

Pressing On

Company invests in molding equipment, employees to tap new markets

By Alan Richter, Senior Editor

Dynomax Inc. is seeing strong growth in defense and aerospace orders for its micro-injection-molded products. While many companies might be satisfied with that, Dynomax wants more. It has targeted the medical industry for new business.

The Wheeling, Ill.-based contract manufacturer has made a major investment in equipment for its Mundelein, Ill., molding facility so it can better serve existing and new customers by boosting its capacity and upgrading technology. According to Tom Filippo, general manager of Mundelein operations, that includes new Arburg injection-molding machines: 110-ton electrics and 28-ton hydraulic presses.



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A worker inspects a part at Dynomax's injection-molding facility in Mundelein, Ill.

See it online

To view a video of operations at Dynomax, scan the quick-response (QR) matrix image at right, or type this URL into your Web browser: micro.delivr.com/1d4f9. (A free QR app for your smartphone is available at get.neoreader.com.)



"Dynomax's high-glass-content thermoplastic and thermoset-injection-molding and tooling operations are supported by a vertically integrated engineering and manufacturing team, incorporating the latest design process technology for mold-flow analysis," said Walter Zic, vice president of operations. "By expanding and upgrading to over 35 cutting-edge machines and utilizing cellular manufacturing and robotic machine tending, we are able to provide superior customer service and go from design to part in 3 weeks or less."

Filippo added, "We're making these investments right now based on incoming orders and our knowledge of the industry." In addition, Dynomax has hired 100 new employees companywide during the past 2 years. The new hires roughly double its workforce; the Mundelein facility now has more than 40 workers. The site runs two full shifts with some machines running unattended on the third shift, and dedicates 12,000 sq. ft. to injection and insert molding and 8,000 sq. ft. to tooling production.

Of the estimated nine million to 10 million parts the Mundelein facility produced last year, Filippo classified about 90 percent as microparts, including some with 0.003" wall thicknesses and tolerances as tight as ± 0.0001 ". "It's all about precision and control," he said, noting that Dynomax might mold a feature the thickness of a human hair from a material that is 30 percent glass. "For that type of material, we're going against science, but we're able to do it."

Dynomax primarily molds parts for the aerospace and defense industries, including specialty interconnect-system devices and grommets and brackets for cable and harness management. The company's molded product sales increased 20 percent in 2011 compared to the previous year. The increased sales are due to higher order volumes from existing customers and orders from new customers.

Dynomax produces small runs for the medical market and is actively pursuing that industry for molding and tooling, according to Mark Zic, director of business development. "We are used to serving highly demanding customers with high-precision components for mission-critical



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Dynomax

Tom Filippo (far left), general manager of Dynomax's Mundelein operations. A selection of parts produced by Dynomax.

equipment where quality has an impact on protecting lives," he said.

"We have the ability to compete," added Filippo. "The medical industry requires the same expertise and quality focus that's required in aerospace and defense. As a contract manufacturer, we can design and manufacture to our customer's specifications, so we are targeting the areas of the medical device market that can benefit from our core capabilities—high-precision and vertical integration from engineering design to assembled part."

Engineering the process

Dynomax produces molded parts made from virtually any thermoplastic or thermoset, from standard to exotic. Many of its molded parts are made from materials with high glass content, which can withstand extreme temperatures while maintaining a strong mechanical strength. It has performance characteristics that exceed similar materials in the same category, according to Dynomax.

Based on the material to be molded, the company designs and builds mold tooling in-house, including selection of the tool material to meet mechanical property requirements. For example, S-7 steel offers shock resistance and high hardness attainability—good characteristics for molding. S-7 is resistant to the high temperatures and pressures produced in the injection-molding process. Compared to other mold materials, it has higher resistance to wear and tear from the abrasive plastic material. Dynomax also uses H-13 tool steel, which

provides a high-temperature hardness level. It is appropriate for applications where portions of the tool are exposed to extreme temperatures.

To produce the tooling, Dynomax employs a full complement of state-of-the-art EDMs, including hole poppers, sinkers and wire machines. According to Filippo, Dynomax relies on the latest equipment to meet continually reduced part size specifications and ever-tightening tolerance requirements while imparting fine surface finishes. "It's all about getting that great finish; otherwise, the part isn't going to extract properly and there could be marks," he said. "We work with machine builders like us who strive to be leaders in their respective products and technologies."

Dynomax uses mold-flow-analysis software to simulate and finalize the molding process. That helps eliminate potential problems from occurring during molding, such as air trap that restricts material flow and promotes part cracking. "Any of the key characteristics that we may have trouble with during molding can all be done on our software ahead of time," Filippo said, "so we reduce the time spent working it out on the floor. It's all about making the process faster and more accurate and efficient in the long run."

Filippo noted that the company's injection-molding machines, primarily Arburs and some Engels, are standard pieces of equipment that Dynomax customizes to fit its needs. For micro applications, that typically involves modifying a machine's screw and barrel. "The smaller you get, the more control

you need over your shot," he said. The company uses screws and barrel sizes as small as 8mm and shots as small as 0.6 oz., which reportedly deliver near-100 percent accuracy and repeatability.

As previously noted, some of those machines are equipped with robots, including 6-axis robots with ± 0.0001 " repeatability. The robots move materials

A multiple-manufacturing portfolio

IN THE MICROMANUFACTURING REALM, Dynamax is known for its plastic injection molding, tooling and Swiss-style machining. But the 25-year-old company, which is ISO 9001:2008-, AS9100 Rev C- and ITAR-registered, produces an array of other products and services.

At its corporate headquarters in Wheeling, Ill., the company machines large components; manufactures, repairs and services machine tool spindles and specialty machines; provides industrial automation solutions; and offers engineering, design and materials consultation. The spindles offered include block, cartridge, multiple head, gear driven, quill, standard high-speed motorized and custom spindles unique to customers' applications. In addition to developing new alloys for specific applications, the company reports that its metallurgical department fabricates alloys and composites into useful configurations, identifies material-application problems and designs processes to provide application-specific mechanical, physical and chemical properties.

The company also builds 3- and 5-axis machine tools and other manufacturing equipment at its Wheeling plant. In addition to selling them, Dynamax machines are used at all of the company's facilities to produce parts. The company's machining services include milling, drilling, boring, broaching, grinding and finishing. Many of the machines are designed, built and run for specific customer applications. At its 42,000-sq.-ft. Lincolnshire, Ill., location, the contract manufacturer also operates machines



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Dynamax builds most of its production machines, such as these units at its Lincolnshire, Ill., facility. In the foreground, a QC inspector checks a part.

from other builders, such as a recently purchased Swiss-style machine equipped with a bar feeder.

Plastic injection molding and custom-tooling production takes place at its Mundelein, Ill., facility. There, Dynamax makes mold tools, provides first-article documentation and produces parts.

In addition, the company is refurbishing its Buffalo Grove, Ill., facility for performing part finishing, including anodizing and painting, in the near future.

The company's four facilities are within 11 miles of each other and boast over 200,000 sq. ft. of space. —A. Richter

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between machines in a work cell, perform pick-and-place operations and extract parts from molds, such as those made of fluorosilicone, a rubbery material that conventional knockout devices would puncture. "It's eliminating human error," Filippo said. "Automation gives employees opportunities for advancement and more challenging work, and reduces potential work injuries."

Filippo noted that the company will be expanding to a full third shift. "We do have the opportunity to grow, and our recent expansion has proven that we will continue to expand into additional facilities should customer needs and our business growth dictate."

For more information about Dynamax Inc., call (847) 680-8833 or visit www.dynamaxinc.com.

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