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Plant tour: Commitment to a global standard need not be a great wall

By Stephen Moore
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When GW Plastics made the commitment to key customers to supply them locally in China back in 2006, it promised to service their precision processing needs at exactly the same level as at all its other global facilities.



The An-Li High Tech Park in Dongguan is home to GW Plastics' China operation.



GW Plastics' Bouchard (right) and Boyden emphasize the importance of adhering to corporate operating practices and quality systems, no matter where an operation is located.



Operators are few and far between at one of the leanest operations in China.



GW Plastics in Guangdong in Southern China could well be mistaken for any other of the company's global operations based on its layout, processing technology, operating ethos, and efficiency. GW operates processing facilities at four locations in the United States, including its headquarters plant in Bethel, VT, and one in central Mexico. Its China-based customers are essentially the same ones it serves in the NAFTA area—with the same quality and delivery demands. "Our customers realize the need for a global supply chain, but prefer to work with existing relationships to minimize their risk," says Benjamin Bouchard, VP, market development, international at GW Plastics.

While many processors make the long trek to China in search of low labor costs, GW Plastics' objective was to be closer to its customers. In fact, what's most notable when you step onto the shiny plant floor located in an impressive modern industrial estate in the southern Chinese city of Dongguan, just a 1.5-hour drive from Hong Kong, is the tiny number of machine operators. "Wherever possible we've removed the human variability to ensure our stringent global quality standards are maintained," says Bouchard. This translates to a facility fully reliant on robotics. Just three operators look after the shop's 15 injection machines per 12-hour shift. GW Plastics operates all-electric Fanuc Roboshot and tiebarless Engel machines at the Dongguan plant.

The tiebarless machines have two key advantages, since many of the parts that GW Plastics molds are complex and often require tooling with slides and side actions. This can result in a large mold that has difficulty fitting between the tiebars on a conventional machine. "With a tiebarless machine, we can size the press to the part requirements with less regard for the platen size—this results in the use of smaller-tonnage machines," says Bouchard. "The second advantage is ease of automation. We have 180° access to the mold for automated insert placement and part removal, for example."

Bouchard notes that, while most aspects of doing business in China are lower cost than in North America, including those associated with labor, overhead, and management, for others such as electricity and raw materials it may not be the case. "When European customers specify a European material for a particular project, much of our cost advantage disappears because we need to import it," he notes. "There's always a cost associated with shipping from overseas." If the material specification is broad, however, "we can generally source very competitive material locally." The problem with the latter scenario is that Asian compounders tend to source base resins from multiple suppliers, so there are batch-to-batch variations that can present challenges when processing parts with tight dimensional tolerances, Bouchard says.

Mainland acquisition

GW acquired its mainland processing capability through a majority-owned joint venture with local company WCH in June 2006. Founded in 1997 by Lide Zeng, WCH was a key supplier to GW Plastics for precision molds used in the production of close-tolerance parts for the automotive, healthcare, and industrial markets. Bouchard notes, "We were attracted to Zeng because of his high ethical standards, plant standardization, and obvious commitment to quality." Moldmaking capacity is more than 100 molds per year, and the Guangdong toolroom is also used as a low-cost option for GW's North American operations. GW Plastics is in the process of purchasing 100% of the JV operation.

A strong technical linkage is in place between Dongguan and GW Plastics' Technology Center & Tooling Div. in Royalton, VT. "Networked CAD workstations allow 24/7 continuous communication between GW engineers and program managers in the U.S. and China," Bouchard says. This ensures a high level of consistency.

When GW initially took up the search for a prospective partner in China, "we were frustrated to find companies with excellent tooling operations, but there were shortcomings on the processing side," recalls Bouchard. "Typically, we saw

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Engel tiebarless machines allow better press sizing and easier automation.



Dongguan's toolmaking capabilities are used group-wide.



The latest investment at GW Plastics Dongguan is cleanroom medical molding.



Ensuring the measure of things is paramount in GW Plastics' precision molding practice.



Moisture is a major concern in hot and humid Guangdong Province.



A specialized gear checker ensures quality standards are attained.

300 tonnes vs. 650 tonnes in the U.S.," says Bouchard.

GW Plastics relies on a broad base of metrology equipment to verify products are within spec. Parts such as an eye lens for cataracts that is molded for a Japanese client often need to be optically evaluated, while micromolded components need to be looked at using noncontact optical coordinate measurement machines (CMM) and a shadow graph used to measure warpage.

The Dongguan facility is also starting to take a more active role in GW Plastics' product design and development capabilities. Unigraphics CAD workstations are already in place to allow 24/7 communications with GW engineers and program managers in the U.S. on the tooling side. This augments the in-house high-speed CNC machining centers, EDM, and CMM equipment employed in its precision moldbuilding. The plan going forward is to offer customers product design and development assistance from both GW USA and GW Guangdong to assist clients with 24-hour global product design and development.

Bouchard notes that customers who have visited the Dongguan plant are impressed with it. At the end of the day, it comes down to process consistency and quality tooling, which GW Plastics considers the cornerstones of quality production. —[Stephen Moore](#)

manual takeout of parts, manual deflashing, and other human-dependent tasks that did not fit in with our mantra. Acquiring a trusted partner with a solid track record in tooling and scope to expand into processing thus made a lot of sense."

The recipe appears to have worked, with floor space tripled to 40,000 ft² one year after GW Plastics took over the facility and the number of injection machines at the plant growing from five initially to the present 15. Space is sufficient to double the stable of machines once demand climbs out of its current global-crisis-driven trough.

An added advantage of acquiring a tooling concern was that GW was not inheriting plastics processing "experts" fixed in their particular processing preferences. GW was able to bring in technical staff and train local staff in its production philosophies. "Typically, this involves dispatching trainers from the U.S. for stints of two weeks or more, but once the trainers return home to the U.S., we also need to ensure the workers continue to practice what they've learned," says Bouchard.

Enter Edward Boyden, GW Plastics' scientific injection molding manager. "My task is to make our staff true converts to the value of consistency," he says. "If we change the manner in which a process is carried out, we have to continue to reinforce that process. Otherwise, they will revert to their old ways," adds Boyden. The global economic crisis that hit export-dependent southern China particularly severely does have one silver lining in that "it is a lot easier to find good people."

7S

High on the agenda at GW Plastics Guangdong was inculcating a sense of safety. The Dongguan plant operates to Japanese 5S (seiri = tidiness, seiton = orderliness, seiso = cleanliness, seiketsu = standardization, and shitsuke = discipline), and this sixth S of "safety" is apportioned a similar importance.

And there's a seventh S at GW Plastics Guangdong, "scientific," as in scientific molding. Introduction of this technology is part of GW Plastics' global standardization policy and its Dongguan operation is one of a small number of molders in China practicing scientific injection molding (SIM) with cavity pressure sensors from RJG and Kistler and part diversion technology. According to GW Plastics, SIM is a disciplined approach to determine and control optimum process parameters so as to produce consistent quality at a lower overall cost. Strategically located in-mold pressure transducers provide constant real-time process feedback and control.

Boyden was hired to help build on GW Plastics' commitment to SIM technology in its China operation. He provides SIM training and works closely with the production team to support ongoing growth, while helping to ensure that quality, delivery, and productivity objectives are achieved.

"We use SIM for safety-critical parts such as seat belt retractor components," says Boyden. "It enables us to establish a robust process that is affected minimally by external variations such as ambient temperature and batch-to-batch variations in plastic compound viscosity. The focus is on the actual condition of the resin melt and not the machine parameters." One key objective of SIM use at GW Plastics is to balance parts in a multicavity tool to within 5% by weight. Furthermore, parts molded using SIM do not need secondary inspection as the process will automatically reject shots that are out of process specification.

GW Plastics' next major investment in its Dongguan operation came in June 2008 when it installed a Class 8 (formerly Class 100,000) cleanroom molding and assembly area, primarily to serve the medical sector. GW Plastics has the capacity to operate a total of 10 machines under cleanroom conditions and still has room for secondary assembly operations.

Bouchard reiterates, "Many of our global healthcare customers have already established production facilities in China. Most others are planning to make investments in the region. Yet many of our customers express concerns over outsourcing business in China. We have removed the risk of manufacturing in China by offering the same high level of standardization in equipment, operating practices, and quality systems as in our North American operations."

Healthcare is the largest of GW Plastics' businesses globally speaking, while electronics remains the biggest business in China, with micromolding currently seeing strong growth there. "Our presses are smaller in China, ranging up to

Vital Stats

GW Plastics, Dongguan City, Guangdong Province, People's Republic of China

Facility size: 40,000 ft²

Annual sales (2008): Approaching US\$100 million companywide

Markets served: Electronics, automotive, medical, telecommunications, business machines

Customers: Johnson & Johnson, Bosch, Takata, Samtec

Parts produced: 86.605 million (2008)

Materials processed: PC, POM, PA, PP, PPA, PE, PBT, LCP, ABS

Resin consumption: About 100 tons/year

No. of employees: 95

Shifts: Two 12-hour shifts, seven days/week

Molding machines: 16, up to 300 tonnes; Engel, Fanuc

Secondary operations: Assembly

Other services: Cleanroom molding and assembly, micromolding, product assembly

Internal moldmaking: Yes

Quality: ISO 9001:2000, TS 16949, TS 13485

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Your rating: None

Nice article. Of all the

Submitted by murph on September 21, 2009 - 12:21pm.

Nice article. Of all the plants I have been through and worked in over there many are doing it right from the start as it looks like GW is doing.

One thing though, two 12 hr shifts, seven days a week is rough. We run four shifts 12hrs on seven days and minimize OT.

Murph

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