RFID Instructs Robots at Factories for Plastic Parts

Equipped with an RFID interrogator, the robot's arm determines if its mechanical hand is the correct one for the job.

By Beth Bacheldor

Oct. 9, 2006—Wittmann, a manufacturer of automation systems for the plastics industry, has made one of its robots smarter with RFID. The company has introduced a system utilizing RFID tags and readers to identify the type of mechanical hand attached a robot's arm, enabling it to determine the correct sequence it must perform to make plastic parts.

Wittmann, headquartered in Vienna, Austria, with offices worldwide, has added passive EPCglobal Gen 1 Class 1 RFID tags to its End-of-Arm Tooling (EOAT). An EOAT consists of a mechanical gripper attached to a manufacturing robot's arm and acts as a hand to pick up molds—typically on a conveyor belt—that have been injected with plastic and cooled to form a part. The EOAT then removes the hardened plastic parts from the molds and puts the parts onto the conveyor and back into the production line.

Each EOAT requires specific, coded instructions programmed to match the plastic mold being used, according to Duane Royce, vice president of the robot division for Wittmann's U.S. operation. Whenever a new mold is brought into the production operation, floor operators typically have to load a new program file into the molding machine, attach the appropriate EOAT to the robot and load a new, corresponding program into the robot to direct the EOAT. "The use of RFID is to try and remove that responsibility from the operator, or at least serve as a way to double-check that the right program is loaded," says Royce. If the system were to use the wrong EOAT and program, the EOAT could, for example, swing or move in the wrong direction and break.

Before affixing an RFID tag to the EOAT, the system encodes it with a unique, 64-bit-long identification number associated with a specific tooling program within the software used to control the robot and EOAT. Each tag is approximately 3.5 millimeters in diameter and 30 millimeters long, and is enclosed in a plastic casing designed to create sufficient distance between the mold and the tag. "We learned early on that if you get too close to the metal plate the tooling is made of, there would be problems with interference," Royce says.

During production, the robot's program file manager and mold machine can be networked so the program file loads automatically. However, in some cases, the operator picks the robotic sequence from a screen based on the mold being used. The work then attaches the appropriate EOAT for that mold, and that EOAT's tag is read by an interrogator with an antenna fixed to the robot arm's vertical axis. The robot's software automatically checks its software file system for the tag's ID number and correlating program sequence to ensure the correct EOAT is attached for that mold, and that the correct sequence has been chosen.

Wittmann demonstrated its RFID-enabled EOAT recognition system at NPE 2006 an international plastics

exposition held in Chicago from June 19 to 23, 2006. Royce says the product was received well. "It's a fairly new product—so far, only two customers are currently using it. But the ones that are using it say it has been doing exactly what they want it to do, and say it is easy to use. We had a lot of inquiries after we demonstrated it."

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