EXCELLING AT BOTH ENDS OF SPECTRUM
Automation Plastics produces precision, large parts

By Ron Shinn

WALK THROUGH custom injection molder Automation Plastics’ plant and you will find two extremes. Some of the presses are turning out millions of tiny precision-molded parts, while other presses are producing precision parts with 3-inch thick walls that weigh more than 20 pounds each.

“One of the things that is unique about Automation Plastics is that we have got this niche for high-precision, super-high-volume parts,” said Jeff Ignatowski, VP of sales and marketing. “Then, we have got the other end of the spectrum that are large parts with thick walls. The challenge there is that they cannot have internal voids or inclusions. Again, high precision.”

Ignatowski said there are probably only a handful of custom molders that mold, then machine, their parts. “We have a whole room dedicated to machining the plastic parts we mold to add threads on the inside and outside diameters and to create sealing surfaces.”

Being successful at micro-molding, thick-wall molding and machining takes focus and attention to detail.

Automation Plastics did not start out with a plan to mold and machine such diverse parts. That combination evolved from customer requests. The company was founded in 1979 with four injection molding machines. It molded its first thick-wall parts for natural gas distribution systems in 1985. That same year, it also started molding an aerosol valve.

Harry Smith purchased Automation Plastics in 1999 and that year the company ran for the first time a 160-cavity mold that produced 1.6 million parts per day.

Today, the company has 33 injection presses with clamping forces ranging from 38 tons to 500 tons. Twenty of the 33 are all-electric machines.

Sales topped $12 million last year, but, even with success, the leadership team is trying to transform the company.

“During 2018, we took an aggressive look at ourselves and saw the organization as a diamond in the rough,” Smith said. “We can make this good injection molding company into one of the best in the world. That is really our goal.”

To accomplish that, Smith brought in Dave Robison from Honeywell to become VP of engineering, a new position. Next came Ignatowski from automotive molder Prism Plastics and Ken Wedel from Newell Rubbermaid as director of operations.

The transformation, which will take about two years, started about a year ago with cosmetics: the company’s first sign in front of the plant; a light-colored epoxy floor paint; the organization of all the peripheral items typically found around an injection press; and a $100 annual allowance for each employee to buy shirts and jackets with the company logo. The company also scrubbed the presses and auxiliary equipment.

The mold maintenance department moved from the front of the plant to a new room just off the injection molding floor. This opened up space to better organize the molding presses.

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The company purchased three new Niigata presses in the last 12 months to replace older models. It is reviewing all quality systems and upgrading them, where necessary. The company is ISO 9001:2015 certified and has launched an effort to gain IATF 16949:2016 automotive certification this year.

A central chiller system from Thermal Care was scheduled to be installed this month. Some 20 state-of-the-art temperature control units with Industry 4.0 capability, also from Thermal Care, have been purchased and will be delivered soon.

Smith said Industry 4.0 capability is a major consideration for all new equipment, such as the central chilling system.

The company chose Thermal Care over other competitors for the new chiller system because Automation Plastics personnel liked Thermal Care’s variable-frequency control, which will save energy and has redundancy built into the system.

“I think they have engineered a really good control system,” Smith said.

Automation Plastics has 13 Niigata presses with clamping forces ranging from 110 tons to 500 tons, 13 Arburgs ranging from 38 tons to 220 tons, and seven older Van Dorn and KraussMaffei machines. It is purchasing new electric Niigatas or Arburgs. “We see huge advantages in process control, spare parts, preventive maintenance and more by standardizing on Arburg and Niigata presses,” Ignatowski said.

“The Arburgs are for high-speed production of the smaller parts, and Niigata can do everything else,” Ignatowski said.

He said the company researched other brands but decided on Arburgs for small parts because of reliability and cycle times. “We use the A drive, not the E drive. The A drive has a planetary gear that drives the screw and clamp and is much more robust than the E drive, which just has one ball to drive its ball screw.”

Automation Plastics runs precision molds with up to 128 cavities capable of producing 1 million to 2 million tiny parts per day with 4-second cycle times. The products frequently have holes with diameters as small as 0.008-inch, tight flash allowances, exacting tolerances (typically within 0.001 inch), threads and close-tolerance undercuts.

Automation Plastics selected Niigata presses for its larger parts because of the price and a positive history. “We specify the LP [long pressure] machines because the servo motors are heavier duty and can do longer hold times when needed for thick parts.”

Parts run on the Niigata presses range from 0.25-inch to 3 inches thick and must be void-free. Many have inserts. Sealing surfaces, orifices and mating threads are common.

“We mold a bimodal, fractional-melt, extrusion-grade material that is expected to have a good finish,” Smith said. “Fractional melt does not lend itself to smooth flow lines.” That means machining is required for some parts.

Machining capabilities include CNC lathes and vertical milling.

Automation Plastics does not have a specific schedule for injection press replacement. Tax incentives helped make the decisions on the most recent purchases. “We have one Arburg with 50 million cycles on it during the past 13 years,” Smith said.

Top, a Thermal Care central chiller system is being installed at Automation Plastics. The company touts the system’s energy-saving variable-frequency control. Bottom, the company has relocated and expanded its mold maintenance department.

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“Our company saved 4,288 employee hours a week and 3,024 press hours a week boosting capacity utilization—the savings are staggering.”

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Smith said, “We look at the press we need for the job.”

Most presses have a low-speed grinder as part of the work cell. Grinders are from Size Reduction Specialists.

Automation Plastics purchased five Ranger robots last year and expects to add more this year, including its first side-entry model. The ability to program the Ranger robots was an important feature in selecting that brand, Ignatowski said.

It also deployed a UR5 collaborative robot from Universal Robots this year to cut a gate on a thick-wall part. “It added consistency to the operation,” Smith said. “Next, I am anxious to look at using robots in the secondary finishing area.”

Ignatowski said the company is looking for new projects that can be highly automated. “Strategically, we are headed in that direction.”

Automation Plastics also plans to hire an automation engineer. “We want to have that core competency in-house,” Ignatowski said. “We won’t have a proactive approach to automation unless we have the engineer on staff.”

Smith said he thinks Automation Plastics can take projects from other molders if it can reduce labor costs through automation. “There are definitely opportunities out there.”

Automation equipment from Mac Automation Concepts is scattered throughout the plant.

Because of the high number of cycles many of Automation Plastics’ molds perform, frequent preventive maintenance is required. The dedicated team has ultrasonic cleaning equipment, as well as dry ice blasting equipment. Automation Plastics has about 250 molds.

Automation Plastics has used IQMS for process management since 2005 but is increasing the modules and IQMS services it uses. Wi-Fi is being installed in the plant to facilitate wireless bar coding and large monitors are being added throughout the plant to display production data in real time. “We are adding to the IQMS modules we use as part of the effort to make us better and more efficient,” Ignatowski said.

RJG’s eDart system is on every press at Automation Plastics. “It is a universal language for the processing technicians,” Robison said.

Nearly every press has a tablet mounted on its side with information the operator needs, including video for set-up parameters, work instructions, quality requirements and any concerns specific to the part being molded. Automation Plastics adapted Dozuki workplace collaboration software to allow it to personalize instructions for every job on each press in a video format and eliminate printed set-up books.

“I think we are ahead of our customers on using the tablets,” Robison said. “They are very impressed when they see this system.”

Automation Plastics uses both coordinate measuring machines (CMMs) and vision systems for quality control. “We are trying to do more in-process inspection,” Ignatowski said. The micro-molded parts currently being inspected with a microscope are a prime candidate for high-speed optical inspection, he said.

By the end of this year, Ignatowski said that every quality system in the plant will be completely overhauled. “This is a really a dramatic transformation for an injection molding company,” he said.

The current CMM is a Mitutoya Crysta-Apex S776 with scanning capability. The vision system is a Ram Optical Omis II Vision system that can verify molded part features smaller than 0.002 inch.

The company has a Stratasys 3-D printer and has used it extensively to create fixtures, end-of-arm tooling and some automation components. It recently purchased an option that allows printing of flexible materials.

Automation Plastics uses training programs from A. Routsis Associates and tracks each employee’s progress.

Smith did not provide many details, but he employs several recovering addicts. “We try to give them a chance to re-establish themselves,” he said.

“The traditional view is that certain people are not employable,” he said. “But if you can catch a person when they are ready to make a change in their life and provide them a support system to help them, they can be productive.”

Automation Plastics molds and machines fittings and components used in natural gas distribution for its biggest customer, Honeywell. It molds tiny aerosol spray components for its second-biggest customer, a packaging manufacturer. Smith said automotive components, primarily under-the-hood parts, currently make up about 10 percent of Automation Plastics’ business, but Ignatowski said there will be a push to expand that sector.

“In a year’s time, I expect automotive to be our largest market,” he said. “The focus will be on high-precision, functional parts.”

Automation Plastics’ current 50,000-square-foot plant can be expanded by about 17,000 square feet. “To expand, it will have to be an expansion of this plant or a new plant. Our ultimate goal is a lights-out facility.”

Smith said he cannot put a price tag on upgrading Automation Plastics, and he did not budget an amount. “In terms of payback, there is no calculation. To do it all on such an aggressive timeline is a leap of faith,” he said.

“We have spent money on a face-lift, quality systems and some new equipment, but there is still more to do in training and other areas,” he said. “We will roll out our new IATF certification in 2019. I think we will be a different company soon. I hope we can win new customers along the way.”

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