

LEAN MANUFACTURING

Processing Buzzword or Operational Lifesaver?

by Bridget Mintz Testa

Greater profits, improved productivity, reduced costs—lean manufacturing sure has lots of sizzle. But what's the source of that sizzle—steak or ground beef? In other words, is lean manufacturing just another business buzzword, or is it something you should be implementing at your company?

“Lean manufacturing is removing everything that adds cost, not value, from the customer's point of view, like producing a high quantity of material before it's needed, duplicating work, or moving materials around,” says Dan Cumbo, research associate and faculty member at the Center for Forest Products Marketing & Management at Virginia Polytechnic Institute & State University (VPI), Blacksburg, Va. “It is simply a way of doing more with less. In this industry, materials can be 75 percent of production costs, so lean teaches us to see waste in areas like excessive inventory.”

But what about Six Sigma, Total Quality Management, statistical process control, just-in-time production, zero defects, customer-driven inventory, and other methods by various names that have received lots of attention and devotion—how does lean compare to these?

“All of these philosophies have one common goal: improvement,” says Krassimir Totev, the wood products project manager at Mukilteo, Wash.-based Washington Manufacturing Services (WMS), a nonprofit manufacturing solutions organization affiliated with the National Institute of Standards and Technology Manufacturing Extension Partnership (MEP). “They differ in their methodology and tools, but are perfectly compatible with each other.” At WMS, where 55 percent of all consulting during the last three years has focused on lean manufacturing, Totev says, “We have selected the lean approach because we believe that it gives the quickest impact on the bottom line.”

Earl Kline, a professor in the Department of Wood & Forest Products at VPI, expresses it this way. “Lean manufacturing is like using a shovel and a rake to clear the waste away,” he says. “The other methods are like the dustpan—they are more specific, more fine-tuning. Starting with those without going through the general principles of lean will discourage people. Lean is the most successful method, based on its record in other industries like automobiles, aerospace, and pharmaceuticals.”

Unfortunately, lean doesn't have much of a record in the forest products industry. The method had its birth as the famous Toyota Production System in Japan following World War II. Cumbo says, “It filtered into the auto industry in the 1970s, then into aviation, and then everything else. The wood industry is just getting it now.”

Philip Bibeau, executive director of the 415-member Wood Products Manufacturing Association (WPMA), Westminister, Mass., “guesstimates” that perhaps 10 to 15 percent of wood products companies are involved with lean manufacturing. He bases that on the number of companies—both primary and secondary manufacturers—asking the WPMA for information about the method. “Some companies are very advanced. Some still think it means watching your diet,” he says.

Why has the forest products industry lagged so far behind other industries in its adoption of lean and what's changed to make lean important? According to Bruce Lippke, director of the University of Washington's Center for International Trade in Forest Products (CINTRAFOR), the simple answer is that significant foreign competition didn't exist prior to the 1990s. Lippke says, “Lean manufacturing is so important in the US because of the currency rate, which makes our products expensive, and because of a big shortage of the wood supply in the beginning of the

1990s. That ran up prices around the world and brought out new sources, especially in Japan and Europe, that didn't exist before." Just as Detroit responded to foreign competition in the 1970s by getting lean, so the wood industry is responding today.

One such company is Hardel Mutual Plywood Corporation of Chehalis, Wash. General Manager Emmanouel Piliaris hooked up with WMS through Terry Kerwood, managing director of the Engineered Wood Research Foundation (EWRF), an affiliate of APA—The Engineered Wood Association.

Kerwood had become interested in lean manufacturing and took WMS's "Lean 101" workshop. "I saw how it had worked in secondary wood manufacturing," Kerwood says. "As the director of EWRF, I thought the engineered wood industry would be interested." Kerwood came up with the idea of doing a pilot project with an APA member—Hardel, as it turned out—evaluating the results, and then, assuming the pilot project was a success, promoting the lean approach to other members of the association.

The Hardel project focused on the two \$2 million veneer dryers at the mill, each of which had to be shut down for ten hours each week for cleaning. The shutdown cost money and time, and thus the cleaning process was a prime candidate for the lean approach.

Piliaris says, "We got the workers together with one person from management and spent a few hours going through the entire process—how to shut the dryers down, how to clean them. They brainstormed. They got a video-recorder and taped the cleaning. Five jet tubes had to be changed each time, and one improvement was to get the tubes from the shop beforehand instead of having to go to the shop and come back. That saved a half hour. Basically, we organized the cleaning tasks better, so that if we needed maintenance or parts, it was all arranged beforehand." The result was a reduction in cleaning time from ten to four hours for each machine per week, saving \$120,000 to \$130,000 per year.

After this project, Hardel embarked on reducing the load on the siding and sanding machines in the finishing department. Piliaris says, "We have one siding and one sanding machine, and they operated two shifts per day. By getting the workers together, organizing the tasks, and arranging everything ahead of time, we went to just one shift per day. We're saving on maintenance, operations, and people." The two employees who operated the machines on the second shift were relocated to other jobs. Total savings for this project represent \$150,000 to \$200,000 per year, Piliaris estimates.

Hardel continues to look for—and find—other lean opportunities. Piliaris said the company has reduced energy usage and costs through lean, and he is also bringing WMS back to help make improvements in the mill's maintenance department.

While Piliaris stresses the savings lean manufacturing produces, Steve Swanson, CEO and president of the Swanson Group, Glendale, Ore., emphasizes competitive benefits. "Being an independent and being a fairly new landowner, we don't have access to cheap natural resources," he says. "Therefore, we must be a low-cost manufacturer. Without lots of resources, we must improve our manufacturing processes."

Swanson Group entered the plywood business in 1993. Swanson says, "We had already watched the erosion of the plywood market share compared to OSB. We realized from the beginning that we had to be more competitive with OSB. We had to pay close attention to the correct products to manufacture. We'd rather make a small volume of a product with a high profit margin than vice versa, so we targeted the high profit margin products."

In 1999, Swanson decided to seek a more systematic, formalized way of maximizing productivity and competitiveness. The company brought in Perforex (Bellingham, Wash), a consulting company specializing in lean manufacturing and the wood industry.

"From the start of the process, we took measurements using time and motion studies to find the optimum production levels for each product," Swanson says. "For example, you must know the optimum level of production for 3/8-inch and for 1-1/8-inch panels. You can't achieve the same level for both."

Once the production targets were established by design teams that included both employees and management, implementation began. Swanson says, “We knocked down barriers—the quality of the material purchased, mechanical problems, organizational problems, physical arrangements, personnel issues. For example, if a product turns a corner five times a day, it stops an employee for a minute. Usually the employee notices these little things, not the supervisor. Big things get fixed immediately, smaller things don’t. If I had one defective panel in 300, people may think it can’t be fixed. But get people together, and it can be.” However, a comprehensive strategy is essential to detect all the opportunities for improvement, even the small ones. “Without a formal process in place, even the employee doesn’t notice the little things,” Swanson says.

Employees were held accountable for production levels. “Once you set a target,” Swanson says, “you must continue to ask why when you don’t achieve it. It’s about making people accountable for results and giving them the tools they need to achieve the goals.”

Through the comprehensive, formal processes of measurement and continuous improvement, Swanson says the design teams identified both the best mix of products and the individual product quantities that create the highest profit (not just sales) per press-hour—the presses being the primary bottleneck at the mill. The company tracks market changes and adjusts its product mix and quantities accordingly. Productivity has increased, and throughput has gone up by 20 to 30 percent. “We determine the correct product mix to be a viable plywood manufacturer in a tough market,” Swanson says. “We do this while providing a top-level wage and benefits package. We don’t believe in making a living on the backs of our employees.”

Lean might seem easy to adopt and implement, but appearances can be deceiving. “Technical problems are not the greatest impediments—people are the largest impediment,” says Rubin Schmulsky, an assistant professor in the University of Minnesota’s Department of Wood and Paper Science. “Adoption of lean concepts requires buy-in of the management and production teams. There is often a large amount of inertia that must be overcome for a company or a factory to change direction, apply new concepts, expand into new markets, or make other strategic long-term changes.”

Impatience is another problem. VPI’s Earl Kline says, “Failure occurs when management tries to force change, and the employees resist. You must let the ideas come from the people on the plant floor—this empowers them to self-management. Even when an event is successful, you can have backsliding. It is hard to unlearn the old before learning something new.”

Krassimir Totev identifies another aspect of impatience. “Most companies tend to proclaim themselves ‘lean’ after the experience of only one project, before lean company culture, sufficient training, designated lean champions, and clear improvement strategies are in place. They have trouble maintaining the program because they have no strategic approach.”

Then there is the matter of jobs. Kline says, “Many employees come to a lean event with a large sense of skepticism and distrust. They wonder if they are going to be fired, and they are scared to suggest improvements for fear of losing their jobs.” Dan Cumbo adds, “The environment must be safe for the employees and management to be committed. The knee-jerk reaction for management is to ‘re-engineer’ and get rid of people who won’t change fast.” Cumbo also says that many companies prefer spending money on a piece of equipment for instant gratification rather than taking the time needed to master lean strategies.

While lean definitely costs money to implement, the savings usually outweigh the costs many times over. Totev and WMS have identified many improvements and savings generated by the typical ongoing lean program. Here are just a few:

- Reductions in downtime for both production and maintenance
- Reductions in changeover times by as much as 70 percent
- Increases in productivity and throughput of as much as 50 percent
- A savings of five to 20 times the cost of a one-time lean project.

In the wood industry, where products sell largely on price, lean manufacturing offers a way for North American companies to compete with foreign producers by becoming more efficient. Schmulsky says, "Companies that are too small or too obstinate to adopt concepts of lean manufacturing have largely gone out of business or are on their way. Lean manufacturing is the only way we can retain an edge in this industry."

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