Six Sigma: *A competitive edge*

One of the world's largest molder-manufacturers finally adopts Six Sigma. Here's why, and why you should, too.

In today's highly competitive, global economy, gaining an edge in manufacturing requires reaching beyond ordinary or incremental improvements to the radical leaps needed to be a world-class supplier. Although Six Sigma has been around for more than a decade and has been adopted by many large OEMs, a number of custom injection molding manufacturers bypassed this quality system because of its expense and complexity.

Now, some are starting to rethink Six Sigma as a way to become more productive, more cost competitive, and as a first step toward lean manufacturing. The Tech Group (headquartered in Scottsdale, AZ) entered the Six Sigma program after recognizing the need to adopt a proven quality culture that would help the company enhance its competitiveness as a global supplier to its OEM customers. In fact, two of its largest OEM customers had implemented Six Sigma, and wanted their suppliers to benefit from this system as well.

However, adopting Six Sigma requires a shift in thinking that says molding is not a black art that can be perfected by the processing wizard who magically knows which dials to tweak. Because of the variables in the molding process, using this black magic approach lends itself to "fire fighting." Although fine for fixing short-term problems, the process tends to eat up resources while offering no permanent solutions.

On the other hand, Six Sigma provides a measurable, data-driven, analytical methodology—a disciplined approach—for improving the molding process. The result is a consistently conforming product.

Start with an Ally

The Tech Group's management team realized that, to be a world-class company, it would have to do things differently. But how to change the old, ingrained culture? To start, the company's customers, who already had Six Sigma in place, invited The Tech Group to send an employee, one who was closely involved with that particular customer, to the customer's seminars on the Six Sigma approach. What the employee brought back from this training experience, says Mike Treadaway, VP of manufacturing for The Tech Group Americas, was "how their approach to solving problems had changed and how successful it was."

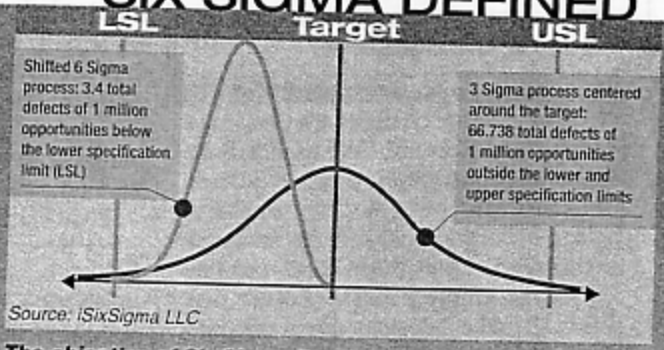
Getting buy-in from top management to begin implementing Six Sigma at The Tech Group Americas was the next step. The benefits of Six Sigma were obvious, and a consulting firm, Advanced Integrated Technologies (AIT), was selected to help The Tech Group implement the program. Treadaway notes that the selection of a Six Sigma provider is critical to the success of implementing the program.

Price should also be considered carefully. In a tight economy in which OEMs are slashing manufacturing costs, can a molder be assured that the expense of implementing such an ambitious program as Six Sigma will be recovered in the end?

"We had a similar concern about costs and competitiveness," says Mike Kobashi, director of process excellence. "During the selection process we found a [Six Sigma consulting group] we really liked, and who guaranteed that our training investment within the first year would be fully recouped in costs savings." The Tech Group estab-▶

SIX SIGMA DEFINED

For those needing a refresher on Six Sigma and its principles, here's a quick definition, courtesy of iSixSigma LLC (www.isixsigma.com): Six Sigma is a disciplined, data-driven approach and methodology for eliminating defects (driving towards six standard deviations between the mean and the nearest specification limit) in any process—from manufacturing to transactional and from product to service. The statistical representation of Six Sigma describes quantitatively how a process is performing. To achieve Six Sigma, a process must not produce more than 3.4 defects per million opportunities (DPMO). A Six Sigma defect is defined as anything outside of customer specifications. A Six Sigma opportunity is then the total quantity of chances for a defect. This process improvement is accomplished through the use of two Six Sigma submethodologies: DMAIC and DMADV. The Six Sigma DMAIC process (define, measure, analyze, improve, control) is an improvement system for existing processes falling below specification and looking for incremental improvement. The Six Sigma DMADV process (define, measure, analyze, design, verify) is an improvement system used to develop new processes or products at Six Sigma quality levels. It can also be employed if a current process requires more than just incremental improvement.



Source: iSixSigma LLC

The objective of Six Sigma Quality is to reduce process output variation so that ±six standard deviations lie between the mean and the nearest specification limit. This will allow no more than 3.4 defect parts per million (PPM) opportunities to be produced.

lished a baseline, which AIT's finance department certified. "In the first year, we invested close to $400,000 in training and our savings were twice that," says Kobashi.

Train the Troops

Following the selection of AIT as the supplier, Executive and Champion (people to carry the torch of Six Sigma) training was conducted to create a common vision within the management group. Kobashi and Dave Cano of AIT developed the program's infrastructure, reviewed potential candidates for participation, and selected a project prior to beginning the initial wave of training.

Borrowing terms from the martial arts, the candidates chosen are called "green belts" and must complete two weeks of classroom instruction and an actual project to receive certification. The next level of participation is the "black belt" level. "Black belts receive five months of instruction and are required to go into detail on the statistical tools necessary for Six Sigma in order to become certified," explains Treadaway. "The goal is to demonstrate that you can use the skills and successfully complete the project to become a black belt."

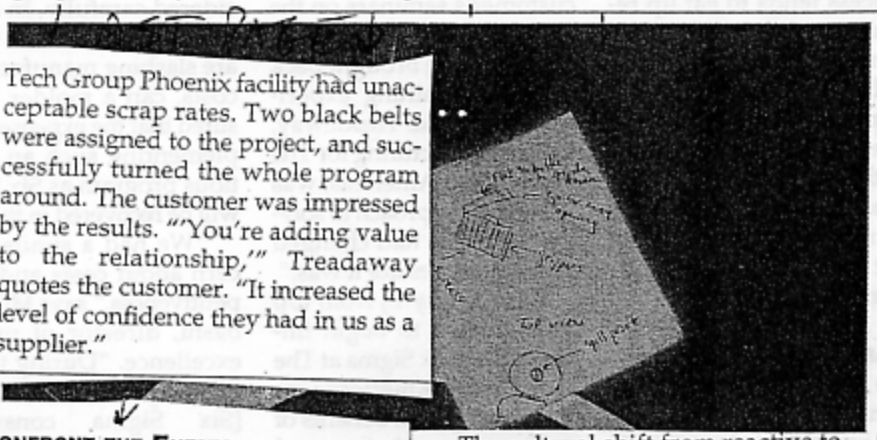
Over the past two years, there have been three waves of training. The first wave, black belt training, focused strictly on manufacturing. During this time, the participants identified areas of processing that needed to be addressed with a Six Sigma approach. One of those areas, crucial to all molders, was scrap.

"We looked at different types of scrap, not just what is usually thought of as scrap or bad parts coming from the molding press in a production run," Treadaway explains. "We looked at engineering scrap—waste that was created even before the job was OK'd. For example, we had a customer specification that the first 10 shots during mold startup were always scrap. With the data we collected we went to the customer and said 'we're going to change the specs and here's why.' In the past we've been just the supplier and the customer was always right. Now, with data in hand, the customer told us, 'You've done your homework, so go ahead and change the specs.'"

The second wave, green and black belt training, added nonmanufacturing functions such as finance, payroll, human resources, sales, and information systems. The third wave trained green belts only and included manufacturing and nonmanufacturing processes. In March, three people were scheduled to go through their master black belt training program, an intense "train-the-trainer" course that spans six months.

"Now that we've had several waves of black belts and green belts, these same people continue to work these projects, and the momentum is growing," Kobashi states. "They paid their investment in year one, while the savings are continuing to grow."

For example, one project at The ▶



Tech Group Phoenix facility had unacceptable scrap rates. Two black belts were assigned to the project, and successfully turned the whole program around. The customer was impressed by the results. "'You're adding value to the relationship,'" Treadaway quotes the customer. "It increased the level of confidence they had in us as a supplier."

Confront the Enemy

Six Sigma is for the entire organization, not just manufacturing. And it's a program that changes a company's culture. "We don't want to make this the management flavor of the month," says Treadaway. "We want to get momentum and get the data together to demonstrate an effective change in the culture of The Tech Group."

Yet, cultural changes aren't always easy, notes Kobashi. "We used to hear that injection molding is an art, a black box process," he says. "Now we have people coming back from training who realize that there is science behind the whole process. People use data to make decisions about the process and solve the problems."

Some of the battles Kobashi and the Six Sigma team faced while implementing the program involved people who've been with The Tech Group for many years and were reluctant to change. After two years, however, nearly everyone at the Americas plants are beyond the curve, culture is shifting in a positive direction, and the company is realizing a significant ROI. Currently, The Tech Group has certified 10 black belts and 16 green belts. A $337,000 investment in the program returned $1.1 million in savings.

The cultural shift from reactive to proactive problem solving and from guesswork to using analytical data requires team members to operate in a continuous improvement mode. "We don't wait for a problem to come, but rather continually look at areas where we know we can improve and find the solution before it becomes a problem," explains Treadaway. "We have to do that to be competitive. We can't have waste and stay in business. We've got people who now take a more disciplined approach to problem solving. We find a solution that really sticks."

The benefits of Six Sigma are definitely measurable at The Tech Group Americas. The adoption of common practices and terminology enables managers, operators, and engineers to speak a common language. "This approach empowers more employees to solve problems analytically, which allows managers to review the information and agree that the approach and results are acceptable," says Treadaway. "It makes everyone more effective, resulting in better performance and higher customer satisfaction."—*Clare Goldsberry*

Contact information
The Tech Group, Scottsdale, AZ
Mike Treadaway; (480) 281-4500
www.techgroup.com
mike.treadaway@techgroup.com