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## Forward thinkers: Skills take GW from automotive into medical

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March 16, 2010

PLASTICS NEWS STAFF



A row of standardized Motan dryers at GW's plant in Bethel, Vt.

BETHEL, VT. (March 16, 3:55 p.m. ET) -- Bethel, a small town in the Green Mountains of Vermont, is known for maple syrup and fly fishing — and high-level plastics molding, thanks to GW Plastics Inc.

GW Plastics earned a reputation as a forward-looking molder well before its decade-long transition to flip its core concentration from automotive to medical. GW was an early adopter of full automation, vision-inspection systems and the idea of “scientific molding,” using statistical analysis and technology such as in-mold cavity-pressure sensors to make sure every single part is a good one.

GW molds and assembles products for both markets today, many of them “safety-critical” components for drug delivery, minimally invasive surgical instruments, catheters and diagnostic testing and, in automotive, for seat belts and fuel-handling systems.

“On the automotive side, we like to think we’re helping to save passenger lives, and on the health-care business we’re saving patient lives,” said Brenan Riehl, president and CEO.

Major medical and automotive customers have recognized the company for quality and product design, including Johnson & Johnson’s Ethicon Endo-Surgery unit and Takata Corp. Other medical customers include Abbott Laboratories, Becton Dickinson and Co., Boston Scientific Corp. and Medtronic Inc.



Now GW Plastics has netted *Plastics News*’ Processor of the Year Award. GW prevailed over three other finalists for the award: Montrose Molders Corp., a custom injection molder in South Plainfield, N.J.; Plastikos Inc., which molds connectors in Erie, Pa.; and PolyPipe Inc., an extruder of smooth-wall polyethylene pipe based in Gainesville, Texas. (See videos about each finalist at [plasticsnews.com/video](http://plasticsnews.com/video).)

*Plastics News* presented the award March 9 at its Executive Forum in Tampa, Fla.

The judges — *Plastics News* reporters and editors — gave GW Plastics strong grades for all seven of the award criteria: financial performance, quality, customer relations, employee relations, environmental performance, industry and public service, and technological innovation.

Brenan Riehl and other company leaders said stable ownership, and professional management guided by a board of directors, built a base as strong as a Vermont mountain. His father, Frederic Riehl,

headed a group of managers and investors that bought GW in 1983.

## Born in a barn

GW Plastics runs 170 injection molding machines and employs 600 people at six plants, including operations in China and Mexico. The company generated 2008 sales of \$78.6 million. GW ranks as the 65th-largest employer in Vermont by number of employees, and 30th-largest by sales.

About 250 Vermonters work at GW plants in Bethel and nearby Royalton.

“By Vermont standards, they’re a very large employer,” said Vermont Gov. James Douglas. “What I like about GW is they’ve stayed ahead of the curve. They realized, presciently, that the automotive business might not be as robust, or might be changing, and so they got into the health-care field, which is a growing industry.”

Bill Carteaux, president and CEO of the Society of the Plastics Industry Inc., nominated GW Plastics for the Processor of the Year Award. Before coming to Washington-based SPI, he sold injection presses to GW as a top executive at Demag Plastics Group.

“GW has been advancing the state of the art of the industry long before it was popular,” Carteaux said.

He cited GW’s investment in multicomponent molding and fully automated insert molding. GW also does micromolding and thin-wall molding, runs bioabsorbable polymers and can do rapid prototyping.

GW worked closely with Demag Plastics Group, and more recently, Engel Machinery Inc., to suggest improvements in machines and controllers. Beginning with Fred Riehl, the company has insisted on standardization — even to the point of having Engel paint its presses in Van Dorn colors complete with striping, to match the existing fleet. That level of consistency extends from injection presses to auxiliary equipment to employee training.

Gov. Douglas and Carteaux both came to GW Plastics in early February to support the company during a visit by *Plastics News*. They gathered with GW leaders at the firm’s headquarters in Bethel — a distinctive building that, from the front, looks like a little red barn.

That’s precisely what it was back in 1955 when John Galvin and Odin Westgaard started molding parts, using the first letters of their last names to create the “GW.” Galvin, a World War II veteran, was a salesman for a rubber company in New Jersey when he met Westgaard, who was working as a consultant, according to Carl Symonds, who joined GW Plastics in 1966 and became general manager.

Galvin spelled out his gung-ho desire to start a plastics molding business. After some reluctance, Westgaard, who was then in his 60s, agreed.

Symonds said Westgaard, an avid fisherman, came up to Vermont to fly fish in the White River. When he stopped at a local restaurant, the owner ended up showing him a farmhouse that Westgaard bought as a vacation home. “[Westgaard’s] requirement was, if they were going to go into business, it had to be up here,” Symonds said.

So Vermont it was.

Symonds said Westgaard was well-known for his technical skills: “That was his claim to fame: pinpoint gating and balanced runner systems.”

The partners began by molding pen barrels on two presses, which were both owned by the pen company, according to Symonds. GW grew rapidly later on, when it began molding components for Gillette Co. in Boston, including the Trac II, Gillette’s ground-breaking two-blade razor. “They really taught us quality control, Gillette did,” he recalled. “We were tiny, but as far as precision goes, we were

tops. And it all starts with the design of the mold and the tool building.”

Westgaard wanted to retire, and Galvin bought him out. Later, Galvin decided to sell GW in 1973 to Carborundum Co. which, after a series of large-company transactions, became part of Standard Oil Co., known as Sohio.

Fred Riehl joined GW Plastics as general manager in 1980. He was a resin industry veteran, with 20 years at Union Carbide Corp., then three years at GE Plastics, where he was a marketing manager for Noryl polyphenylene oxide resin. He left GE Plastics for a stint at Albany International Corp., a paper firm with a small plastics business, where he ran several units.

Riehl wanted to be his own boss. “I felt that if I were going to run a company, it would probably have to be in the fabrication industry,” he said. “I had the experience. I had developed what I thought was a pretty good skill set in terms of how to make a small company prosper. But the one thing I hadn’t done was own a company.”

Sohio decided to sell GW Plastics in 1982. Sohio brought in an executive whose job, Riehl said, was to unload it as fast as possible. “It was pretty cut and dried. So I had to scramble. I had to first figure out how we were going to do it. Make an offer, and then worry about financing it later,” he said.

Riehl and the others moved fast to put together a bid. Financing was tough in the early ’80s recession, but the deal closed in 1983. Fred Riehl remains the largest single shareholder and chairman. He still lives in the area and acts as a consultant.

## Strength in management

One of Fred Riehl’s first actions was creating a board of directors, to give a voice to outside investors. The board ended up becoming a key strength, as did bringing in executives from Fortune 500 firms. Brenan Riehl, for example, worked at the plastics products division of Owens-Illinois and GE Plastics before joining GW in 1989. And there are many others.

“I’ve spent my whole life in plastics,” Fred Riehl said. “You see how professional companies run, and you’re part of that. And it rubs off, so when you come into a small company like this and you apply those same techniques, I think it’s a big leg-up.”

Brenan Riehl, who goes by the name Ben, said the company also has awarded equity stakes to key employees.

That blend of stability and out-of-the-box thinking means there is no “insular bias,” he said. “We’ve had the benefits of a closely held company and also the accountability of a publicly held company. It’s very unique. Most of my management team has worked for larger companies, from Allied Signal to General Electric to Bose Corp.”

GW Plastics also has plenty of success stories promoting from within. Dave Tabor hired on as a mold maker in the late 1960s, then rose through the ranks to eventually lead the mold-making division. Tabor founded Vermont’s certified apprenticeship program, supported by GW, which has hired many graduates, such as Jeff Tullar and Jim Voghell.

Tullar joined the engineering department, first as a cost engineer and then as a project engineer. Voghell moved to GW’s plant in San Antonio as a mold maker and was promoted to tooling engineer.

Dave Tabor retired in 2007 as a vice president, after 40 years at GW. That sort of longevity is a strong point: GW currently has 16 hourly employees with 30-48 years of service, and seven salaried employees with service of 32-44 years. Two of Tabor’s sons now work at the company.

Company officials said GW Plastics has been profitable every year since Fred Riehl led the buyout 27

years ago. Sales have increased steadily, and there was a jump of nearly 20 percent between 2006 and 2007, which Ben Riehl attributed to a broad-based acceleration of the health-care business and a good year for auto production. Sales fell back 2 percent in 2008, as strong health-care business partly offset sharply lower car production. GW did not have final 2009 sales figures available for the award judges.

GW began a geographical expansion in the 1990s, first by moving mold-making operations to a building the company owned in Royalton, a few miles from the Bethel headquarters.

GW expanded into the Southwest by opening a factory in San Antonio in 1992, to get closer to customers' automotive plants in Mexico. "We got that thing up and running and making money in no time at all," Fred Riehl said. Soon, the company needed more capacity for automotive, plus a growing medical business. GW started a plant in Tucson, Ariz., in 1996.

In the mid-1990s, the company still was an automotive-dominant molder that also did some medical. Today that mix is reversed: Medical accounts for about two-thirds of sales, and is growing rapidly. The remaining one-third now comes from automotive.

In 2005, GW made a big leap to become a global company by building a greenfield plant in Querétaro, Mexico, and buying a two-thirds stake in Chinese mold builder and injection molder Wah Chak Hing Precision Plastic Electron Ltd. in Dongguan. GW is buying the remaining one-third right now, Ben Riehl said.

The strategic shift to medical took about 10 years. It started with a series of offsite sessions. "We mapped out essentially what we thought were our core competencies, and where we thought we could add value and essentially get the best return for our shareholders," Ben Riehl said. Company officials saw that electronics and some consumer products were moving offshore.

Medical looked promising. For one thing, it's steadier than the automotive market — especially in a brutal year for car sales like 2009. "We projected health care to have pretty significant year-over-year growth. It's a market that, while it may not be recession *proof*, is recession *resistant*," Riehl said.

Medical molding can give higher profit margins, right? That's why lots of molders are eyeing the segment. Yes, of course, Riehl said. And then he repeated one of his favorite sayings: "But it's not for the faint of heart."

GW has spent millions of dollars to add seven clean room and assembly areas and hire industry experts. It takes years to make the contacts and learn the "culture" of medical.

"It's not an easy market to penetrate," Riehl said. "It's very capital-intensive. There's a lot of responsibility and accountability that comes from this marketplace. And our customers, the [original equipment manufacturers] — if you're not ready, they'll see through it very quickly."

Another force working against newcomers: Major health-care companies now are shrinking their supplier base.

Ben Riehl said there still are opportunities for the newbies, especially with small medical startups. "So it can be done, but it takes a tremendous commitment and it takes continuity of ownership and leadership. And we're a testimony to that, where our journey took about 10 years to get there."

## Quality a must

Another word you hear a lot at GW is "robust," and from a cross-section of employees. They're not talking about the newest flavor from Green Mountain Coffee, either. Robust quality systems. Robust molds. Robust supplier qualification for health care.

"It's just not a question of putting a machine in a clean room and saying 'I'm ready to go.' You need to really have exceptionally strong validation capabilities," Ben Riehl said.

That means scientific molding, GW-style, and the best place to understand it is the technology center in Royalton. After moving mold-making into the building, GW continued to invest, adding a 16-press medical molding plant, and, most recently, its first liquid silicone molding operation, with two Engel LSR machines.

The fully staffed technology center is the heart of process optimization. It includes three injection molding presses that are never used for production, so technicians can spend as much time as necessary for data-driven process development, documentation and building end-of-arm tooling. Timothy Holmes, vice president of engineering, spells out the goal: to produce a "very specific scientific molding recipe," covering every molding parameter — such as melt temperature, melt pressure, gate freeze-off — for running that mold at any GW plant.

"What we develop is a mold-specific process, not a machine-specific process," Holmes said. "We document the process and we are 100 percent confident that we can put that mold in a different press and within hours be molding the exact same part."

It starts with a high-quality, tight-tolerance mold. GW employs 30 mold makers in Royalton, and another 30 in China. Both mold shops are orderly and clean, packed with modern metal-cutting equipment — mirror images of each other, an example of standardization at GW. Royalton even has a laser machining center, which eliminates the need for electrodes and works 50 percent faster than conventional equipment.

Scientific molding relies heavily on cavity-pressure transducers inside the mold. In fact, GW requires that any safety-critical part must have pressure transducers.

"Most of our tools today are built with transducers in them," said John Silvia, vice president of manufacturing engineering and Bethel plant manager. "They either get implemented with an RJG eDart system or with an onboard Kistler amplifier built into the Engel equipment."

Silvia said GW Plastics has been monitoring mold-cavity pressure for more than 10 years. Measuring cavity pressure can pick out bad parts even before the mold opens.

GW also is a longtime user of Moldflow injection molding simulation software for mold design — a key part of an extensive review before the mold is cut. A project manager and an advanced quality engineer, or AQE, work closely with customers through the entire process.

Four-hour meetings get lampooned in Dilbert cartoons. But at GW Plastics, it's called the design review meeting and it's serious business. The AQE goes through a detailed requirements review with the customer. Then using videoconferencing, a cross-functional team that includes tooling engineers, manufacturing and process engineers and plant managers goes through a 15-page document. That document covers every aspect of the job, including photographs of the part, the computer-aided-design model, and a rough layout of the tool.

Every single new mold gets the design review treatment. "We have buy-in from all the key disciplines that are going to be running production, for the life of the program," Holmes said.

No excuses. Everyone on the same page. "We've had this system for years, and it's very unique because of the level of detail and the questions asked," Riehl said.

Customers told the *Plastics News* judges they appreciate GW's quality, service, delivery and innovation. Several big medical customers are awarding more business to the Vermont-based processor.

"They're on top of their game, and they inject ideas into our company," one customer said.

All the time spent on design, documentation and molds is important. GW backs that up on the molding floor. During a plant tour in Bethel, a 330-ton Engel press was molding a flange for a car fuel tank, with metal terminals. A robot pulled the parts out of the mold, pivoted and put in the inserts for the next shot. The work cell has three separate vision systems, one to ensure the inserts are properly oriented, a second to check the mold area and a third to check a valve. Finally, each flange moves through a final inspection station to make sure it conducts electrical current.

Work cells automatically kick out any bad parts to a special bin, or a reversible conveyor. GW also does a lot of cavity separation, where parts are deposited in specific storage bins, for traceability.

A Mattec system handles production and process monitoring. GW has greatly modified a Plastics Advisor MRP II system to integrate all parts of the operation, companywide.

The years of hard work and investment have paid off in a sterling quality record. According to Sumanesh Agrawal, vice president of quality and continuous improvement, GW Plastics recorded an annual bad-part-per-million rate of 365 in 2008. That fell to 266 PPM in 2009. The goal for this year: a miniscule 150 PPM.

If any problems *do* turn up, GW handles them quickly.

A “panic button” is one feature of Plastics Advisor. “In the event that a plant discovers that there is a problem with a certain lot of resin, they can put that resin on hold at all GW plants,” Agrawal said. “It gets put on hold right away, so that if somebody is going to use that material, they won’t be able to. It prints a hold ticket on the local printers in each of the plants, so when these people walk in, in the morning, they see a hold ticket saying this material’s on hold.”

GW also mistake-proofs using something called “scan-to-hold.” Any rejected parts that have already been boxed for shipment cannot physically leave the building, because an alarm signals when the shipping department scans a box to create a packing slip.

“It’s like an electronic leash on that product,” Agrawal said.

The system tells you which molding factories have the same raw-material lot, and how much is left in inventory. And it compiles an inventory of molded parts that GW sends to customers so they can stop using them right away.

GW started a formal Six Sigma program in 2004. So far, the company has graduated seven black belts and 18 green belts. Currently, their 10 improvement projects have generated close to \$500,000 in savings.

More recently, GW has kicked off lean manufacturing, working with the Green Suppliers Network and the Vermont Manufacturing Extension Center.

## Going greener

GW Plastics also has become a greener company — important for any corporate citizen in Vermont. Working with the Green Suppliers Network and Efficiency Vermont, GW has cut its energy consumption. It also uses regrind when possible, and sells about 375,000 pounds of material to recyclers each year.

Leadership also extends to community service. For more than 40 years, GW has donated a scholarship to one senior from four local high schools in Vermont. GW veteran Carl Symonds hands them out at graduation.

Shaun Pickett, principal at the rural South Royalton High School, said scholarship winners have gone on to get engineering degrees. Most really needed the money to afford college, Pickett said.

Ben Riehl said GW Plastics believes in partnering with its community and the state of Vermont, just like it works with machinery and resin suppliers. Gov. Douglas is just a phone call away.

“Being in a small state gives us an opportunity for a much more intimate relationship,” Riehl said. “And our voice is heard. It’s back and forth. It’s a bilateral relationship.”

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