

Higher Labor Costs, Ergonomics Driving Robotic Packaging and Palletizing

By Rob Spencer
Editor

Although the total number of robot orders fell 4 percent in the second quarter when compared with the second quarter of 2001, the sales of robots for material-handling tasks increased 20 percent.

"Material-handling robots are sold into a broad range of industries and represent the largest application area for the industry," said Don Vincent, executive vice president of the Robotic Industries Association. "Growth in material-handling orders usually indicates that the robotics industry is making inroads in reaching customers in industries such as consumer goods, food and beverage, pharmaceuticals and other non-automotive markets, a key to our long-term success."

Material handling encompasses a range of applications, including packaging and palletizing. The increases in orders of mater-

ial-handling robots, despite the sluggish economy, could be a testament to the fact that robotic systems are a long-term investment because of their flexibility in handling changing products.

"The economy doesn't usually play into engineering decisions," said Stephen Harris, president of Rixan Associates, a systems integration company and distributor of Mitsubishi and Samsung robots. "(Switching to robotics) is an engineering decision and, while you have to have a good ROI, a company needs to look forward to what their needs are going to be for the next 10 to 15 years, because that's how long a robot will last. It's a good piece of equipment if you plan correctly."

ROBOTS IN PACKAGING

One area where robotic packaging is getting a lot of attention is the food and bev-

erage industry, where labor costs are increasing and where repetitive stress injuries have long been a problem among workers.

"The cost of labor in the food industry is starting to get to point where direct labor savings is becoming more of an issue," said Joe Campbell, vice president of marketing for Adept Technology Inc. "In the past, that wasn't as big an issue. That industry has always been big on indirect savings, because of repetitive stress injuries."

Flexible packaging lines are also becoming prevalent among consumer goods companies, in large part because of the rapid product changes, the range of different products and the different ways in which they're packaged.

"The configuration of packaging demands robots or similar automation," Campbell said. "That's become one of real motivators."

Along with labor savings and fewer repetitive stress injuries, a benefit of robotic packaging is more consistent packaging.

"It's not just labor savings," Harris said. "You see a quality improvement in what you're packaging. Let's say you need to package 12 items to a case. After a while, a person might pack only 11, while the automated solution will always pack 12. And that applies to any process where you want to use a robot."

Packaging is also one of those applications that can be performed by just about any type of robot, with articulated arms, SCARAs, cartesians and delta robots all getting their share of packaging duties in any number of industries. Each type has particular attributes or combinations of attributes that help determine which is used.

"The choice is driven by such considerations as payload, product mix and pack strategy, and in some cases it's driven by economics and the life cycle of the machine," Campbell said.

The choice also is driven by customer preferences, particularly when more than



Robotic packaging systems are making inroads in the food industry, where rising labor costs and ergonomic issues are prompting companies to look at flexible automation.



Robotic palletizing systems offer versatility not found in traditional palletizing unitizers. This Columbia/Okura palletizing robot can stack bags either on a standard pallet or on a single-stack pallet for individual orders.

one type of robot will do the job.

“Many times there are multiple solutions, so you ask customers what they’re most comfortable with,” Harris said. “We like to design for the future. If the price is similar for different solutions, say a three-axis solution versus a five-axis solution, we prefer to go with the five-axis solution for future flexibility.”

ROBOTS IN PALLETIZING

Just about every company that packages product in boxes, cans or bags needs to palletize those containers at the end of the production line. And, while traditional automated palletizers, often called unitizers, have an edge over robotics in many facilities because of their sheer speed, robotic palletizing is a viable middle-of-the-road alternative between traditional unitizers and manual palletizing.

“Unitizers demand a higher rate of uniform product, and some companies feel they’re not ready for them,” said Carl Traynor, senior director of marketing for Motoman Inc. “Robotics provides a bridge between manual palletizing and unitizers. With robots, you can have a couple of infeed stations and a couple of outfeed stations and palletize different products at different time. With robotics, you can have more product variability.”

Some of the same factors that drive

robotic packaging are helping to drive robotic palletizing.

“Ergonomic considerations are starting to come into play in making decisions about using robotic palletizing,” said Mark Andrews, operations manager for Columbia/Okura LLC, which specializes in robotic palletizing. “Injury claims can be expensive. One back injury claim can pay for one of our machines. People are also saying it’s difficult to hire people to

do palletizing jobs, especially in hot climates.”

People also are less likely than automation, whether it’s a unitizer or robotics, to keep up with production requirements, said Jack Justice, applications engineering manager for Motoman.

“With consistent packaging and no damage to product with automation, companies have to automate palletizing,” he said. “When you have eight to 10 cases per minute, people can’t keep up. And with some types of palletizing, the patterns are critical. People don’t do consistent patterns, or they forget. Companies that are getting into robotic palletizing, typically, can’t afford not to.”

While robotic palletizing is faster and more consistent than manual labor, such systems are slower than unitizers. But, as Traynor pointed out, robotic systems are attractive to companies that aren’t ready for unitizers, either because they’re too expensive or take up too much room.

One of the main benefits of robotic palletizing over unitizers is that the robotic system takes up less space, both horizontally and vertically.

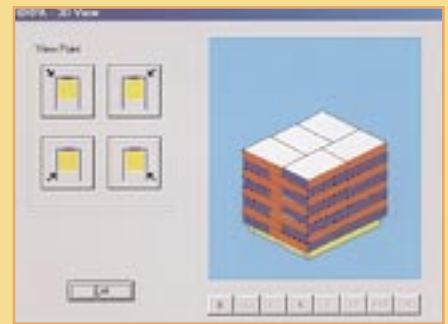
“Robotic palletizers have a smaller footprint (than unitizers),” Andrews said. “They’re easier to locate in tighter areas, like corners, and in areas that have low ceilings.”

And, as is true with all applications, robotic palletizers are more versatile than unitizers.

“You can handle three or four lines with one robot,” Andrews said. “Robots also can handle different products more easily, such as a 15-inch box one day and a 30-inch box the next. There’s so much more versatility.”

In another variation on that versatility, and one that speeds up the process, two robots work together to form a pallet.

“You use one robot to form a layer, then a bigger one to pick up the entire layer and set it on the pallet,” Traynor said. “That’s coming into place now. With that configuration, robots are moving more and more into the unitizer field and getting the volumes of mid-size unitizers.”



Windows-based software, like Columbia/Okura’s OXPA-DIY, allows users to create, edit and download custom robotic palletizing pattern programs.

On the other end – smaller production lines that don’t require the speed – Motoman, Columbia/Okura and others offer pre-engineered solutions, such as Motoman’s PalletWorld Lite.

“PalletWorld Lite is designed as an end-of-line solution to serve one product line,” Justice said. “A tremendous amount of companies will ship in a configuration. PalletWorld Lite plugs into the end of line where production ends with case packing.”

Motoman also offers palletizing modules reconfigured for different layouts and optimal cell layouts, which offer the best solution for optimized speed.

Programming palletizing robots is also much easier than it was even several years ago.

“PC-based programming software has taken a lot of the guesswork out of programming,” Andrews said. “You punch in the box size and how high to stack, and the software comes back with different patterns. You choose one and put it into the system.” **RW**