

Setup Time Reduction
Eliminating the Transporting and Trouble in Your Setup
Part VII
By Jerry W. Claunch

Last month's article examined the twelfth and thirteenth steps in setup time reduction (12) Eliminating transporting and (13) Eliminate the trouble during setup. This month's article continues this important series with eliminating tape measures and dial indicators and making the setup one touch.

Step 12 - Eliminating the tape measuring and dial indicating during setup.

As I work with companies in reducing setup time, I observe the use of tape measures, scales and dial indicators during setup. Many times, tape measures and scales are used to verify the length of cutting tools from the holder as well as verifying the positioning of fixtures. Dial indicators are used to position fixtures, indexing heads and other items during setup.

Based on my experience, I have concluded that the use of tape measures, scales and dial indicators are not efficient in setup and lead to poor start ups. The measuring tool combined with the operators method of use, sight and mental calculation leads to many opportunities for errors. My recommendation is to discontinue their use for setup. Just think how many times you have taken a measurement and then cut the board to the wrong length? People who use tape measures for a living follow the rule "measure twice cut once". Still we expect employees to use those same tools and get exact positioning during setup. Tape measures, scales and dial indicators are used inconsistently, read improperly, and are time consuming to use.

A better method would be to use hard stops, locating devices, positioning pins or other known positioning device. For example: with Computer Numerically Controlled machining, if cutting tools can not be pre-set, you could identify a location on the fixture or make a known block placed on the table of the machine tool and touch off the cutting tool. This would be faster than measuring and is more exact. Another solution may be to install dowel pins and bring your fixtures and indexing heads up to that known position to eliminate dial indicating.

Proper labeling of change parts will also eliminate the need to measure those parts every time they are used. If you have many change parts that vary slightly in size (inside diameter, outside diameter, length, etc.) you should permanently label those parts so they never have to be verified again with any measuring device.

Far too often, I observe operators having to measure raw materials during the setup. This is a waste of time especially when you realize that someone prior to the setup had to determine if this material was acceptable to be issued for the job. This takes place after your receiving inspection checked the material as well when it came into your facility. A good practice to install is that the first time material is verified for any dimension, the material should be identified with that dimension to eliminate the need for future

measuring. In working with your suppliers, you may be able to have them identify the material before it gets to your facility. If you consider all the time spent measuring in your plant, I'm certain you will want to eliminate as much as possible the measurements especially while your machines are stopped for setup.

Step 13 - Making your setup one touch.

When you consider making your setup reliable, rapid and repeatable, your goal should be "one touch". One touch means that with one motion, part of the setup change is made. For example, use one touch instead of loosening, moving, tightening and re-adjusting during start up. While this may seem impossible to you today, it may be easier than you think. If you have known positions, and repeatable settings, you may be able to achieve one touch sooner than you think.

Standardize clamping height and position.

For most of you, your production quantities are one or a very small lot size. Still, you could standardize clamping heights and clamping locations by mounting your fixtures on sub-plates. This applies to modular fixturing as well.

Alternate methods of clamping

There are numerous ways to clamp without bolts and nuts. Pneumatic clamps, hydraulic clamps, vacuum clamping, and magnetic clamping are just a few. Your goal should be to develop clamping methods that require one touch to position the clamp and activate the clamping power such as a pneumatic valve lever for pneumatic clamping, and hydraulic clamping, or electrical power supplied to activate magnetic clamping. Most of these methods can be disconnected from the air or electrical source with fail safe clamping.

Infinite adjustments

Most machine tools, fixtures and gages are made to be infinitely adjustable by the manufacturer. This infinite adjustment causes your setups to be longer than desired. In your examination of current setups, you may find there are many ways to make your machines, fixtures and gages one touch setup. Fixed positions, hard stops, location pins are all possibilities for improvements.

One system of locking a base plate onto a machine involves the use of mushroom location pins and a locking device that resists stress forces in X, Y and Z axis. It is mistake proofed and one touch to install. Figure 7-1 shows this locking system. Figure 7-2 shows another locking system that is designed to be one touch when only X and Y axis stress forces are involved.

One way to determine if your one touch improvements are successful is by conducting start up audits. This audit should include baseline settings and positions which are verified during the start up. You will find that many of the steps completed during the changeover can be improved through one touch. I have experienced all the excuses why not to make a one touch improvement and caution you not to become stymied by them. Here are a few:

"We don't need to make it one touch because . . . "it only takes a few seconds anyway."
"It doesn't take that long with the existing method of setup." "I have to wait anyway, so why make this part of the setup faster." "That improvement won't work at this plant." "It costs too much to implement one touch." "Management won't support it." "Why spend the money to reduce this part of the setup?" Many one touch improvements implemented today are a result of brainstorming sessions during which some participants said it couldn't be done. It is worth the time and effort to make as much of your setup one touch as possible.

Once you develop one touch improvements to your Setups you need to make the necessary changes to your setup procedures and documentation. Never assume everyone understands the improvement, and certainly don't expect employees to do the setup correctly without training.

The next article will be the last of this series and will deal with the cost justification of the improvements to your setups. You will see a method to conduct return on investment for setup time reduction improvements as well.

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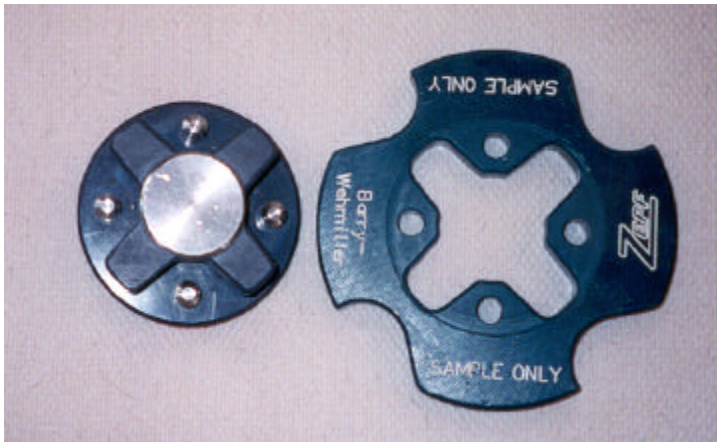


Figure 7-1



Figure 7-2