

**Problem:**

Achieve precise control over critical container-lifting sequence and simplify a complicated product changeover process.

**Solution:**

ICR Plus SmartActuator® with integrated servo motor/controller in a reverse-parallel mounting configuration.

**Results:**

Consistent, precise lifting control enhanced powder-filling process and made switching from one container size to another fast, efficient and easy.

## Tolomatic's SmartActuator® simplifies product changeovers on powder-filling packaging machine

*Replacing a pneumatic actuator with Tolomatic's new ICR Plus SmartActuator facilitates rapid and accurate filling adjustments when changing products or containers.*

EXTON, Pennsylvania – Pneumatic actuators, known for their cost-effective power and speed, are traditional workhorses in the packaging industry. Yet when a leading manufacturer of automated powder-filling packaging equipment wanted to gain greater control over a critical container-lifting sequence, it decided to employ an electric rod-style actuator. The change was aimed at making product

changeovers faster and easier for customers who used the packaging machines for filling a variety of container sizes. While the original pneumatic actuator worked well once set up, adjusting its force and speed to accommodate a different size container was complicated. To simplify a customer's need for faster and easier product changeovers, the manufacturer, All-Fill, Inc., is now installing Tolomatic programmable electric ICR Plus rod-style SmartActuators for this critical container-lifting application.



All-Fill specializes in packaging equipment for the food, pharmaceutical and chemical industries. The company's line of automatic auger machines fills rigid containers with many different types of dry products, ranging from coffee and protein

powders to baking ingredients and granulated bleach.

When the type of product or the type of container needs to change, a critical container-lifting actuator must be adjusted to accommodate the new container size or filling rate. The automated machine, which relies on pneumatic actuators to move and manipulate products, was recently outfitted with a Tolomatic electric ICR Plus rod-style SmartActuator to take over the critical container-lifting maneuver. During product changeovers, the ICR Plus actuator has eliminated the time-consuming, trial-and-error method required for changes to the pneumatic actuator it replaced.

All-Fill's automatic filling machine consists of a filling head and a motorized chain conveyor mounted on a frame base. Containers are moved into position under the filling head and lifted by the Tolomatic ICR Plus actuator so that the tube of the filling funnel begins to fill from the bottom. As the material starts to flow into the container, the container is lowered at a controlled rate. When completely filled, the container moves down the line and an empty container is lifted into position.

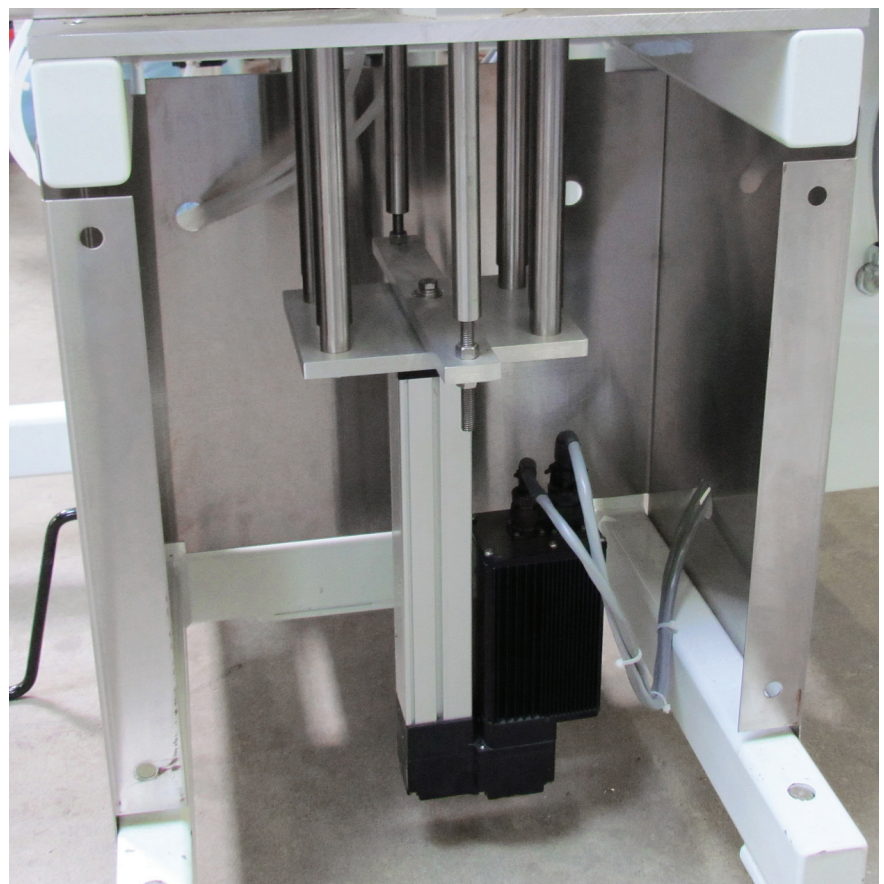
#### **Powders and containers vary**

"We're filling powders of all different kinds," says Dave Kendall, mechanical engineering supervisor for All-Fill. "When we employ a container lift on a machine, it's usually because the powder being filled is non free-flowing. With that lift, we're filling the container from the bottom up, and the container drops as it fills. This provides uniform fills and compacts the product to make sure it fits in the container."

All-Fill employed a pneumatic actuator for the container lift function on its automated machines prior to using the Tolomatic ICR Plus actuator. To get the same speed and power of the pneumatic actuator, the Tolomatic ICR Plus uses a servomotor. "We're still using pneumatics in some of our models, but the servo-electric actuator is easier to operate and easier to set for different-size containers," says Kendall. "For example, some customers may have a wide range of container heights that they want to fill. With the ICR Plus, you can just program in how far you

want it to go up and down, and at what rate. This is very helpful during product changeovers."

While pneumatic actuators offer cost-effective power and speed, electric actuators offer greater control and easy programmability. "During product changeovers with a pneumatic cylinder, it's more a matter of adjusting flow-control valves and going through a lot of trial and error," says Kendall. "Pneumatic actuators are faster going up in this application, but not as easy to control coming down. With the ICR



Located in a cabinet beneath an All Fill powder filling machine, the Tolomatic electric ICR SmartActuator lifts containers and then lowers them as they fill. The compact electric actuator facilitates quicker and more precise product changeovers compared to the pneumatic actuator it replaced.

Plus installed, the machine is more operator-friendly and makes for easier product changeovers.”

### **Power, speed and duty cycle are important**

Bob Gordon, a sales engineer with Penn Air, a Tolomatic distributor, introduced All-Fill to the Tolomatic ICR Plus actuator for this application. Gordon says that All-Fill had initially looked at an electric actuator solution that used a stepper motor, but it had some drawbacks. “The electric actuator with a stepper motor couldn’t run fast enough for the application or maintain the required duty cycle,” says Gordon. “In contrast, the Tolomatic ICR Plus actuator uses a servomotor and is rated at a 100 percent duty cycle – which means it can go up and down all day long without overheating or burning up.”

While All-Fill had not used Tolomatic actuators in the past, Gordon says that the ICR Plus was the best solution because it is self-contained (i.e., motor, actuator and controller) and very easy to program. “The ‘all-in-one-package’ was key to its selection,” he says. “Since the actuator mounts in a cabinet under the machine’s conveyor system, there was a fixed envelope that it had to fit into. All-Fill simply removed a couple of solenoid valves, installed the ICR Plus, plugged in a couple of cables, tweaked the programming and the machine was set to go. And because the ICR Plus is a complete actuator package, all it needs is a power supply and some command signals.”

### **Integrated actuator-controller saves space**

According to Isak Keskitalo, a regional sales manager with Tolomatic, the ICR Plus had several advantages in this particular application. “Because the filling machine was already designed and built, if you had used a traditional electric actuator, the drive/controller would have to have been located in a separate cabinet,” says Keskitalo. “So the integration of the controller into the actuator allowed All-Fill to keep the design of the filling machine as it was without having to add additional cabinet space. To help keep the actuator package even more compact and fit the space, this ICR Plus was fitted with a reverse-parallel mounted servomotor. In addition, the combined package of actuator, motor and controller is IP65 rated for water wash-down,” he says.

Keskitalo adds that the ICR Plus operates on either 24 VDC or 48 VDC and accepts signals from PLCs, sensors, network communication or an existing motion controller. It features extend/retract functionality similar to that of pneumatic cylinders; a flexible indexer programming environment; optional CANopen and DeviceNet communication to daisy chain up to 127 axes; stand-alone operation; stepper mode; and analog position mode.

That kind of flexibility is helping All-Fill build automatic powder-filling machines to easily handle the widest possible variety of products and containers. It also means that their customers will experience faster and easier product changeovers and higher productivity from their packaging equipment.

**Tolomatic** has been a leading supplier of electric linear motion and pneumatic actuators for more than 50 years. Its extensive product line also includes servo-driven high-thrust actuators, servo- and stepper motors and drives, and configured linear motion systems. Tolomatic’s electric linear and pneumatic actuators are used in a variety of industries including packaging, material handling, medical, food processing, automotive, semiconductor and general automation. Tolomatic also manufactures right-angle gear drives, caliper disc brakes and clutches.



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