



# Setup Reduction & Quick Changeover

## Setup Reduction Pays Off for WI Companies

In today's hyper-speed economy, time is money. On the shop floor, that means the amount of time employees spend setting up a machine to run a new batch or order is more important than ever. Wasted minutes and hours—over the course of weeks and months—can take a big bite out of corporate profits. That's why a growing number of Wisconsin manufacturers are adopting setup reduction and quick changeover techniques. The money-saving techniques are a tool of lean manufacturing, which focuses on eliminating waste in manufacturing operations.

### Reduce setup time by 50% on the first pass

"By shaving minutes and hours off setup times, manufacturers can see dollars drop to the bottom line," says WMEP's Dick Welsch, a manufacturing specialist and setup reduction expert. "It's not uncommon to reduce setup time 50 percent on the first pass. Once employees learn the techniques, they can apply them again to achieve even greater savings," he adds.

Setup reduction also delivers other benefits such as shorter lead times, higher productivity, increased capacity, greater flexibility and fewer defects. One Milwaukee-area manufacturer used setup reduction to increase capacity, and potentially avoid the purchase a \$1 million piece of new equipment.

### Five Steps of Quick Changeover:

1. Setup reduction concepts are explained to a group of employees.
2. Each setup activity is timed and documented with a stopwatch and/or videotape.
3. The videotape is shown to employees. Video is effective because its an unbiased view.
4. Setup activities are analyzed and separated into two categories, internal and external.
5. Standardized operating procedures are developed to implement the improvements.

### Miniature Precision Components, Inc. (MPC)

A good example of setup reduction savings can be found at Walworth-based Miniature Precision Components (MPC), Inc.

Brett Toberman, injection molding manager, said the company stands to save \$200,000 a year as a result of its setup reduction project with WMEP. "The ROI was substantial," he said, noting that the company got far more bang for its buck with the relatively low-tech project vs. high tech tools on the market. MPC reduced setup times in its oil cap molding area from about 2.5 to 1.5 hours.



# Quick Changeover

MPC, a past winner of Wisconsin Manufacturer of the Year, is a supplier of molded and extruded thermoplastic components and assemblies for the automotive and commercial industries. MPC wants to reduce machine down time and rev up production output capacity to avoid the purchase of new equipment. Another key driver is the ability to respond quickly to customer change orders.

"Being flexible is the key – now more than ever," Toberman said. "The days of 'put the mold in and let the machine run for a week' are long gone."

## Common Sense

Setup reduction projects don't require a significant investment, and can be accomplished in a matter of weeks. "A lot of this is common sense – like don't shut down the existing job until you have all things you need for the changeover," says Toberman. MPC's project increased machine capacity, cleared out a backlog and improved setup times dramatically. There was a strong improvement in product quality, and in the flow and delivery of product to subsequent processes.

Setup reduction is based on a concept pioneered by Toyota called single minute exchange of die (SMED). The concept seeks to reduce setup times to minutes in all types of manufacturing and assembly. Industry statistics shows that 38 percent of manufacturers rank quick changeover techniques "extremely effective."

## Think pit crew

Ever watch the pit crew at the Indy 500? The well-orchestrated efforts of those individuals may seem far removed the shop floor, but the principles involved

are similar. So much so that WMEP's setup reduction video features championship auto racing and is called "The Winner's Circle." "That's something employees relate to," says Welsch. "Basically what you have is the changeover of a car several times during a race. Whether you're in the pit or on the shop floor, you need to be prepared, have an action plan and an organized workplace."

## Five Steps

Here are the general setup reduction steps which MPC followed:

- ▶ **Step 1:** Setup reduction concepts are explained to a group of employees, which can include designated setup personnel, equipment operators, material handlers, supervisors, maintenance staff and schedulers.
- ▶ **Step 2:** Each setup activity is timed and documented with a stopwatch and/or videotape. On videotape, a clock ticks on the screen to show how many minutes each task consumes. Measurements record the amount of walking around there is in the setup area. Once the data is collected, it's put in a bar chart format, an easy way to see the most time-consuming elements. Typically, the longest times on the chart offer the best opportunity for improvement.
- ▶ **Step 3:** The videotape is shown to employees, who are often surprised at what they see. Video is effective because it's an unbiased judge. When employees watch the video, they can see for themselves where time is wasted and see where things can be improved.

# Setup Reduction

**Example:** One changeover on MPC's video identified 6 specific areas for improvement that totaled 38 minutes—a reduction of overall setup time of 37 percent. Examples of time savings include eliminating searches for equipment, tools and cleaners. Point-of-use storage of tools can be a big time saver.

- ▶ **Step 4:** Setup activities are analyzed and separated into two categories, internal and external. Internal refers to tasks that must be performed when the machine is shut down. External tasks can be performed while the machine is running. The goal is to streamline the internal elements as much as possible to shorten the time the machine is shut down and not producing. The streamlining process is then applied to external elements.
- ▶ **Step 5:** Standardized operating procedures are developed to implement the improvements. Employees repeat the process to fine tune it and achieve additional savings. That's really key to being able to consistently achieve the goals of cost reduction and increased capacity.

## About WMEP

WMEP is a private, nonprofit consulting organization committed to the growth and success of Wisconsin manufacturers. A leader in Next Generation Manufacturing, WMEP brings best practices to Wisconsin firms to help them achieve world-class performance through innovation and transformation. WMEP receives financial support from the Wisconsin Department of Commerce, and partners with many public and private organizations to serve Wisconsin manufacturers.

**To learn more about Setup Reduction & Quick Change-over,  
call WMEP at 1.877.856.8588.**

