

Pack Expo: The Push to Automation

With Pack Expo Las Vegas around the corner, we took a look at the state of the packaging industry today to see what you can expect at the show. The answer is more automation.

Alex Cannella, Associate Editor

Jeff Pike, Yaskawa's director of motion group marketing, recalls a time not so long ago when the packaging industry was very different from how it is now. He remembers a time where packaging machines were less complex creations compared to today's multi-servo constructions.

"When I started calling on packaging accounts when I was in sales, every packaging machine had one induction motor and was sort of this Rube Goldberg machine of chains and cams to accomplish all the motion...Over the last 15 years, everything's converted from that type of architecture where there was really fixed mechs with one motor to now when you walk around the show, pretty much every machine you see has 10-15 servo axes and each axis of motion is individually controlled."

How far we've come.

But like any other industry, packaging is constantly evolving at an ever increasingly breakneck pace, and that means that manufacturers need to be constantly paying attention to stay savvy of the latest industry developments to take advantage of. And it just so happens that the best opportunity to do exactly that is coming up in September. The latest rendition of Pack Expo Las Vegas is just around the corner, and it's going to be the place to see what's happening in the U.S. packaging industry for decision makers and machine builders alike.

For Kollmorgen, this will be their sixth Pack Expo, and according to their Business Development Manager, Bill Sutton, those machine builders are a prime reason for them to attend the show. Alongside those machine builders, however, are also those machine builders' customers. For Kollmorgen, Pack Expo offers not just an opportunity to talk shop and drum up business

with their customer base, but also to meet and interchange ideas with the next party on the chain, their customers' customers.

"The majority of our North American customers and many of our international customers exhibit at Pack Expo," Sutton said. "We provide innovative technology solutions for many

of the machine builders that exhibit at the show. We also we provide unique value ideas to the end-user customers that are there to see those machine builders. Both our customers and our customers' customers come to Pack Expo, and it's a great opportunity for us to display our new technology in a creative way to them."





Machine builders in particular will find a lot to see on the showroom floor. As one of the most visible epicenters of the U.S. packaging industry, the show will feature exhibitors of every stripe showing their latest mechanical innovations.

"There's a lot of machines on the show floor," Laura Thompson, senior director of expositions at PMMI, said. "People come to this show and they can see everything in action. And they can find basically anything they need, from components to seeing a full packaging line in action to seeing the finished materials and containers. It's your one-stop shop on where to find everything and stay up on the latest trends in the industry."

That's not just a bullet point that PMMI puts on their website to draw attendees to the show. Long-time exhibitors like Yaskawa also believe that the show is a prime location to see what direction the industry is heading in.

"If you want to see what machine builders are doing...Pack Expo is really the place to see all of that," Pike said. "Outside of just the packaging industry, it's really where a lot of the technology is happening just from a machine building standpoint."

Displays in Motion

Visitors won't get to just set eyes on the latest in packaging machinery—in most cases, they'll get to watch it in action. Often at a show, most booths are stocked with rows of static products

with a single machine that may or may not be running as a centerpiece. At Pack Expo Las Vegas, many exhibitors are filling their booths with fully functional, automated demonstrations of their products in action.

"When you look at our booth today, you don't see any static products," Pike said. "What you see is application solutions for picking, packing, palletizing, and you see the integration of motion and robotic technologies together on those application solutions...Everything that we take to that show now is in motion and being demonstrated."

Yaskawa will have a wide array of fully automated systems on display at their booth in different cells. Front and center will be their palletizing/de-palletizing cell, in which Yaskawa will be demonstrating safety interactions between the cell and an operator. Yaskawa will also be putting on a few demos at their booth, including one of a delta robot running on Yaskawa's IEC-61131 motion controller and another featuring case packing with T-Bots and articulated robot arms. Additional displays will include a cell with two delta robots doing high speed picking and circulation of products on a line, a high-speed robot on display, and even a collaborative robot handing out beer.

In addition, Yaskawa will also be displaying its control solutions. Most prominent amongst these will be their one-size-fits-all control architecture, which they're designing to work on everything from a T-Bot to a delta. The

concept is that if a single application code works with multiple kinds of robots, customers can interchange different mechanisms as needed without having to rewrite the entire code to use them, which reduces the technical requirements for the company to make such a change.

"The control solution is just as important as the mechanical piece," Pike said. "That's where we're driving a lot of our product development: developing a control architecture that allows customers to use the whole continuum of product types, from just buying individual axes to buying a t-bot to buying an articulated arm or doing a specialized mechanism, all inside of one software environment."

Kollmorgen, meanwhile, will be displaying two of their comprehensive, full control systems in operation at their booth. The first will be an aquarium designed to show off Kollmorgen's hygienic motors and IP67 drive system. Motors will be "cleaned" using water spray throughout the show simulating their resistance to daily cleaning routines, and thus value in food processing applications, will also be put on display.

The second display will be a pair of four-foot tall Rock'em Sock'em Robots complete with 14 axes of motion entirely powered by Kollmorgen products, including their automation suite, actuators and servomotors. The robots won't just be fully functional; attendees will even be able to get hands on and play around with them.

According to Sutton, the purpose of the booth is to highlight the company's ability to both construct full system solutions of their own and co-engineer motor and drive solutions that work in tandem with other companies' control solutions.

While at the show, Kollmorgen will also be unveiling their newest servomotor, the AKM-2G, which according to Sutton, features 30-50 percent higher torque density over Kollmorgen's previous products and conventional standards.

Regal Beloit's main feature will be their System Plast Modsor right angle transfer station, which is designed to transfer packages based on a package's momentum.

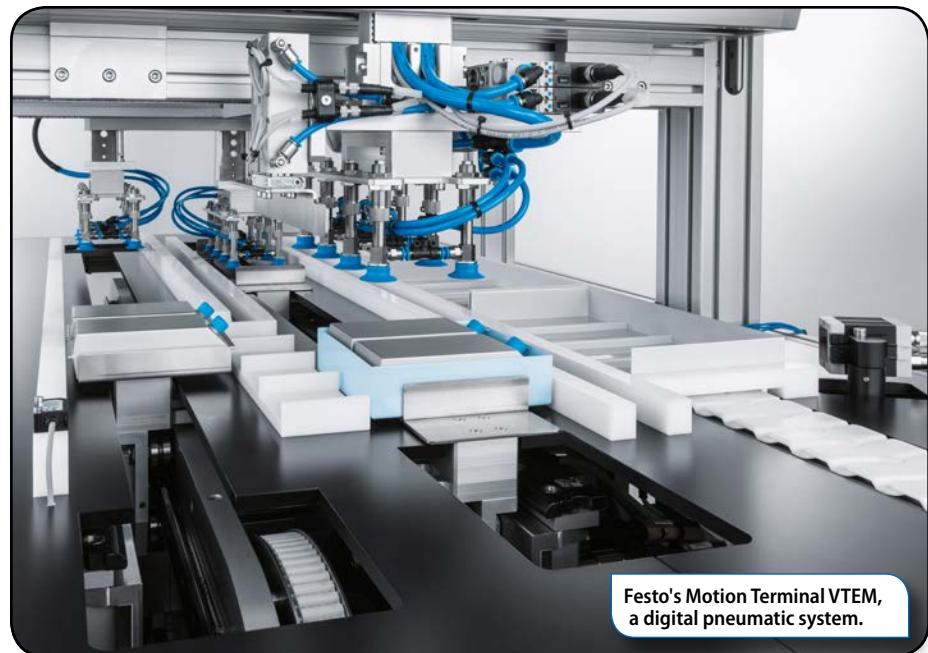
"The Modsort station features the System Plast 2253RT roller top belt, which allows it to uniquely transfer and divert packages based on the sphere's vector speed and direction while also featuring a 1-inch, on-center sphere array to allow for very small packages to be diverted," Mike Suter, Regal Beloit America's vice president of marketing and power transmission solutions, said. "The station can divert on the fly or stop and divert at a true 90-degree angle, and is ideal for poly-bags and small packages while also easily handling boxes."

According to Suter, Modsort stations can be placed end-to-end or integrated with a conveyor depending on your needs, and is also customizable to work with picking and packing stations. It can also be retrofitted into an existing conveyor system.

The Modsort will be on display front and center as a four-square conveyor system designed to show different possible Modsort modules and configurations to illustrate many of the system's benefits. Alongside the Modsort, Regal Beloit will be showing off many of their existing products, including Hub City HERA right angle gear reducers, Grove speed reducers, Marathon Motors, SealMaster and McGill bearing products and other System Plast conveying components.

For the first time in North America, Festo will be unveiling its Motion Terminal VTEM, a digital pneumatic system that can replace 50 different pneumatic components with downloadable software apps. Festo says the Motion Terminal VTEM is the first of its kind digital pneumatic system—a controller and flexible valves. Combinations of apps are used to perform various functions such as motion with leak detection and energy savings or proportional directional motion. At the Festo Pack Expo booth, five different VTEM controlled motion functions will be showcased in active demos. Festo will also be showing its range of systems optimized for motion in packaging applications including gantry systems, IO-Linked enabled devices, and pneumatic and electric motion control on a single control platform.

Amongst their numerous offerings,



Festo's Motion Terminal VTEM, a digital pneumatic system.

Siemens will be displaying their Sinamics G120C drive, which recently came out with a new AA frame size that's smaller than previous G120C A models but offers equivalent power ratings. This new "tiny drive" is designed to save up to 32 percent of space in a control cabinet compared to the A size it's replacing. The G120C also features cable lengths of 50 meters shielded and 150 meters unshielded.

Siemens will also be bringing back their Mechatronics Concept Designer, which was amongst the products they brought to Pack Expo last year. The Mechatronics Concept Designer is one of Siemens' CAD programs that features two different modes. In manual mode, users can trigger individual axes, while production mode allows axes to be moved synchronously towards each other on electrical cam discs. The Mechatronics Concept Designer is an ideal way to design a machine and double-check its functions for optimization before it's actually built.

Taking center stage at Bosch Rexroth's showcase will be their Industrial Internet-centric analytics and control equipment, the newest addition of which is their IoT Gateway. Bosch Rexroth's Gateway is a product that takes in and collects a constant stream of data from sensors on a machine or part, such as a motor or drive, for example, and sends that data onward to be analyzed. Vibration, temperature, per-

formance, the Gateway monitors it all over time.

What the Gateway can't do, however, is allow users to study the data. While users can study what the Gateway is picking up in real time, it doesn't store the data, but instead works as a conduit to interpret and transfer the massive waves of data produced by constantly monitoring a machine to an analysis tool or software.

"You have a simple interface to see what's going on live," Brian Schmidt, application supervisor at Bosch Rexroth, said. "But most likely, you're going to want to do something with that data more than just looking at it real time. You're going to want to analyze it, look for trends, like maybe temperature changes or vibrations that get worse over time."

It should come as no surprise that Bosch already provides products to complement the IoT Gateway and provide complete data analytics and enterprise management solutions. The Production Performance Manager (PPM), developed by Bosch Software Innovations, is one such software product on display at Pack Expo. Using PPM's toolset, engineers and plant managers can analyze trends over time in their machines to better understand the causes of reduced productivity, receive early indicators of mechanical failure before a breakdown occurs, and ensure corrective actions are taken us-

ing the Ticket Management feature.

On the more physical side of things, Bosch Rexroth will be displaying single-cable motors that feature a cable link that can be expanded as far as 75 meters, alongside their usual drives and control systems. However, Bosch Rexroth's focus currently is on the automation and incorporating Industrial Internet technologies into their packaging solutions.

"The trend in the market is more line integration in terms of adding robotics to the line, and also the evolution of the Internet of Things," Kin Yung, director of the printing and packaging industry sector at Bosch Rexroth, said. "So our main focus this year is on connected automation."

Driving Automation

Bosch Rexroth's focus going into 2017's Pack Expo shouldn't be much of a shock. There have been whispers of the advent of the "Fourth Industrial Revolution" for years, and the technological leaps it promises have been a central focus of almost every trade show or conference to happen this year. Much like the rest of the industrial world, packaging isn't just pushing into a brave new world of automation—many would argue that it's already there.

But what about the other side of the equation that Yung sees the industry shifting towards: robotics? It might not be a surprise to see robots becoming increasingly implemented in the industry as a whole, but the shift that is more eye-catching is that robots are

becoming a vital part of the packaging machines themselves.

According to Pike, robotics and motion control are becoming increasingly intertwined bedfellows in the packaging industry. Robotic applications are starting to require more sophisticated motion control solutions, motion control guys will find an ever-hungrier market for their products in the robotics sector, and the actual machine builders are going to see more and more competitors with increasingly sophisticated and competitive machines utilizing the latest results of the increasingly solidified union between those two fields.

Yaskawa has already begun responding to the shift in demand accordingly. In recent years, the company's robotics and motion control groups have started coming together and undergone joint ventures.

"We saw that progression happen in the packaging industry where people were starting to have robots and standard motion technology inside of the same machine and they sat together and needed to interact," Pike said. "And really when we started digging into this five years ago, what customers were saying was 'I'm starting to do this. I'm starting to put a robot inside a machine or right next to a machine. I want to reduce the number of processors. I want to reduce the number of controllers in my system. I want to bring all this stuff together.' That's when we started saying 'ok, we have some value to bring to this space' rather than just selling components."

Siemens' G120C drives, the smallest of which, the AA, will be on display for the first time at Pack Expo this year.



According to Pike, demand has only risen since Yaskawa's two groups began cross-pollinating, and he doesn't see it stopping anytime soon.

"The interest in robotic technology and more advanced motion control is just increasing," Pike said. "What we see driving that...is the end users are asking for more effective, more flexible machines, mobile robotics, things that are just not fixed anymore."

Perhaps most telling of the direction that the packaging industry is going isn't what's expected to happen at Pack Expo, but what's already happened at Interpack. When Yaskawa attended the show, they witnessed first hand the industrial shift to lean more heavily on robotics and automation in full force in Europe.

"When we went to Interpack, we saw that everywhere," Pike said. "And I think the manufacturers in the U.S. are a little bit behind that, so that's really what we're going to be looking for at [Pack Expo] this year is how much is that starting to be adopted in the U.S.—that concept of a purpose-built mechanism rather than a gantry or a t-bot or h-bot or some sort of a cartesian mechanism."

Bosch Rexroth, similarly, was on hand at Interpack as an exhibitor, where they were amongst the throng of companies showing off their latest advances in Industrial Internet technology as they intend to be at Pack Expo. Amongst their

exhibits, they showed off simulation software that could simulate a virtual twin of a potential packaging machine and how it would perform before the machine was ever built.

"They can do the simulation even down to the motor performance..." Yung said. "Do an animation to simulate that virtual machine. So we can do like virtual commissioning, basically."

Pack Expo: Keystone for the Industry

How the U.S. packaging industry will reflect these shifts will be seen soon enough. Pack Expo Las Vegas is coming up fast next month, and there will be plenty for all in attendance to see for themselves what direction the industry is moving in. And not only will attendees be able to see the future exhibited on the floor, they'll also be able to check out Pack Expo's extensive educational offerings, the most notable of which will be the 54 presentations that will make up Pack Expo's Innovation Stage.

The Innovation Stage will be a central hub at the show, with presentations running throughout each day right on the trade show floor. Presentations will cover the latest advances in the industry and are designed to pack as much information as possible while remaining unobtrusive affairs with careful attention paid to convenience and ease of access.

"In our outreach to attendees, we've always been told they want something that's easy for them to drop in, something on the show floor," Thompson said. "They don't necessarily want to commit to going to a meeting room for two hours. These are nice, quick, easy to access presentations. They're about 30 minutes, right on the show floor, that are free of charge."

Sutton's coworkers at Kollmorgen, both sales representatives and machine tool builders alike, have found the brief seminars to be filled with interesting, useful information on everything from trends in the industry and spotlights on specific topics like connectivity to new products that either complement or compete with their own.

In addition to the Innovation Stage, Pack Expo will also feature a few individual workforce seminars. One occur-



Also at Kollmorgen's booth: an aquarium designed to show off their motors' resilience to water.

ring before the show will focus on the benefits of risk assessment programs, as well as how to go about conducting them, while another during the show will look at best practices for training your employees at every level, from technicians to even other trainers.

But regardless of what lessons might be learned next month at Pack Expo, Pike is excited to be here in this moment in the industry's progression.

"It's an exciting time in the industry, to be there as things are transitioning to new technology," Pike said. "As a vendor, it makes what we do a lot more fun. [There are] things coming up that are really challenging. Like, how do I put this robot on the back of a vehicle and let it drive around and pick things? Or how do I look into the back of a truck and unload a set of cases? Or how do I pack a case that has mixed product from five different lines and throw a hat in there? We're all engineers and we like to solve fun problems. It's making the industry really interesting and exciting right now."

The solutions to those problems, and the many problems like them, are the future of the packaging industry. And they'll be on display right before your eyes at Pack Expo, Sept. 25-27 at the Las Vegas Convention Center.

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