



Thanks to lean principles, an operator in Colonial's spline department can run three machines at once, including two CNC spline grinders and a manual grinder (courtesy of Colonial Tool Group).

Steadfast & Streamlined

CAN LEAN SOFTEN THE ECONOMIC BLOW?

Matthew Jaster, Associate Editor

Two high-volume gear production cells grace the shop floor at Delta Research Corporation in Livonia, Michigan. Thanks to lean manufacturing, these cells have never shipped a defective part to a customer since they were developed over three years ago. With the help of robotics, conveyors and an efficient organizational process, the pieces are turned, hobbed, gear ground, cleaned, roll-tested and laser marked completely hands-free. They are poka yoked and sent through a Production Part Approval Process (PPAP). Delta employees merely need

to "check-in" once in awhile on the work before shipping—typically ahead of schedule—to the final destination. Lead times were shortened and the automated assembly process has been a complete success as far as sales and project manager Tony Werschky is concerned.

These cells were put in place at Delta Research when the company expanded its lean manufacturing initiatives. They are a big reason it has been able to survive and prosper in Michigan, where the industrial and manufacturing sector has seen better days.

"Growth must be calculated and conducted in a way that prevents you from creating volatile periods in your company's business cycle," Werschky says. "Our lean programs have kept us from over-hiring, losing sales volume and then shedding employees just to survive. We have seen minimal changes in net income as a result of lean processes."

These processes have been discussed before in *Gear Technology*, where many a Publisher's Page and feature article have addressed the

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importance of lean manufacturing. Call it overkill or simply a bias toward systems that seem to work, but there's truth behind all the rigmarole. Recent economic activity, or lack thereof, has only solidified the benefits of lean.

If your organization neglected to implement some kind of lean strategy before the economic downturn, it might be in worse shape today than it needed

to be. Sure, it's been rough out there, with higher production costs and a significant drop in orders, but the companies that have actively pursued lean manufacturing seem to be in a better position than those that failed to implement these strategies prior to 2008.

How the Commitment Pays Off

"The pursuit of lean principles is more important now than ever before,"

says Jim Sonderman, consultant for the Lean Learning Center in Novi, Michigan. "Those companies that pursued a lot-size reduction strategy through faster setups prior to the economic downturn are better positioned from an inventory perspective and have less cash tied up in unsold product."

Sonderman says that focusing on waste elimination is critical, especially during times when recovery must be swift and problems should have been resolved years ago.

"Many companies are in survival mode, slashing manpower and cutting costs wherever they can just to stay afloat. They are simply trying to weather the storm without wrecking the ship," Sonderman says.

"Labor has been terribly affected. We have seen even the leanest manufacturers reduce manpower through temporary layoffs and reduced work hours to accommodate for the decline in customer demand," Sonderman says. "For most companies, it's a matter of survival. Those that have flexible workforces and processes as a result of standard work, cross-training and cellular manufacturing can adjust faster to the variations in customer demand."

Keeping a staff trained on how to identify and eliminate waste is half the battle, according to Sonderman.

"One particularly nasty side effect is the brain drain. When highly-talented employees are temporarily or permanently let go, the factory floor has difficulty with solving problems. The companies that spend considerable time and effort on coaching and mentoring all employees through structured problem solving activities are able to recover quickly, even in crisis," Sonderman says. "The companies that consider employees as simply a means to an end will be plagued with chronic problems that affect quality, delivery and cost."

While industries like agriculture and food are somewhat recession proof,



One of Schafer's many manufacturing cells are marked on the floor to maintain lean guidelines throughout the shop (courtesy of Schafer Gear).



Colonial has put two conventional universal grinders and one CNC universal grinder in the same work area as a lean initiative. A jib crane was added for ease of handling (courtesy of Colonial Tool Group).

manufacturing, particularly automotive, has been devastated from the recent economic collapse.

"Many companies are in survival mode, slashing manpower and cutting costs wherever they can just to stay afloat. They are simply trying to weather the storm without wrecking the ship," Sonderman says.

Fortunately, there are companies within the gear industry that have benefited greatly from lean. Whether it's simply faster deliveries, more organized shop floors or an overall lean philosophy throughout the organization, success stories have prevented some of the bleeding.

Colonial Tool Group, located in Windsor, Ontario, has done quite a bit of work involving machining cells to increase productivity, incorporating some basic lean manufacturing techniques into the day-to-day routine with substantial results.

"We've placed machines so one operator can utilize between two to three machines at one time, depending on the operations," says Chris Scott, plant manager. "We've also installed better hoists to make it easier and safer to load and unload work pieces."

These simple practices have tightened up many of the processes at Colonial, allowing an operator to run a CNC grinder and universal grinder at the same time. With the addition of a jib crane for ease of handling, the staff can do more in their allotted work space.

Scott says that implementing lean has allowed Colonial more flexibility for scheduling and for making faster deliveries, not to mention the reduced costs for the manufacturers.

"The economy has been very slow for the past several months and we have been working reduced hours," Scott says. "Lean has helped us with shortening our required times to manufacture."

The company deals mainly with broach and spline racks, building spindles and machines. They've been working on different lean scenarios not only to adjust to the current market, but in

preparation for the often-discussed economic rebound.

"The manufacturing processes that are used for most industries can benefit if people have an open mind to the necessary changes that must be made to increase productivity," Scott says. "Most of our employees have bought into this idea and are key to its development."

In order to present lean initiatives to the staff, Scott conducted a presenta-

tion for the proposed changes and also conducted lean groups to gain employee feedback and buy-in—the same sort of communication that has made lean a success at Delta Research and Tifco Gage and Gear.

Werschky has seen lean principles increase profitability and reduce losses by eliminating excess overhead costs, employee costs and work-center foot prints.

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Schafer Gear demonstrates how the 5S strategy keeps its work stations organized and efficient. The gages missing at this station have a replica photograph under the plexiglass (courtesy of Schafer Gear).

“Our cross-training program has allowed us to transfer company personnel from one department to another seamlessly,” Werschky says. “This has

kept us from having to layoff personnel.”

And during slow periods, the company has been able to move forward

thanks to the lean practices that were implemented years ago, like buying into new technology to cut downtime on the production floor. Capital investments in new high-speed gear grinders and hobbers, ring-loaders, conveyors and robots will allow for greater speed, efficiency and ergonomics in the near future.

“We expect these machines to be used for small- to medium-volume gear projects for electric vehicle transmission, defense work and off-highway applications,” Werschky says.

These investments will come in handy as the company anticipates increased market demand for precision gears in the next two years. Since lean methodology is practiced throughout each department, employees have the opportunity to modify existing processes when needed.

“As a short run and prototype supplier, our technicians are in constant communication with management and discuss each job prior to actually cutting chips. It’s a common sense

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approach that is in line with our quality standards, promotes employee satisfaction and saves the company money in the long run," Werschky says.

A Case for Continuous Improvement

Robert Doshi, plant manager at Schafer Gear Works Inc., says the company is not focused on any one specific lean principle, but is applying many aspects across the board.

"We've applied the principles that are needed in each area as the situation allows. As a job shop, it has proven difficult to apply lean in mass. By keeping the overall goal of improving quality, delivery times and reducing cost while maintaining a safe and healthy environment, we employ whatever tools will help us achieve our goals."

The economic downturn has given Schafer the opportunity to focus internally on customer satisfaction with shorter lead times, lower inventories and better quality products.

"It has also provided more time to streamline our processes and concentrate on our 5S program," Doshi says.

What lean ultimately provides for Schafer are the tools to become a growing, vibrant and customer-oriented company with international reach. Continuous improvement and involvement strategies include employees, customers and suppliers, and the company plans to spend the next five to 10 years providing its customer base with "what they want, when they want it and at a cost that allows both the customer and company to grow."

"We feel the lean philosophy infused in every aspect of our culture. Our processes and our people will be our strength and biggest asset," Doshi says.

Today, the company looks to its employees, the most important asset of the organization, to stand out.

"Our team's resolve to not only survive, but also shine during this time, is critical to ensuring our success," Doshi says. "We know that there is business out there and we know that we should be the one to get it."

This wouldn't be possible if the

Schafer staff was unable to embrace a team concept.

"Without open lines of communication and the willingness to forgive mistakes, Schafer would not be as strong as it is today," Doshi says. "As we learn, we share. Knowledge is a commodity that we feel grows as it is shared by our employees, and it sparks new life into areas that we thought could not get any better."

In addition to its employees, Schafer continues to fortify relationships with

both suppliers and customers.

"These relationships are open and based on win-win thinking. By making ourselves transparent, we have found that, together, arrangements can be made to allow all of us to survive," Doshi says.

While Schafer has always had a culture of continuous improvement, Doshi explains that a long term commitment is necessary to see these lean principles succeed.

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"Competitive benchmarking, visiting other lean plants, on-site assessments and lean education and training at the executive level are good places to start," Sonderman says.

"Not everything we have tried has worked. Sometimes, before getting the results we were striving for, we have tried an improvement or technique sev-

eral times in the same area," Doshi says. "By staying the course and sticking to our core values and principles, we know that we will achieve our end results."

The Lean Learning Center instructs companies to get involved in these lean programs, sooner rather than later, and urges those truly hit hard by the economic downturn to open the communication lines with employees to achieve success and longevity.

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That's not to say that a commitment to lean doesn't come with an array of challenges and a hint of skepticism.

"Companies that have been profitable because of a niche market or have been immune to competition for whatever reason have less force on them driving change," Sonderman says. "We often hear 'Why should we adopt lean?' or 'We have always been successful.' A past history of financial success does not always guarantee future success. The objective should be to get leadership to see the gap between current reality and the ideal state. You want them to discover how ugly the current situation is."

With a computerized manufacturing floor at their fingertips, Sonderman reminds companies to be creative.

"Technology has changed, sure, but the lean tool box remains the same. The steps for reducing setup times and improving workplace organization through 5S are the same."

It's the understanding of lean concepts and principles that is constantly evolving.

"Lean is not about what you see when you visit a Toyota plant. It's what you don't see that is most important. What you don't see is the critical thinking that links lean rules and principles to meaningful progress on the shop floor."

Sonderman adds that this type of thinking will take organizations miles farther than simply repackaging old ideas or adding new programs or twists in technology.

"We saw this with Six Sigma. It's simply a repackaged form of problem solving. It's a great tool if you do not have systematic problem solving in your organization, but a tool is all it is. Hopefully, many organizations now understand that lean is essentially critical thinking guided by interdependent rules and principles, rather than simply a collection of tools to implement."

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Schafer are keeping busy—with vested interest in the future of U.S. manufacturing—and seem to have gotten the message regarding lean.

“Our persistence has shown that lean is not a passing fancy. It is inevitable,” Doshi says. “Although at times it can be implemented as a survival tool, we see it as a thriving tool, a shift in paradigms.”

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