

Delivering immediate 99% efficiency and a complete, integrated manufacturing solution

Manufacturers have traditionally used vibratory bowl feeders to feed individual component parts for assembly on industrial production lines. They are used when small components must be fed into another machine one at a time, and oriented in a specific direction.

However, bowl feeders are problematic in several ways. They require significant mechanical adjustments to ensure that parts are feeding consistently and oriented correctly. Making changeovers to pick up new parts can take hours, resulting in costly downtime. And since most machines vibrate continuously, operation is noisy.

Omron worked with integrator Armo Tool in London, Ontario and Tier One distributor Taylor Fluid Systems of Stratford, Ontario to create a complete Omron Sysmac solution for an automotive original equipment manufacturer (OEM) that produces brake lines for multiple passenger vehicles. The OEM previously used a bowl feeder to sort its various end-form fittings that it attaches to brake line pipes, but constant changeovers to pick up new pieces created an unacceptable level of downtime.

"Bowl feeders require black magic to run efficiently, plus they're constantly vibrating, so they make lots of noise," says Rick Tomaszewski, Territory Account Manager for Omron Automation America. "We created a complete Sysmac solution that includes an AnyFeeder™ system, NJ processor, multiple Rotary and Linear servos, FH vision and two E-Cobra 600 robots. This solution delivered 99% efficiency right at startup, versus 70% or less from the previous bowl feeder. Changeover time has been drastically reduced to under ten minutes."

A critical pair

It is imperative that the correct end-form fitting is attached to the correct brake line pipe. Affixing the wrong fitting

could spell disaster. It could expose drivers to brake failure, and the OEM and other parties to costly, brand-damaging litigation. Moreover, with today's just-in-time delivery systems, there is no time to correct mistakes once brake lines arrive on the car-maker's assembly line.

Omron's AnyFeeder reduces downtime and improves accuracy

The AnyFeeder is an economical alternative to well-known, conventional part feeding techniques. When combined with a robot and vision guidance, it provides flexible part-feeding that exceeds the capacity of hand-tooled bowl feeders. Its flexibility in feeding small parts of various size, shape and material allow for fast line changeover and significantly reduced tooling costs, to deliver a crucial competitive advantage.

Tomaszewski notes, "With the AnyFeeder, our OEM can now run multiple fittings at the same time using just one tool. And they can poka-yoke it, which guarantees they always run the right fitting onto the pipe or tube."

A poka-yoke is any mechanism in a lean manufacturing process that helps an equipment operator avoid mistakes. Its purpose is to eliminate product defects by preventing, correcting or drawing attention to human errors as they occur.

Lead time is shorter too, says Carl Hofstede, Engineering Manager at Armo Tool, who adds, "Previously, we had to wait 12 weeks or more for delivery of a bowl feeder. Now we can stock AnyFeeders with a much quicker turnaround."

Plus, since the AnyFeeder isn't constantly vibrating, it's much quieter than standard bowl feeders. It dispenses three to four fittings at a time, then the shaking stops and the robot picks up what it needs.

■ Business Need

Manufacturers are looking to minimize downtime due to constant bowl feeder adjustments. Handling multiple parts on the same production machine improves ROI, but they also want the ability to poka-yoke parts prior to picking, which improves accuracy of the process.

■ Unique Challenges

Omron developed a complete Sysmac solution that includes an NJ processor, multiple Rotary & Linear servos, FH vision and two E-Cobra 600 Robots with an AnyFeeder system.

■ Customer Benefits

The system delivered 99% efficiency at startup, and changeover time has been reduced dramatically to less than 10 minutes. Spare parts requirements are reduced, eliminating the need for custom bowl feeders. The customer now only needs to focus on one project programming file, with no separate robot program file to maintain and support.



FH vision system provides faster, precise inspection and measurement

The system includes an FH pick-and-place vision sensor that is paired with two megapixel, black & white cameras.

“The AnyFeeder™ uses vision to select randomly oriented parts on the bed,” Tomaszewski continues. “Vision verifies the pickup coordinates so the robot always picks up the right part. The head will rotate to match the drop-off position, so it’s always dropped off in the correct orientation every time.”

FH vision systems are designed for seamless integration with Omron Sysmac PLCs, Motion Controllers and Robotic Control Systems. Exceptionally efficient vision algorithms and high-speed image processing make the FH perfect for applications in speed manufacturing machines of all types.

E-Cobra 600 SCARA robot handles application complexity

The system also features two Omron E-Cobra 600 SCARA robots. This robot has a compact system footprint, which saves valuable floor space while minimizing installation costs and complexity.

What’s more, users can calibrate the robot, and empty the parts bin for changeovers and diagnose the complete system—all from the HMI interface.

One singular, integrated solution

Omron provides the entire integrated solution—the controller, the motion and the vision.

“We’re completely satisfied with Omron’s Sysmac solution,” says an OEM representative. “Efficiency is near-perfect. We have unprecedented flexibility to accurately pick up parts. Changeovers

only take minutes, instead of hours. Repeatability is better. One engineer can handle all the programming. And we only have one call to make for support. It works so well, we are considering buying another—and one of our competitors has expressed interest in the system too!”

Tomaszewski recalls, “We showed Armo that this complete solution would work with an AnyFeeder, pre-engineered it and tested everything for them. Omron believes in supporting our machine builders and their customers.”

Omron Automation is a global automation partner that creates, manufactures and services fully integrated automation solutions. We provide controls, vision, safety, motion and robotics for the automotive, semiconductor, food/beverage, packaging, pharmaceutical and infrastructure industries.

For over 80 years, Omron has helped industrial businesses maximize potential by solving problems creatively. Currently headed by President Yoshihito Yamada, our company is 36,000 employees strong—providing products and service in more than 110 countries worldwide.

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