

more “lean,” less leadtime at Gleason Cutting Tools

A “Lean Transformation” is underway on the shop floors and in the offices of Gleason Cutting Tools’ facilities worldwide, which is changing the way the company designs and manufactures its many types of gear cutting tools.

Bob Phillips looks just a little too calm.

After all, as the newly-appointed senior vice president of Gleason Corp.’s tooling product group, Phillips has a tough job trying to meet what has reached record global demand for the company’s gear shaping and hobbing tools, bevel gear cutters, and CBN and diamond grinding wheels. The industry averages about eight weeks for deliveries on most of these types of tools, so Phillips should be under considerable pressure. The Gleason Cutting Tools facility, in Loves Park, IL, is modern and productive, but even so, one might think it would be bursting at the seams to keep up with demand.

“That’s the conventional model,” says Phillips. “In years past, we certainly would be working harder just to keep up with the increased demand. Now, we’re just working smarter—and faster.”

For example, the Loves Park facility reduced lead times for shaper cutter orders in 2004, from an average of 31 days in January to an average of 20 days in December (Fig. 1). This occurred even in the face of rising demand. Shipment data for the company’s hobs, bevel gear cutters and CBN and diamond grinding wheels show similar improvements, Phillips says.



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Of course, most in the gear tool industry would be ecstatic with these results. But Phillips says Gleason can do even better. “Our goal is to achieve two-week turnarounds on orders for all of our products,” he says. “And we’re close to developing and implementing the system that will accomplish this.”

Get lean, go faster

Substantially reducing lead times at Gleason seemed daunting when the initiative began in early 2003. After all, how much more efficient could the Gleason facility get? The company had already invested heavily in advanced CNC machinery for both soft and hard machining. The latest technology for heat treating and the application of all the new coatings were already up and running productively. Short of spending millions more to add capacity, just how were Phillips and his group going to reach their goal of a two-week delivery?

“Here we were, like everyone in our industry, quoting deliveries of six weeks or more on products that take only about 10 hours to manufacture,” Phillips says. “Ninety-five percent

of the time was time waiting in queue. We knew that if we could improve our flow and efficiency, we would ultimately increase our capacity, while at the same time reducing the inherent expense of having excess work in process. The key was a company-wide commitment to embrace the concepts of lean manufacturing.”

One of the ultimate objectives of lean manufacturing is to eliminate the costly time wasted while product waits to be worked on. In a lean factory, actual usage by a customer is the driver that creates a demand on the factory to build only the amount of product required. As a result, smaller batches of product flow more swiftly through the factory and reduce waiting time and work in process by an enormous factor. A lean factory is like a small-diameter oil pipeline that can deliver as much volume per minute as a much larger pipe carrying a bigger volume of oil simply because the oil is moving more swiftly in the smaller pipe. As a result, less oil—or work in process—is required in the pipeline to deliver the same results.

At Gleason Cutting Tools, Phillips and his group initiated a lean manufacturing system on the shop floor fashioned on the “pull” or Kanban system, which essentially helped create the smaller pipeline. “We used to have a lot of material queued at each of the key work centers,” Phillips says. “Now we have only enough material queued up to fulfill the request for product from the following operation. That following operation, then, is producing what’s requested by the next operation and so on, all the way up stream through heat treat and hard machining. This ‘pulling’ of product in a continuous flow from the preceding operation only as needed to fulfill the customer’s requirements very quickly reduced our work in process and wait time. Now, product spends only about 10 days in process from cutoff to shipment.

“The difference is now we have our backlog and primary queue positioned at cutoff—the first operation in the production process, where bar stock for a given tool is cut to the desired length. Our capacity has been increased, and our backlog decreased, with virtually no impact on shop floor or office operations. Instead, we reduce the backlog prior to cutoff.”

In addition, lean manufacturing tools and processes have been used in an office initiative at Gleason Cutting Tools to ensure that each new order, including engineering, is completed just 36 hours from the time the order is received.



“That means at cutoff, ready to go,” Phillips says. “In the past, we would wait to process orders in batches due in large part to the system and practices we were operating with at the time, and this could take upwards of two weeks. Now we’re ‘pushing’ orders through the office to cutoff, where they wait for the pull triggering system from the shop floor.”

Kaizen, Commitment, and Other Useful Tools

Phillips is quick to point out that all this sounds a lot easier to implement than it really is. Lean manufacturing is not for the faint of heart, he says, because first it requires a continuous, company-wide commitment to accept this new way of doing business. “We constantly stress that this is not a fad or phase,” he adds. “We are doing everything in our power to ingrain lean into our business—every day, every shift, every meeting, every decision needs to have at its core this relentless pursuit of driving out all non-value-added activities.”

It also requires that an organization approach problems in novel and creative ways. At Gleason, this often means using Kaizen events or “blitzes” to stimulate out-of-the-box problem solving. Kaizen literally means “continuous improvement” in Japanese. It is an intense, rapid improvement approach involving small, cross-functional teams that, over the course of just a few days, work through a problem in pre-defined steps. The results, claims Phillips, are often nothing short of amazing.

“In a recent Kaizen blitz, we tasked a Gleason team from around the world with finding ways to improve a particular product’s performance in the marketplace,” says Phillips. “At the end of five days, we had established two extremely viable solutions. One was a methodology to reduce cost in order to stay competitive and regain market share; the other was a completely innovative new approach that will likely result in a revolutionary new Gleason product in production in the near future.”

Kaizen events will also be useful as Phillips and his team tackle the next frontier in the war on waste, and their efforts to get even leaner. This will be setup time—or the time wasted between when a machine produces its last good part and completes the first good piece of the next order. “If we can reduce this by 50%—maybe a total of 5–6 hours per order—now you’ve realized a significant cost reduction,” says Phillips. “And I think we can.” ■

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