



Machining

Workflow Hacks for Job Shops: How to Move Parts Quickly

Kip Hanson | Nov 12, 2019

The pressure to remain competitive in manufacturing never stops. These workflow hacks will help shops get ahead by gaining more time back in the day from the right shop organization, maintenance standards and tooling systems designed to compress hours into minutes.

Manufacturers large and small are faced with this same situation every day. How do you get your parts to market quickly? It depends on many factors, including having a marketing plan, social media exposure and a decent website.

But when it comes to managing a job shop, you're probably concerned with only one thing: moving parts out the door as fast as possible. It improves cash flow, reduces work in process and keeps customers happy.

Whether you're making someone else's products or designing and manufacturing your own, the ability to turn parts around quickly is important to remain competitive. The traditional, long-standing lead times of four to six weeks are no longer acceptable.

Shops are now often expected to fulfill orders in a few days. This article offers a few suggestions on how to do exactly that, addressing the latter part of the "quality, cost, delivery" triangle that all shops must master.

Job Shop Workflow Hack: Use 5S Methodology to Get Organized

Who's going to complete an auto repair faster: a garage with all its tools neatly organized or one with wrenches and ratchets scattered around the shop? Lean manufacturing aficionados will tell you this is the essence of 5S, short for sort, straighten (also referred to as "set"), shine, standardize and sustain. In simplest terms, **5S** is the modern-day equivalent of Benjamin Franklin's wise saying, "a place for everything and everything in its place."

Don't have a tool crib? Better bust out the tape measure and get building. Are you always misplacing the chuck wrench? Hang it on a pegboard and outline it with a marker. Does your toolbox look like the junk drawer at home? Get to cleaning.

Embracing this mindset makes shops more efficient. Efficient shops have shorter setup times, fewer mistakes and no surprises—all of which lead to faster turnaround of manufactured parts.

Job Shop Workflow Hack: Zero-Point Clamping Systems

Going lean doesn't mean hiring a consultant or memorizing acronyms like *TIMWOOD and WORMPIT*.

It does require that you adopt sound business practices including 5S and SMED, short for *single-minute exchange of die* (or vise, fixture, chuck, etc.). As the name implies, it cuts the workholding aspect of machine setup to a minute or less.

There's no shortage of quick-change workholding technologies out there, but for machining applications, the most common is a *zero-point clamping system*. These use a retention knob similar to that of a CAT or BT tool holder.

In a typical application, two or more of these knobs are attached to the bottom of a vise or pallet, which then drops onto a pair or more of mating, spring-loaded, disc-shaped or rectangular chucks. Most come with a wrench to open and close the chuck, although air or hydraulic activation is also possible and recommended. Accuracy is usually 'within tenths,' and changeover time is best measured in seconds.

Similar technologies exist for practically all machine tools, including press brakes, *EDM equipment*, stamping presses, lathes and mills. For any shop looking to increase flexibility, dramatically reduce downtime and speed up turnaround times, this is clearly the place to start.

Job Shop Workflow Hack: Tool Holders, Offline Tool Presetters and TMS

Along the same lines, quick-change tool holders are another great way to slash setup times. This is particularly true on a CNC lathe, where swapping out a turret's worth of tools can easily burn up half an hour or more. Here again, a variety of systems are available, including *Sandvik Coromant's Capto system* and *Kennametal's KM*. Most use a tapered cone or polygonal interface for extreme accuracy and rigidity.

Perhaps the biggest benefit comes when such systems are used in conjunction with an *offline tool presetter*. Here, the tool length and diameter offsets can be measured outside the machine and sent automatically to the control, eliminating the need for manual, time-consuming touch-offs. And many presetters come with TMS, or tool management software, that can be integrated with CAD software, further increasing shop floor efficiency.

Speaking of software, imagine setting up a job on a CNC machine tool and pushing cycle start. No more riding the feed rate and rapid traverse knobs. No more hovering over the E-stop button.

Just load the program, load the tools, load the material and go. Now imagine doing that on a first-time job. This is the power of toolpath simulation software. Not only does it significantly reduce the chance of costly crashes, it also creates the opportunity for setup times of minutes rather than hours when used with the offline tool presetting and quick-change tooling.



Want to better manage the cost of your tooling inventory? Vending solutions may be for you.

Job Shop Workflow Hack: Tool Maintenance and Tool Testing Standards

Let's go back to the 5S discussion for a moment. After sort and straighten, there is shine and sustain that affirm how routine machine tool maintenance is another crucial best practice.

But what does standardize mean? One example is the use of common *turret* and carousel layouts across all the machines in the shop. The 1/2-inch four-flute end mill in pocket No. 5 on mill No. 14, for

example, will also reside in pocket No. 5 on mills No. 1 through 13. The same goes for the 4-inch face mill, the ¼-20 tap and so on.

If one size does not fit all, that's fine, but the basic premise remains: Standardize wherever possible. This is also true for hydraulic chucks, turning tools, carbide grades, drill brands, etc.

It's essential to try out new tooling as technologies advance and new efficiencies can be gained. But well-documented testing procedures need to be in place. The last thing a shop needs to do is allow unnecessary complexity in an already complex environment. The goal is always to improve efficiency, increase margins and shorten lead times.

How does your shop move parts out the door quickly? Speak your mind and ask questions in the metalworking forum.

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