
Lean Manufacturing Clears The View At Custom Windows

Mike Peterman, Florida MEP

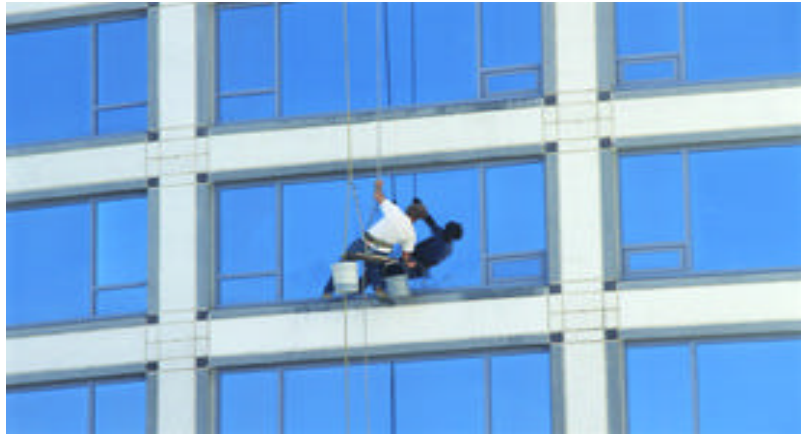
The latest improvements in ProcessModel have made it an excellent tool for enhancing lean manufacturing, which strives to eliminate eight wastes: overproduction, motion, inventory, waiting, transportation, defects, underutilized people and extra processing. Lean manufacturing targets non-value added activities — the same activities that contribute to poor product quality, and lean-manufacturing concepts would change Custom Windows.

Custom Windows is a business not unlike many others. The company is a young, aggressive manufacturer of custom windows, doors, and vinyl porch window products. Business is booming, and the company has seen a steady, promising yearly growth rate of 25 percent for the past five years.

Problem

Due to its impressive growth, the company needed to expand the facility from one plant to two and wanted to do it in the most efficient, cost-effective manner possible. John Cwik, Custom Window's president, employed the help of the Florida Manufacturing Extension Partnership, whose mission is to help manufacturers become more productive, profitable, and competitive.

Armed with the lean concepts learned during their Florida MEP



training, the Custom Windows staff was ready to participate in the process simulation-modeling phase of the project. Cwik defined the following rules for the project: Production output was to increase by 25 percent, shifts were to remain at 40 hours per work week and capital equipment could be purchased.

Models were constructed for each business unit. After the models were built, each was validated to determine if the simulation model accurately represented the process. Custom Window's staff then watched the simulation animation. Bottlenecks emerged but, surprisingly, not where they were expected. Prior to simulation, supervision had a hunch that a key bottleneck existed at a cutting operation, and that replacing the saw would significantly increase output. Supervisors had seen the advertisements and knew exactly the saw they wanted and needed — and it would cost \$70,000. They were waiting for the process simulation to verify the need.

The simulation clearly demonstrated

At A Glance

Problem:

Custom Windows needed to expand their facilities from one plant to two and wanted to do it in the most efficient, cost-effective manner possible.

Solution:

Models were built and lean manufacturing concepts were implemented in the process that included:

- 1) Unbatching all operations.
- 2) Creating a flow line for eliminating movement and handling time.
- 3) Flowing one window at a time.
- 4) Eliminating sorting operations throughout the line.
- 5) Adding three employees to the production process.
- 6) Doubling the capacity of the glass washing operations.

Results:

When the baseline model was built in ProcessModel, the weekly output of 1,945 windows was being met at full-production capacity. After lean manufacturing principles and simulation modeling techniques were incorporated, the weekly output increased to 2,400 windows.

that the saw wasn't creating the bottleneck. Cwik was thrilled he hadn't purchased the wrong piece of equipment; already, simulation had saved the company \$70,000. Custom Windows saw that the business process bogged down in the handling of the windows. Due to the batched manufacturing process, inventory at the plant was large and lead times were long.

Solution

Several lean manufacturing concepts were implemented in the process simulations that incorporated a variety of what-ifs. Changes to the baseline model (what-ifs) included:

- 1) Unbatching all operations.
- 2) Creating a flow line for eliminating movement and handling time.
- 3) Flowing one window at a time.
- 4) Eliminating sorting operations throughout the line.
- 5) Adding three employees to the production process.
- 6) Doubling the capacity of the glass washing operations.

Based on the results, Custom Windows decided to implement two one-piece flow production lines in the glass division, replacing the current batch-process single line. Using ProcessModel, Custom Windows discovered its former process paradigm was entirely off. Staff had thought batching was the key to efficient manufacturing. But after incorporating process simulation and lean manufacturing techniques, they changed their entire manufacturing process and plant layout design. Incorporating these steps into the model broke the constraints of the process and met the goals.

Results

When the baseline model was built in ProcessModel, the weekly output of 1,945 windows was being met at full-production capacity. After lean manufacturing principles and simulation modeling techniques were incorporated, the entire weekly output increased to 2,400 windows.



Even better, because Custom Windows will switch to a one-piece flow design, no new capital or investments will be required; 2,000 feet of floor space has been saved for future expansion; and the 40-hour work-week will remain intact. Money will be saved in plant operation, storage and facility use. Lead-time will be reduced, increasing customer satisfaction and increasing orders. The inventory will be decreased because of one-piece flow design. And the employees will be utilized more efficiently, saving dollars and increasing employee satisfaction.

Find Out More

About The Author:

Mike Peterman is a field engineer at the Florida Manufacturing Extension Partnership in Venice, Florida. He has more than twenty-one years of experience in manufacturing management, process engineering, and quality engineering. He is a Certified Quality Engineer and a Certified Mechanical Inspector. Peterman earned his degree in Information Systems at Prescott college. He develops business simulations using ProcessModel for all types of manufacturing and other processes, and develops supplier process improvements.

Florida MEP is part of a national organization, the Manufacturing Extension Partnership. MEP, a nationwide network of not-for-profit centers in more than 400 locations nationwide, has the sole purpose of providing small- and medium-sized manufacturers with the help they need to succeed. The centers, serving all 50 states, are linked together through the Department of Commerce's National Institute of Standards and Technology.

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