked great for our process until we were challenged with the rotation of extremely high-volume items in the emergency department's supply room. It just wasn't practical for this area," says Julie Aggen, senior process transformation specialist at the medical center. "The rail hanging system was the answer to that challenge."

The new storage system (Akro-Mils, akro-mils.com) included high-density storage areas, clear bins for item visibility, gravity hoppers for first-in, first-out item lot rotation, rail hanging and shelving systems. Rather than moving large amounts of product from one bin to another, associates slide empty bins off the rail, push over the bins still containing product, and slide the empty ones back on the rail for restock. This eliminates the need to lift heavy bins full of product or transfer product from bin to bin.

"One of the benefits of implementing a Kanban stock replenishment system is having a built-in stock rotation function," Aggen explains. "We've reduced waste by removing unneeded products from supply areas. Overstock returned from supply areas has totaled $37,000, and clinicians identified hundreds of items in the supply areas that were no longer needed."

In addition, the team deployed RFID technology to manage the reorder process, a just-in-time replenishment system, and color-coded Kanban cards that fit in the card holder on the front of the bin. Aggen says the supply area reorganization led to a noticeable increase in open floor space and an easy-to-maintain storage environment. ☐

By **Josh Bond**,
Senior Editor

Nuclear power plant energizes parts storage

Vertical lift modules ensure accurate and secure access to thousands of critical maintenance parts.

The Susquehanna nuclear power plant, a Talen Energy facility located near Berwick, Pa., is one of the largest nuclear power plants in the United States, with a capacity of more than 2,600 megawatts. Using a series of vertical lift modules (VLMs), the facility was able to improve the accuracy and security of small parts inventory.

"At Susquehanna, every decision we make is safety driven," said Tom McAvoy, logistic services supervisor responsible for warehouse operations at the Susquehanna plant. "Maintaining on-site inventory of parts and tools required for equipment maintenance is a top priority."

The 56,000-square-foot main warehouse on site currently has more than 58,000 active SKUs needed for mandatory preventative maintenance work and scheduled shutdown maintenance in inventory. With inventory expanding yearly and the main warehouse nearing capacity, Susquehanna replaced approximately 5,000 square feet of shelving with eight VLMs (Kardex Remstar, kardexremstar.com), freeing up roughly 4,100 square feet of floor space.

A ninth VLM stores gasket materials, which were previously subject to dirt and deformity. The enclosed environment of the VLM ensures clean and usable gaskets while providing employees easy ergonomic access. A 10th climate-controlled VLM was added to store circuit cards and circuit boards in accordance with standards. "A temperature- and humidity-controlled environment is a good solution for our storage of circuit cards and circuit boards," says McAvoy.

The enterprise resource planning (ERP) software selects a random number of parts to cycle count per day based on an inventory cycle-count requirement. The VLMs also provide a higher level of secured access, allowing only warehouse employees access to the machines. McAvoy says cycle counting combined with the secured storage environment has resulted in inventory accuracy greater than 99%.

Refueling a nuclear reactor also requires Susquehanna to schedule a complete shutdown every two years. This scheduled shutdown requires about 1,200 additional contracted workers to perform hundreds of maintenance tasks, requiring access to 6,000 to 8,000 parts.

"Organized, accessible and accurate parts inventory is critical in our industry," McAvoy says. "The VLMs have supported our ability to create a reliable parts management system." □

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The state of the **retail supply chain**

The ability to ship anything from anywhere—to anywhere—within a short timeframe isn't the only trend that's shaping the retail supply chain. *Modern* explores the key trends taking place in 2015 (and beyond).

By Bridget McCrea, Contributing Editor

Rewind about two years and Brian J. Gibson remembers attending a retail conference in Reno, Nev., where he talked to a panel of executives about their top challenges and issues. When the Wilson Family Professor of Supply Chain Management at Auburn University posed the questions, "How do you fulfill customers' online orders and, do you look at transportation costs and fulfillment costs and then offer them choices?" he was taken aback by the responses.

"They basically said, 'It's whatever the customers want. If they want to pick it up in the store, then they pick it up in the store. If they want it delivered to their house, we'll deliver it to their house,'" Gibson recalls. "There was literally no focus on the cost aspect of it, or on what the most efficient or optimal approach would be."

Today's retailers are decidedly more focused on the fine points of the "anytime, anywhere" approach to fulfillment, and with good reason. The exploding omni-channel trend, the demanding consumer who wants everything yesterday, and the evolving regulatory market are all forcing


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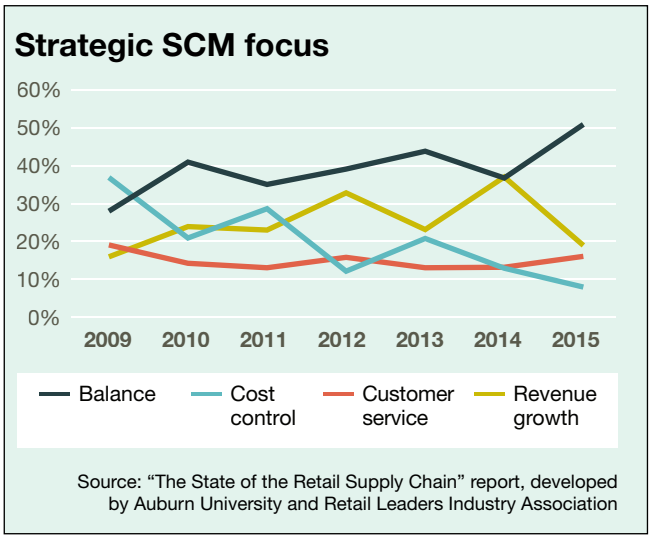
companies to look harder not only at how goods are being shipped, but also on why certain methods are used and what they could be doing better in this regard.

"We're seeing a much greater focus on understanding and managing fulfillment costs and an attempt to shape customers' actions, decisions and activities based on the best possible solutions," says Gibson. "Retailers look not only at what's viable, they also want the options that are lowest in cost while meeting customers' requirements."



Source: "The State of the Retail Supply Chain" report, developed by Auburn University and Retail Leaders Industry Association

And while Gibson clearly sees more rationality around omni-channel fulfillment than there was just two or three years ago, the ability to ship anything from anywhere and to anywhere within a short timeframe isn't the only trend that's shaping the retail supply chain right now. At his recent SDI Logistics Forum presentation entitled "Retail Fulfillment: Doing More with Less," Gibson highlighted the results of his fifth-annual "State of the Retail Supply Chain (SRSC)" report.

Trend spotting

In the report, Gibson outlines seven key supply chain trends or "lessons" that retailers are grappling with right now (see box on p. 58 for a synopsis of each trend).

"I focused on some of the key issues that we've seen over the last few years in our annual retail study, plus the 2015 version of the study," says Gibson, who typically interviews retail supply chain executives from 25 to 30 companies (plus another 50 who answer the survey) and then uses the information gathered to develop the report. "We hit a lot of the top 100 U.S. retailers and get the perspectives of the big industry players; a lot of the trends and issues we uncover eventually [impact] the smaller retailers as well."

During his research, which took place during the fall of 2014, Gibson heard a lot of complaints about the port strike that was in full swing at the time. "That was obviously one of the most important themes," he notes, "but certainly other transportation issues came up as well." Carrier capacity, for example, was top of mind for survey respondents who were concerned about their firms' ability to secure capacity in 2015 and beyond. Two other big areas of concern were materials handling and omni-channel fulfillment trends.

In the materials handling arena, Gibson says one of the biggest changes that's occurred over the last few years is the significant shift in attitudes and actions regarding the use of warehouse automation. Two years ago, for example, companies were having a hard time justifying the capital investments associated with such purchases and often griped that the ROI "didn't meet the thresholds for their companies," says Gibson. "Now, two years later, everyone is either investigating the use of automation or already in the mindset of using it. That's a 180-degree turn since 2013."

Driving that warehouse automation trend, says Gibson, are factors such as rising labor costs, availability of labor, and the speed and flexibility with which individual orders need to be picked, packed and shipped. "Even grocery retailers are fulfilling at the individual level—a shift that's pushing almost 100% automation of warehouse operations," he explains. "That's pretty interesting."

What's old is new again

All of the warehouse automation and omni-channel fulfillment capabilities in the world can't cover up a poor transportation network or warehouse operations. This basic fact was revealed in the report. "If you don't have the fundamental distribution issues covered, the innovative technologies and solutions can't help you," says Gibson. "You have to be able to manage the basics of freight movement, capacity, inventory accuracy, and labor productivity very closely and very well. You can't jump ahead or forget about the basics as you move forward."

Gibson sees labor issues as a particularly onerous for retailers trying to develop and leverage effective, omni-channel-centric supply chains. "These issues aren't going away anytime soon," he adds. "As the economy continues to improve, people are going to want to work in manufacturing versus fulfillment, logistics and transportation." To offset this obstacle, companies will have to come up with innovative and creative ways to fill positions, retain key employees and develop effective succession plans. The latter is particularly relevant in today's workforce, where a high percentage of the nation's 78 million Baby Boomers are already heading into retirement.

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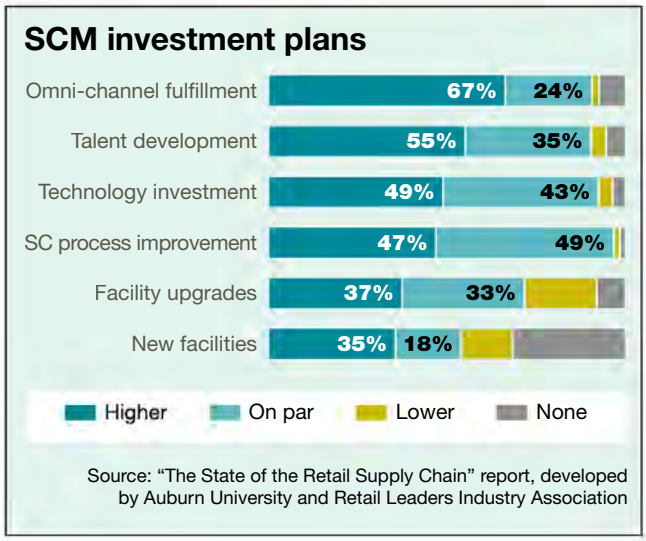
Gibson. "Where are the up-and-comers? A lot of schools are working to develop this talent, but we're definitely seeing a void of high-caliber talent in the middle management group (aged 30 to 40+) right now. That's definitely a concern for retailers who need those sharp people to run their supply chains."

Calling the 2014 retail landscape "bipolar," with U.S. retail sales up 3.8% for the year, paced by a 15.4% gain in e-commerce sales over the previous year, Gibson says the latter captured the focus of retail supply chain management professionals as they worked diligently to create seamless omni-channel processes. "Despite the periodic challenges created by port issues, transportation capacity and labor shortages, and other disruptors," says Gibson, "retail supply chain executives are moving forward with essential investments, infrastructure modifications and service improvements."



Source: "The State of the Retail Supply Chain" report, developed by Auburn University and Retail Leaders Industry Association

RFID rebirth

As 2015 slowly sets and 2016 comes into focus on the horizon, more changes could be in order for the retail supply chain. For example, Gibson sees a rebirth currently taking place on the radio frequency identification (RFID) side of things—a movement that "died on the vine" a few years ago due to the high cost of RFID tags and other issues.

"Over the last six months we've heard more companies talking about how they need RFID for inventory accuracy," says Gibson, "knowing that if they commit to having units in a store for a customer, they'll have to fill that order for pickup. When the customer gets there, the retailer had better be able to find that product and quickly."

Calling RFID a "new link in capability," not just to support inventory accuracy, but also to support omni-channel fulfillment at the store level, Gibson says the technology—which is already being used by large retailers like Target and Macy's—helps retailers stick to their customer commitments. "It's helping them retain and grow sales." □

7 key retail fulfillment lessons for 2015

Here are seven areas that Auburn's Brian Gibson advises retailers to keep a close eye on:

1. Inventory: Customers want buy-from-anywhere flexibility and an endless aisle of products. Retailers desire single inventory pool to control investment. Key challenges for retailers include system-wide visibility, in-store accuracy levels, technology capabilities and DC integration activities.

2. Labor: The cost of employment and labor turnover issues justify a new model for DC operations. To solve this issue, retailers should analyze ROI for automation opportunities. To achieve this goal, retailers have to be able to justify major investments and integrate omni-channel operations.

3. Time: Customers expect an array of rapid fulfillment options and no-cost delivery. Retailers must match capacity and capabilities to volume and service requirements. To make that happen, retailers must be able to meet true demand for same-day and offer fast vs. free alternatives and store delivery frequency.

4. Space: Creating separate fulfillment facilities for uncertain volume carries significant risk. To overcome these issues, retailers must fully use existing infrastructure capacity to compete. Achieving this goal can be difficult due to the breadth of SKU assortment and volume by channel.

5. Transportation capacity: Carriers are more selective about lanes served and strategic customer relationships. Retailers must be creative and think long-range when developing transportation strategies. The problem is that innovation options are limited and some retailers continue to be plagued by the aftermath of port disruption.

6. Transportation cost certainty: In 2015, we saw the implementation of dimensional (DIM) weight pricing. Retailers have been since assessing the impact of this new parcel pricing strategy. Key challenges include the volume of split ships, store personnel training and packaging options at stores.

7. Margin for error: Fulfillment missteps are very costly and highly publicized events that erode margins and consumer confidence. Retailers must reduce complexity and expense of supply chain operations. To achieve these goals, companies must work through issues like fulfillment and delivery cost control and low customer switching efforts.

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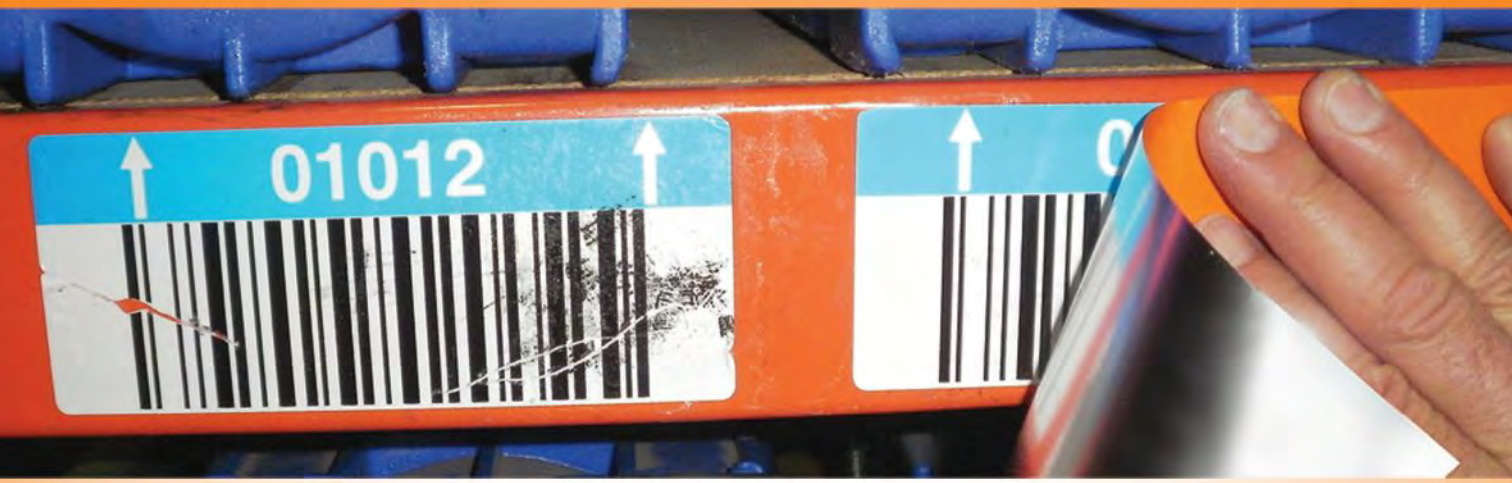

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Low-level palletizer with extended accumulation table

For faster pallet stacking, the Model 72AE low-level palletizer combines the economy and accessibility of a floor-level unit at speeds associated with high-level machines. The unit includes an extended accumulation table that enables continuous layer forming during completed layer transfer and stacking. This increases productivity volume by up to 35 units per minute. Energy-efficient electric motors run quietly, while all layer patterns and pallet configurations are pre-programmed for easy start-up and control. Capable of palletizing cases, bags, trays or totes, the machine automatically changes over on the operator touchscreen panel. For flexibility, the unit's intelligent control allows for new pallet, layer and product configurations to be added or modified by authorized personnel, while all operating parameters can be independently adjusted. **A-B-C Packaging Machine,** 727-937-5144, www.abcpackaging.com. Booth C-2000.

Create right-sized boxes to minimize shipping costs

Engineered for applications requiring small- to medium-sized boxes, the Panotec Compack 1.4 is the smallest model in the supplier's line of automatic box making machines. The scalable, small footprint system features multiple-box outputs, hundreds of pre programmed box styles, and multiple feed inputs. For longevity with minimal maintenance, the system also features high-speed cutting-head technology. By creating the right sized box for every shipment, the machine minimizes shipping costs from excess dimensional weight charges. It also reduces corrugated costs, shipping costs and void fill expenses. **Box on Demand,** 269-964-7181, www.boxondemand.com. Booth S-6337

Robotic integration capabilities showcased

The supplier's robotic integration capabilities will be featured, including system concepting, solutions engineering, manufacturing, installation, commissioning and lifecycle support services. Systems come with integrated software and controls, such as optional programmable logic controller (PLC)-based solutions for easy training and daily use. Custom end-of-arm tooling is designed and built in-house, with flexibility for quick changeovers and compatibility with robotic arms from multiple manufacturers including Motoman, KUKA and FANUC. All robotic systems are tailored to meet the operational requirements of case, pail, bundle, bag, row or layer handling applications. Proactive aftermarket services to reduce downtime and increase system longevity and efficiency are also offered. **Intelligrated,** 866-936-7300, www.intelligrated.com. Booth C-3036.

Robot builds randomly sized cases in end-of-line packaging applications

Co-developed with Motion Controls Robotics, the supplier offers the RCE robotic random case erector system for end-of-line packaging operations. Features include a FANUC M20iA/20 six-axis robot with multiple case magazines and a bottom flap folder with integrated 3M tape head. When incorporated with a vision system, the machine can also assign, verify or track case lot or serialization numbers. Because it eliminates downtime due to changeovers, a well as removing manual, repetitive tasks that can lead to ergonomic issues, the system is ideal for fulfillment centers as well as contract packagers. **Combi Packaging Systems,** 800-521-9072, www.combi.com. Booth C-3245.

Smart conveyors deploy electro-adhesion technology to secure packages

Grabit Electro-Traction smart conveyors use patented electro-adhesion technology to securely move packages at steeper angles and faster speeds for increased throughput capacity and to maximize floor space. Flexible and with low energy requirements, electro-adhesion enables easy handling of delicate and difficult to grasp parts while eliminating custom or costly alternatives. The technology can also be used to slow or stop packages moving down conveyors and chutes, minimizing damage to lighter packages and improving manual package handling safety and efficiency. **Dorner,** 262-367-7600, www.dorner.com. Booth C-1847

Automate in-line inspection

The FA3/M inline detection machine provides automated quality checks, including fat analysis and contaminant detection, of loose meat products. Ideal for processors of mixed bulk meat, the multi-application system can handle various forms of product in different formats such as loose bulk and frozen. When combined with the supplier's SimulTask inspection software, inspection throughput can reach more than 2,400 plastic crates or frozen blocks per hour, or up to 35 tons of bulk meat per hour. **Eagle Product Inspection,** 877-379-1670, www.eaglepi.com. Booth C-3803.

First-in/first-out and last-in/first-out product handling with pallet and carton flow racking

Equipped with slightly declined, non-powered rollers, a line of Dynamic Storage pallet/carton flow racking systems features individual lanes using gravity to move items from the entry point to the unloading position. The rollers are engineered to absorb shocks and incorporate high-performance labyrinth seals to protect the ball bearings from damp and dusty environments. Tested to withstand more than 50,000 cycles in chilled and deep freeze environments, the systems can be set up for first-in/first-out (FIFO) or last-in/first-out (LIFO) handling. To allow the pallet to be unloaded smoothly, a safety separator securely holds the next pallet in line; to slow pallet speed, special rollers with a brake function may be specified. **Interroll,** 678-491-5858, www.interroll.us. Booth S-6174.

Standard and custom-engineered stretch wrappers

A complete line of stretch wrappers is offered in pre-defined standard configurations, modified standard and custom engineered models across five different series to meet a range of applications and throughput requirements. These include high- and low-profile turntable and overhead wrappers; all may be specified as semi-automatic or automatic machines. The machines are supported by a Web site for easy ordering of replacement parts and film, as well as by a 24-hour technical services hotline. **Liberty Technologies,** a Millwood Co., 330-393-4400, www.millwoodinc.com. Booth S-6131.

Move loads up and down multiple levels with spiral conveyors

For multi-tiered product flow, a line of multiple entry and exit conveyors can be added to high-capacity spiral conveyors to allow load induction and divert at several intermediate elevations. Conveyor belts and rollers are individually adjustable to match the spiral pitch, ensuring smooth and reliable operation. Loads can enter or exit the spirals in either up or down rotation. All spirals are made to order and come in four basic configurations that operate up or down in a clockwise or counterclockwise rotation. For space savings, the spirals come in two outside diameter sizes: 7 feet, 3 inches and 7 feet, 11 inches. To accommodate changing application needs, the modularly constructed spirals are field-modifiable. **Ryson,** 757-898-1530, www.ryson.com. Booth S-6102.

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The Sinamics G120 drive system has been enhanced to include EtherNet/IP connectivity for greater communication flexibility in industrial applications, including those requiring a single network for the entire plant—such as large automotive, packaging, plastics, metals, food and beverage and materials handling applications. As standard, the drives support Profibus DP and Profinet to ensure seamless component communications between automated systems, including operator control and visualization and inputs/outputs. Higher-level functions, such as safety integrated telegrams and synchronized mechanisms are also included. The scalable drive features a power range of 0.5 to 350 horsepower and integrated software for convenient start-up. **Siemens Industry,** 800-879-8079, www.usa.siemens.com. Booth S-6137.

Automatic film splicers reduce downtime in packaging operations

The SP1 and SP3HSL automatic film splicers increase efficiency in packaging operations by eliminating downtime caused by manual film roll changes. Featuring a simple mechanical function for trouble-free, automatic splicing, the SP1 senses the diameter of the expiring roll of film and automatically splices the end of each expiring roll onto the new roll. It runs at speeds up to 600 feet per minute. For automatic shrink sleeve splicing, the SP3HSL increases line efficiency by 9%, running at speeds up to 450 feet per minute. **Butler Automatic,** 508-923-0544, www.butlerautomatic.com. Booth C-2838.

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The LevelMaster adjustable leveling caster moves heavy machinery or equipment into place, then provides leveling and stabilizing capability to ensure a sound foundation—particularly on uneven floor surfaces. Each caster handles a maximum load up to 1,000 pounds and is offered in plate- or stem-mounted options. To improve stability when engaged with floor surfaces, the caster also incorporates a shock-absorbing, non-slip, rubber-leveling pad. Hardened steel ball bearings are employed in the load bearing, while secondary thrust bearings surround the swivel raceway on all four sides, to protect the 1-inch king pin from shock for free swiveling under heavy loads. All moving parts are heat treated to extend caster life. **Darnell Rose,** 626-912-1688, www.casters.com. Booth S-5862.

Zipper tape enhances efficiency on vertical form, fill and seal equipment

A new zipper tape can help manufacturers of individual quick frozen (IQF) meat and produce increase line efficiency and productivity while cutting costs. The resealable, press-to-close tape is engineered to accommodate unsupported poly-bag applications on vertical form, fill and seal packaging machinery. For improved barrier protection during shipping, the tape also offers a scored tear-off option. Created with an extruded die-line, the tear-off option better protects products against particles and potential contaminants they may come into contact with along the supply chain. **Presto Products,** 800-265-0750, www.fresh-lock.com, Booth C-2203.

Print full color labels on demand with digital inkjet printer

Printing full CMYK color labels on demand, the SCL-4000D digital inkjet color label printer eliminates the higher costs of short label runs and inventory expenses of stocking different label designs. The printer uses Canon technology in single pass architecture to produce labels on paper or synthetic stocks up to 4 or 8 inches wide. Labels print at speeds up to 7.9 inches per second at a print resolution of up to 1200 dots per inch. Easily controlled through a Windows-based print driver, the unit accommodates direct printing from Photoshop, Paint, Photo Viewer and other label design programs without additional software. Additional utility functions determine ink usage and estimated cost per label. **FOX IV Technologies,** 724-387-3500, www.foxiv.com. Booth S-6101.

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MEK-based, fast-dry ink ideal for consumer packaged goods, pharmaceuticals

MEK-based, a new non-porous, fast-dry ink works with the supplier's VIAjet L-Series thermal ink jet (TIJ) printer. The LS-7001 ink offers 2-second dry time (without dryers), 40-minute open time, and high-quality print on non-porous materials—including plastics, foils, polyfilms and metals. The L-Series ink cartridge, which uses more print nozzles for a high speed, high resolution mark (up to 600 dots per inch) is ideal for consumer packaged goods and pharmaceutical applications where high mark quality at fast production speeds is critical. The printer is controlled by the MPERIA platform for complete management of enterprise marking and coding operations. Also debuting are new red and blue ink colors for corrugated marking with the T-series printer line. **Matthews Marking,** 412-665-2536, www.matthewsmarking.com. Booths C-1831, N-426.

Flexible trayshrink packer ideal for co-packing environments

Engineered as a single machine, the 298 Tritium trayshrink packer flexibly handles tray, pad and unsupported pack styles, making it ideal for co-packer operations. It incorporates the high-speed Robo-Wand wrapping module to handle up to 120 trays per minute while providing a consistent tight, wrinkle-free wrap. With multi-axis control, the wrapping wand creates a variety of packing configurations with minimal part changes. Pack style changeovers are directed through the operator interface screen. To ensure the tray blank magazine doesn't run out, the machine's standard capacity magazine holds 1,500 blanks or can be expanded with an optional 3,000-blank capacity magazine. **Standard-Knapp,** 860-342-1100, www.standard-knapp.com. Booth C-4214.

Filler prevents product contamination with fast capping

Engineered with a smaller footprint, the Level I filler supports a more sanitary environment by reducing the chance of product contamination by immediately capping containers once they are filled. Its positive container control and direct transfer reduce spilling, while easy-to-use machine adjustments and performance monitoring help maximize productivity. Also offered are V-Series seamers that produce consistent, high-quality seams at high rates of speed. **PneumaticScaleAngelus,** 330-923-0491, www.psangelus.com. Booth C-1800.

Automate manual bagging with equipment that adjusts to different bag sizes

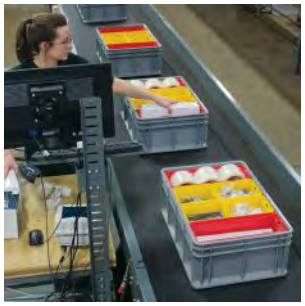
The DT Legacy bagging machine can automate a previously manual process. It automatically hangs and fills several types of bags at speeds up to 20 bags per minute. Features include a large, easy-to-load magazine, automatic indexing, no-bag/no-product sensing and easy bag size adjustments that minimize downtime and increase productivity. Also offered is the TSF-1250 stream-feeder for feeding non-nested products (including batch-counting, on-demand and continuous) into package finishing machines such as shrink-wrappers, flow-wrappers, cartoners and labelers. **Thiele Technologies,** 612-782-1200, www.thieletech.com. Booth C-1800.

Robotic bottle pick-and-place system

The robotic Full Bottle Pick & Place System is engineered to handle a variety of bottle types and sizes—including combinations of products within rainbow cases. It incorporates a KUKA KR16 robot, equipped with a Joulin end-of-arm vacuum assembly, to select filled bottles from an AdaptA mini-buffer system and place them on a tray. Ideal for case packing, the system can also accommodate large container bulk palletizing or removal of select containers for inspection. It can also be used for holding work in process when downstream equipment stops or changes speed, or as a production line de-coupler. **BW Container Systems,** 630-759-6800, www.bwcontainersystems.com. Booth C-5208.

Tote ideal for AS/RS systems

Ideal for automated storage and retrieval systems, the Multi-Load flexibly accommodates changing storage needs. It can be used as a stand-alone tote or with optional, removable bin cups and dividers to create individual compartments inside. An integrated sidewall clip allows the cups and dividers to attach quickly and securely to the tote, while individual cups can be removed from the tote for easy handling at a picking or packing station. Features include a reinforced flat bottom for smooth conveyor travel, ribbed sidewalls and a reinforced rim for durability and long service life. Stackable, the tote also offers large exterior label areas. **Akro-Mils, 800-253-2467, www.akro-mils.com.**



30 x 16-inch container with four-way fork entry

Engineered to maximize line-side space in assembly and manufacturing operations, the BulkTote reusable container has a 30 x 16-inch footprint and four-way fork entry on all sides. The unit's configuration allows a facility to present twice as many heavy, dense parts (including gears and stampings) in half the amount of floor space required by traditional bulk containers with a 32 x 30-inch footprint. Capable of holding loads up to 500 pounds, the container replaces wire baskets, steel tubs or wood/corrugated packaging and weighs less than 30 pounds when empty for easy manual handling. Features include a stacking ridge for secure stacked nesting and an all-plastic, smooth interior that can be cleaned and will not rust or damage parts. Structural foam molded of high-density polyethylene (HDPE), the unit can be fully recycled at the end of its life. It can also be fitted with custom protective dunnage to protect products inside. **ORBIS, 800-890-7292, www.orbiscorporation.com.**

Protect parts during handling, transport with custom dunnage

Custom-engineered interior packaging protects fragile or awkwardly shaped parts against damage during handling and shipping. The dunnage is created to maximize the use of interior tote or container space to accommodate the maximum number of parts possible in each container. Created to conform to the exact shape of the individual part, materials are selected to match the needs of the specific application—including shock or vibration protection, Class A part protection, or electrostatic discharge (ESD) protection for electronics. **Schaefer Systems International, 704-944-4500, www.ssi-schaefer.us/packaging.**

Attached lid containers improved with new lid, ergonomic handles

A new line of 21 x 15-inch attached lid containers feature an improved recessed lid as well as larger, more ergonomic handles than the supplier's previous models. The AC2115 totes may be specified with a solid or open textured bottom in 9- or 12-inch heights and are stocked in light gray or green colors. Other enhancements include lighter tare weight and reinforced corners that allow the units to maintain strength while holding up to 60 pounds. Customization and identification options include a large textured area on one end to eliminate the need for a placard. Fully recyclable, the easy to clean containers are injection-molded of high-density polyethylene (HDPE) to resist impacts, moisture and most chemicals. When empty, the containers nest with their lids open for maximum space in storage and on return trips. **Buckhorn, 800-543-4454, www.buckhorninc.com.**

Interstack family of collapsible, reusable plastic crates with common footprint

Rigid when upright, loaded and stacked, a line of collapsible reusable plastic container crates quickly folds down when empty. They come in a range of five heights with one common 23.6 x 15.75-inch footprint, and feature cross-stack locking that allows them to be layered. Engineered to be ergonomic in manual operations, the easy to assemble and disassemble units can also be used in fully automated systems. **Rehrig Pacific, 800-421-6244, www.rehrigpacific.com.**

Reusable packaging for automotive applications

Made of molded expanded polypropylene (EPP) foam, a selection of molded AIAG-sized returnable totes and dunnage is ideal for automotive returnable packaging applications. The transGuard line is engineered to fit precisely to the product stored inside for maximum packaging yield and minimized space and freight costs. Both the height and interior can be customized to fit uniquely shaped parts—such as headlights and brake pad assemblies.

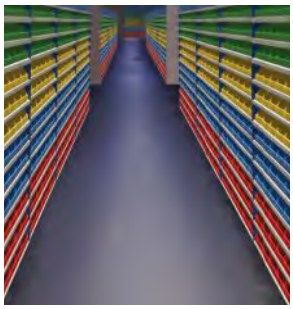
Also offered, a line of bulk bin inserts fit inside a 48 x 45-inch footprint container to organize and maximized product yield per unit. **Sonoco Protective Solutions, 800-289-9966, www.sonocoprotectivesolutions.com.**

Hold parts, not dust with wire mesh bins

Protected by a nickel chrome-plated finish, a selection of wire mesh bins can be stacked or hung from any louvered wall panel or rail system. Engineered to eliminate dirt and dust build up, the open mesh holds industrial parts while debris passes through. The bins come in nine sizes ranging from 5.25 x 4.25 x 3 inches to 18.5 x 17.125 x 11.125 inches. Accessories include hanging label tags, clear label holders and dividers. **Quantum Storage Systems, 800-685-4665, www.quantumstorage.com.**

Hopper totes come in 27 standard sizes

Shipped flat for maximum freight savings, a selection of hopper front totes come in 27 standard sizes from 18 x 6 x 4 inches to 24 x 12 x 10 inches, or can be manufactured in custom sizes for unique applications. Ideal for shelving and carousel storage applications, the totes are made of corrugated plastic and have a smooth front for identification labels. Options include label holders, dividers and anti-electrostatic discharge (ESD) materials. Lasting 20 times longer than corrugated cardboard, the recyclable totes come in five standard colors (blue, black, white, red and gray), and seven special colors (yellow, natural, tan, brown, silver, green and orange). **Flexcon Container, 908-871-7000, www.flexcontainer.com.**



Durable plastic sleeves

Lightweight, collapsible and strong, tri-laminate plastic sleeves come in four configurations and work with any sleeve pack system. They may be specified as a single piece with hinges on either short or long side; as a half-sleeve split on long or short side for easier product loading and unloading; with up to four doors (secured with a choice of locking mechanisms) per sleeve for access to items inside; or three-sided with the long side open for access to stacked products. Reusable and returnable, the long lasting sleeves offer a high return ratio to increase fuel efficiency and reduce shipping and transportation costs. **CON-Pearl, 864-365-0737, www.conpearl.com.**

Reusable and one-way wood shipping crates

A line of reusable and one-way shipping crates made of 0.75-inch thick plywood and oriented strand board (OSB) is fully collapsible and ISPM-15 export compliant. Offered in eight stock sizes (ranging from 22 x 22 x 23 inches to 94 x 46 x 47 inches) that are available for immediate shipment, the crates feature four-way fork entry bases. **Quick-Crate, 800-362-4569, www.quickcrate.com.**

Lids fit any brand of 45 x 48-inch containers

New, heavy-duty structural foam lids made from recycled materials are manufactured for use on all brands of 48 x 45-inch containers. Lids feature reinforced corners for strength and a domed top for water runoff. The supplier also offers a variety of packaging services, including sales and leasing of refurbished, cleaned reusable high-density polyethylene plastic containers, as well as repair, cleaning and recycling. All used units—in a range of sizes and brands—are inspected, repaired and pressure washed before sale. **Resource MHR, 888-934-0905, www.resourcemhr.com.**

Collapsible utility boxes hold up to 2,000 pounds

The C.U.B. collapsible utility box comes in both standard and custom sizes for protecting product loads ranging from 500 to 2,000 pounds during shipping and transport. The units are reusable, ISPM-15 compliant and environmentally friendly. Ideal for shipment of heavy, loose, static or custom parts and loads, the boxes require no tools, clips, fasteners or banding to assemble, and can be set up and taken down in seconds. **FCA Packaging, 855-322-2821, www.collapsiblepackaging.com.**

Fiberglass-reinforced totes ideal for heavy, dense parts

A full line of totes—including stackable and nestable containers, hoppers and trays—is compression-molded of high-strength fiberglass reinforced polyester resin to store, move and ship heavy or dense parts and materials. The Plexton totes and trays feature smooth surfaces and rounded corners for safe handling. Resistant to most oils, moisture, chemicals and solvents, the units withstand temperature ranges from –60°F to 250°F. For organization, the totes may be specified in five standard colors (light blue, green, gray, red and light yellow) for part identification and inventory control. Hopper models come in red, green and gray. Units can be manufactured in fire retardant or hygienic materials, with optional screen-printing and adhesive card-holders for identification. **LEWISBins+, 877-975-3947, www.lewisbins.com.**

Wire mesh containers come in four stocked sizes for quick shipment

WorldTainer wire mesh basket containers for use in manufacturing and distribution are stocked in four sizes for 48-hour quick shipments: junior (20 x 32 x 22 inches), medium (32 x 40 x 34 inches), senior (40 x 48 x 36 inches) and XL (40 x 48 x 42 inches). The junior model uses 0.5 x 0.5-inch electro-galvanized mesh made of 11 gauge wire; the other three feature 2 x 2-inch mesh made of 2 gauge wire. Collapsible and stackable, the containers include a half-front drop gate for easier access to contents and a heavy-duty locking handle to secure the sides when upright. For durability, all channels, feet, handles and wire helix connections are robotic welded and precision formed. Optional accessories include label placards, casters, heavy-duty feet, pallet runner bars, dividers, hinged and removable lids, swing gates, fork pockets and fork stirrups. **Worldwide Material Handling Products, 888-650-9473, www.wwmh.net.**

Plastic bin that disassembles for 5-to-1 return ratio

The Hybrid 44P shipper bin for handling and shipping agricultural products is offered as a replacement for cardboard or wood containers. Made of injection-molded plastic, the 48 x 44-inch bulk container features a plastic basket that snaps securely into four plastic columns, and a base with two-way or four-way fork-lift entry. When empty and ready for return shipment, the pieces can be disassembled in 30 seconds, then nested and stacked for a 5-to-1 return ratio. Ultra-lightweight and modular, the bin's walls and base may be specified with either solid or vented surfaces that maximize airflow. **Macro Plastics, 800-845-6555, www.macroplastics.com.**

Custom-engineered automotive parts packaging

A full line of reusable and disposable containers, totes and dunnage are offered to protect automotive parts and components during transit to manufacturing and assembly processes. Services include custom engineering, concept design and prototyping, container fleet manufacturing, management and repair. Reusable solutions include collapsible bulk containers made of plastic or steel with partitions and formed interior dunnage for Class A surface protection, structural foam lids, rolling steel racks, and corrugated paper and foam packs. **Universal Package Systems, 866-875-9918, www.universalpackage.com.**

Nestable buckets for industrial, commercial use

Manufactured of galvanized, stainless steel (grade 202) or bronze, nestable buckets provide durability in industrial and commercial applications. The galvanized and stainless units come in capacities of 3.25 and 5 gallons; the bronze model holds 2.5 gallons. Ideal for use in hazardous conditions, the bronze bucket is spark resistant. All three include a carrying handle/bail for easy transport and handling. **Vestil, 260-624-4330, www.vestil.com.**

Accurately dispense dry products with hopper container

The reusable Powder-Saver hopper container allows powders, granules, flakes and other dry products to be dispensed accurately in measured amounts to prevent material waste and meet required batch or shot weight specifications. Offered as a replacement for bulk bags, corrugated boxes and flexible intermediate bulk containers, the container eliminates spills and product loss from torn or ruptured bags. Features include a conical, plastic hopper with a slide gate valve within a squared, four-way forklift-able base that can be removed. The base allows the entire hopper to be transported by lift truck, stacked during transport and racked for storage. Rotationally molded from waterproof, chemical- and UV-resistant polyethylene plastic, the translucent hopper holds 31 cubic feet of material and includes molded-in fill level indicators. The unit measures 45.75 x 45.75 x 48.5 inches and may be outfitted with a choice of valve options. **MODRoto, 800-829-4535, www.MODRoto.com.**

Trays and containers for chemical and heat-resistant applications

For processes that include baking chemicals in ovens, a new line of trays and containers made of fiber reinforced composite materials stands up to heat as well as chemicals. Offered as a replacement for porcelain-coated steel trays, the reusable units eliminate corrosion issues. Additionally, they resist cutting oils, greases, radiation, mild acids and alkaline solutions within a pH rating of 3.0 to 10.0. The composite formulation and construction holds up to constant use at temperatures from -60°F to 250°F, and intermittent use up to 300°F. Easier to handle due to lighter weight, the units enable ergonomic, faster loading and unloading of carts. **MFG Tray Company, 814-683-4500, www.mfgtray.com.**

Collapsible, reusable container with foldable sidewalls, drop-down doors

Ideal for shipping and transport of light- to medium-duty goods, such as plastic food packaging, the Poly-Optimum-Pac (POP) collapsible dry container features foldable sidewalls to save up to 65% of used space in transit and storage. Stackable and collapsible, the container resists variable temperatures from -4°F to 104°F and is washable for hygienic applications. For easy access to contents, drop-down doors are engineered into the four sidewalls. The container measures 47.24 x 39.37 x 40.95 inches (1200 x 1000 x 1040 millimeters) when open, and collapses to 14.13 inches (359 millimeters) tall. It holds a maximum load capacity of 1,102 pounds (500 kilograms). **CHEP Pallecon, 888-873-2277, www.cheppallecon.com.**

Replace stretch film, shrinkwrap with reusable mesh material

Applied in approximately 45 seconds and removed in 15 seconds, ergonomic Bulk Wraps secure palletloads with a heavy-duty, weatherproof mesh material. Offered as a recyclable alternative to stretch film and shrinkwrap, the mesh allows better airflow to reduce spoilage. As an eco-friendly reusable shipping and storage system, the wrap reduces protective packaging waste management costs; it also saves time spent wrapping and unwrapping pallets. Wraps can be customized with logos or other graphics. **Nuovo Group, 630-865-1546, www.nuovogroupinc.com.**

Label print-and-apply systems encode, verify RFID tags

A selection of fully automated radio-frequency identification (RFID) print/encode/apply systems—powered by Zebra, Datamax-O'neil, SATO, Printronix and Avery-Dennison print engines—now includes write/verify/print and apply with fully integrated RFID compliance encoding. The all-in-one models can print and encode high-frequency and ultra-high-frequency tags, including UHF EPC Gen 2. An integrated tag handling system detects out-of-spec tags, leaving them on the label liner and preventing them from causing issues downstream. Bad tags are rewound on the label liner, and production continues without impact. Other features include short pitch encoding, counters and auto-calibration functions. The systems are ideal for item-level tracking, inventory management, pallet tracking, work-in-process, compliance labeling, supply management, product identification and track-and-trace applications. **FOX IV Technologies, 724-387-3500, www.foxiv.com.**

New below-the-hook and materials handling equipment lines debut

A new line of below-the-hook and materials handling equipment has been unveiled. Below-the-hook offerings include lifting beams, spreader beams, roll lifters, coil lifters, tongs, sheet lifters and pallet lifters—all designed and manufactured to ASME B30.20 & BTH-1 standards and proof-tested to 125% capacity (certificates supplied at no additional charge). For materials handling, products include fork truck accessories, material stands and material baskets. The devices come in standard, off-the-shelf configurations or can be fully customized and engineered to meet unique application requirements. **Harrington Hoists, 800-233-3010, www.harringtonhoists.com.**

Keep cold air in with highly insulated, high-speed freezer door

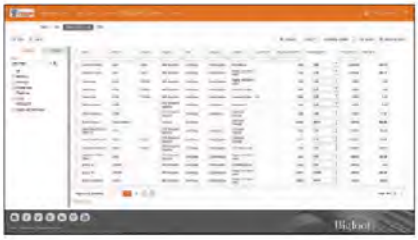
Highly-insulated, the Turbo-Slide freezer door is constructed of totally closed cell EVA foam panels that produce R-values ranging from R-17 (standard) up to R-40. Offered in sliding and bi-part construction options, the doors move at high speeds of up to 120 inches per second to significantly reduce cycle times and infiltration energy loss. A thermoplastic outer shell provides impact resistance and durability to minimize down time and energy loss from panel damage, while a perimeter edge seal keeps cold air in the freezer room by creating an airtight, watertight seal along all edges. **Rytec, 888-467-9832, www.rytecdoors.com.**

Handle half pallets with ultra-compact powered, manual forklifts

Targeting small-format stores and e-commerce retailers, a new line of ultra-compact powered and manual forklift equipment is built to handle half pallets and navigate directly into retail aisles. The E30 and D40 compact pallet trucks support more frequent store replenishment, handle more items in lesser quantities, and accommodate the use of smaller pallet formats in the retail supply chain. **Big Lift/Big Joe Forklifts, 630-916-2600, www.bigjoeforklifts.com.**

VMS evaluates, coordinates forklift fleet/operator activity

T-Matics Mobile, developed by the supplier with Sprint, is a forklift-based vehicle management system offered as either an embedded or aftermarket solution. The cellular telematics solution incorporates monitoring and analytic capabilities to generate reports on individual forklifts and full fleets. Anticipated benefits include better operational visibility, access to unique data for analysis and the ability to make data-driven decisions about lift truck fleet allocation and training needs. **Toyota Industrial Equipment, 800-226-0009, www.toyotaforklifts.com.**



Streamline workflows with computerized maintenance management software

Bigfoot computerized maintenance management system (CMMS) has been enhanced with several new, highly adaptable features to complement a facility's existing maintenance workflows, policies and practices. Highlights include an interactive analysis of labor resources to ensure that appropriate team members are neither over-, nor under-utilized; a work-order-to-purchase-order function that allows required spare parts to be purchased as part of the job; easily modified work order, request and purchasing templates; audit log search and reporting for accountability; and a physical count for control over spare parts based on location and category. **Smartware Group, 866-858-7800, www.bigfootcmms.com.**

Handheld RFID reader ideal for mobile workers

The XM2-RFID UHF mobile computer offers high read range and accuracy in an ergonomic form factor for use by mobile workers. Ideal for retail, transportation, logistics and manufacturing operations, the palm-sized unit weighs 13 ounces and reads ISO18000-6C, EPC Global Class 1 Gen 2 tags. Tested to complete more than 40,000 tag reads on one battery charge, the unit includes Zebra's SE4500 2D imager for decoding of hard-to-read bar codes, a 3.2-inch color display and support for Microsoft's Windows Embedded Handheld 6.5 operating system, and is IP64 sealed for use in challenging environments. **Janam Technologies, 877-526-2699, www.janam.com.**

Expanded capabilities in mobile communication, dispatch system

The two suppliers have unveiled new capabilities within the Prophesy Dispatch transportation management solution and its mobile communications interface. The newly expanded functionalities allow dispatchers to automatically send load information to the driver's in-cab device including: origin, address, city, state, destination, goods information (weight, pieces and pallets), scheduled pick-up date, delivery date and time. Drivers can also send and receive key information such as actual arrival and departure times, bill of lading numbers, inventory measures (number of goods and quantities broken down into weight, pallet and pieces) and trailer number. Through the enhanced communications, drivers can deliver greater levels of safety, compliance, cost reduction and customer service—in addition to loads. **HighJump Software, 800-328-3271, www.highjump.com; PeopleNet, 888-346-3486, www.peoplenetonline.com.**

Charles "Chuck" D. Yuska

PMMI

TITLE: President and CEO, PMMI—The Association for Packaging and Processing Technologies
LOCATION: Reston, Va.
EXPERIENCE: Yuska has been president and CEO of PMMI, The Association for Packaging and Processing Technologies, since 1990. PMMI owns and produces the Pack Expo portfolio of trade shows, including Pack Expo Las Vegas and Pharma Expo 2015 (Sept. 28–30; Las Vegas Convention Center).
DUTIES: PMMI is a trade association representing more than 700 companies. During Yuska's tenure, PMMI has expanded the number of trade shows from one show to seven quickly growing events. In that time, PMMI has become known as an innovator in the association and trade show spaces.

***Modern*: First, congratulations on the 20th-anniversary milestone. Since this is a special event, what can attendees expect to see at Pack Expo Las Vegas?**

Yuska: Pack Expo's Las Vegas event has been consistently providing winning technology solutions for every vertical market since its launch in 1995. This year, we'll host more than 2,000 top-tier exhibitors and 30,000 attendees across 800,000 square feet of exhibit space, and bring Pharma Expo to Las Vegas for the first time. The co-location fosters a "cross-pollination effect." As attendees and exhibitors from a diverse set of vertical markets come together, they'll learn about technologies and best practices from adjacent industries that they can apply to their situations. The show's a huge learning experience with machines in action and a wealth of free educational sessions on the show floor. *Modern*'s readers will want to check out the Reusable Packaging Pavilion sponsored by the Reusable Packaging Association (RPA) and its Reusables Learning Center.

***Modern*: Given your 25 years at PMMI, what are the most important changes you've seen in the packaging industry, especially in the last three to five years?**

Yuska: As sustainability and supply chain efficiency continue to grow in importance, so does the concept of source reduction. Brand owners must constantly evaluate their packaging and determine the best possible combination of variables to move their products from plant to retailer to consumers. That means paying attention to every packaging detail, beginning with the primary package and continuing all the way to the industrial packaging. The goal is to minimize waste and maximize every load of product to be transported. Attendees will have access to all of those solutions.

***Modern*: When I first began writing for *Modern*, we looked at Pack Expo as outside of our realm. Yet, in recent years, materials handling solution providers have begun exhibiting successfully. Meanwhile, we're seeing more packaging solution providers at ProMat. From your perspective, how are our two industries coming together?**

Yuska: Integrated supply chains create fairly complex scenarios. From start to finish, they require efficient ordering and production, packaging and palletizing—and that's just the beginning. Manufacturers can now look at all the components of a supply chain, from production to pallet, and create the most effective systems to meet their customers' needs.

At the same time, sustainability — that is, using our resources as efficiently as possible — is driving the supply chain from start to finish. In packaging, that translates to finding the best combinations of primary and secondary packaging, so products get to their customers with as little waste as possible. When we reach those goals, we see positive things happen for the environment, our companies and our communities. ☐

Having access to real-time information and assistance is crucial to the success of any business. We understand that the best relationships are formed by being fully vested in the outcome; this means treating your business as our own and offering assistance at a moment's notice. The Hytrol Integration Partner Network is the cornerstone of this strategy, offering a unique understanding of your business, as well as a firm commitment to improving efficiency within your facility. Our integration partners go beyond what is expected by providing industry expertise and giving you confidence in every step of the solution. From concept to completion, Hytrol and the Integration Partner Network are by your side. Contact a Hytrol solutions provider today to discover the advantage of a committed network of experts.

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