

Lean Manufacturing

These Small Improvements Can Give You a Big Edge

Kip Hanson | Feb 22, 2022

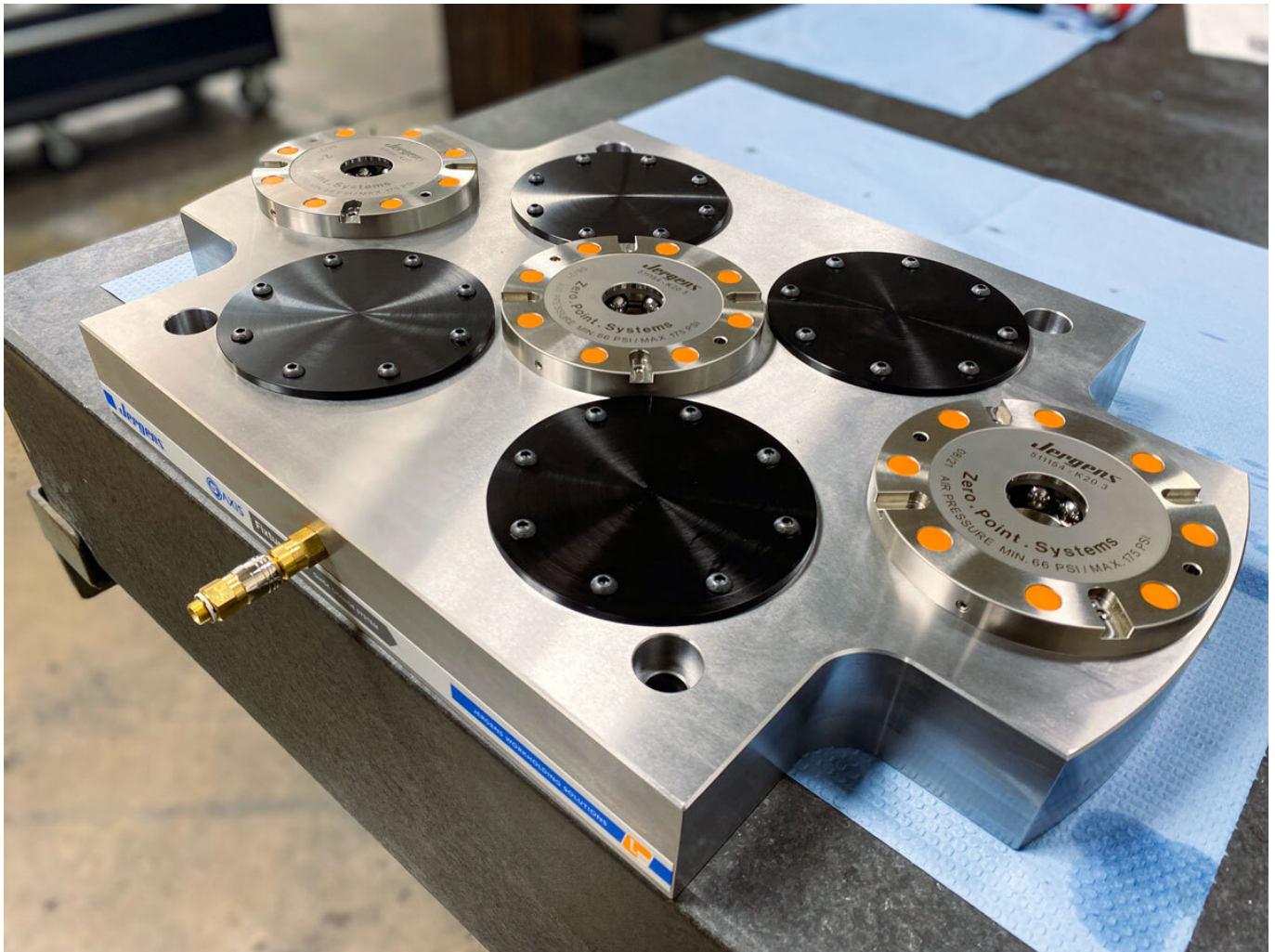
Small but regular improvements can add big gains to your facility's efficiency and profitability. Here are a few initiatives to get you headed down the right path.

Contrary to what some *lean manufacturing* pundits might tell you, continuous improvement initiatives don't have to be a big deal. In fact, anyone at the company can choose to take small but decisive steps to make the operations more efficient. These might be something as simple as organizing the toolbox or working with the programmers to create standardized toolsets for all of the lathes and machining centers. Such low- to no-cost actions not only help the company's bottom line but also make the workday a bit more fun and the job that much more rewarding.

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Ted Hoyt
Jergens Inc.

The most substantial efficiency gains usually require some investment, although most companies find the return on these improvement projects to be quite fast. Here's what several tooling and equipment suppliers say are small steps that facilities can take to improve operations:



Implementing a zero-point workholding system is a first step toward a more productive facility. (Image courtesy of Jergens)

Zero-Point Workholding

Better MRO has covered the advantages of *zero-point workholding systems* many times, noting that they *reduce setup times*, improve accuracy and *simplify part handling*. Furthermore, zero-point is practically a must-have for robotic loading and unloading. Ted Hoyt, western technical sales manager for the Workholding Solutions Group USA | Canada at *Jergens Inc.*, agrees, noting that zero-point workholding is easily his fastest-growing major product right now.

"It was a difficult sell five years ago just because of the cost and, to some extent, a lack of education about its benefits," he says. "Today, however, the investment is largely a nonissue, because those shops who've begun using it are enjoying dramatic reductions in setup time. In fact, I just completed a project with a customer who was taking two days to set up a job, and they've since reduced it to one hour. It goes without saying that returns like that are pretty impressive."

Hoyt points to several new zero-point products, among them a clamping system for small fixtures and vises: the K2. Pneumatic and hydraulic-actuated units with sensing capabilities are also quite popular, he adds, in large part due to the rise in facilities looking to automate their machining processes. "Robotic machine tending is still in its infancy, but we expect that to change over the coming year or so," he says. "This growth will be supported by products such as our new self-centering hydraulic vise and various pump kits, which we're able to combine with the zero-point line to create additional solutions."



Software can support in-process machine probing functions, leading to operational efficiencies. (Image courtesy of Renishaw)

Simplifying Machine Probing

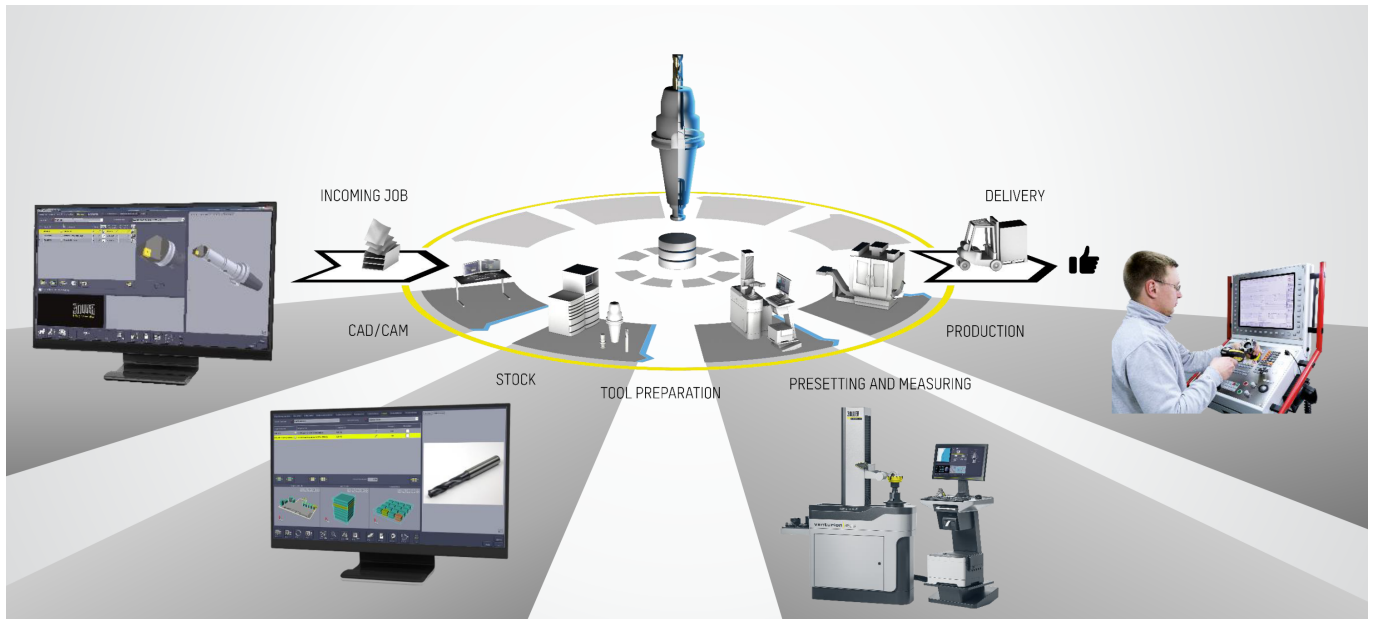
In-process machine probing is another timesaving product that's rising in popularity. Dan Skulan has some thoughts on making it easier to use. The general manager of industrial metrology at **Renishaw Inc.**, Skulan explains that the company's Set and Inspect software product has a graphical user interface that supports probing functions such as work coordinate and tool setting and basic part inspection.

This makes probing use easier for facilities that change jobs frequently or that might be unfamiliar with macro programming, he says. "We also offer a complimentary product that satisfies the needs of shops that want to see inspection data directly on the machine," he says.

Skulan suggests that a growing number of manufacturing companies inspect directly on the CNC machine tool. They're comfortable doing this because 1) coordinate measuring machines and machine tools are fundamentally the same in terms of construction and 2) provided that routine calibration is performed and the machine is traceable to a known artifact, both are equally capable of measuring most parts.

"Global aerospace manufacturers are changing their methodology to do this exact thing," Skulan says. "They're tired of losing time waiting for first-article approvals from the inspection department, never mind machining expensive workpieces only to find out later that a feature drifted out of tolerance. They've learned that, by developing capable processes, performing routine maintenance on their

machine tools, and then calibrating them in much the same manner as they would their metrology equipment, their shop floor is more efficient, and they make a lot more money.”



One of the best ways to achieve efficient machining is with a comprehensive tool management program. (Image courtesy of Zoller)

Presetting and Organizing

Dietmar Moll agrees on the need for inspection, but he’s talking about cutting tools rather than CNC machines. “In addition to offline **tool presetting**, our products allow even less skilled people to qualify and inspect tools, both for incoming inspection requirements as well as in-process checks,” he explains. “It’s quite easy to identify problems like microchipping and built-up edge, qualify corner radii and step lengths, and measure tool runout. These and other variables can have a dramatic impact on the machining process.”

As the director of business development for **Zoller Inc.**, Moll clearly is a fan of offline tool presetters. But he’s also big on shop floor and tool crib organization, and one of the best ways to achieve this is with a tool management system (TMS). The company offers several levels of TMS software that can help facilities manage tool life and inventory levels, track assets, control access to tooling, and support measuring functions. And thanks to an integrated, networkable database, it also carries businesses one step further to **Industry 4.0**.

Although Moll would love to see companies implement such a system, he also says there are many steps they can and should take before that. “It’s important that manufacturers utilize their available manpower in the most effective manner possible, and much of this comes down to their internal procedures,” he says. “They should strive to organize the production floor and tool crib. Reduce waste and lost time during their machine setups, and thoroughly document work instructions and other tooling lists. Because there’s such a shortage of skilled labor, these steps are more necessary than ever before. They’re also a prerequisite to TMS and perhaps even an offline presetter. And best of all, they’re free.”

Making Other Small Improvements

Of course, this is but a small sampling of the efficiency-boosting tooling and software systems available today. For instance, anyone using zero-point workholding on their machining centers is doing themselves a disservice by not using similar technology on their CNC lathes—the quick-change chuck or collet system. Both can easily shave off five minutes to an hour or more of ***downtime from a typical machine setup.***

So can toolpath simulation and optimization software, an often-overlooked tool that not only shortens setup times but also can eliminate a machine crash that might cost tens of thousands of dollars. There are also quick-change vises and toolholders, the latter of which are practically required for that other huge timesaver: offline tool presetting. Rotary toolholder balancing systems have proved to extend cutting tool life and improve part surface finishes when spindle speeds exceed 8,000 rpm. Shrink-fit, hydraulic and mechanical milling chucks are a huge improvement over sidelock, Weldon flat toolholders.

Just like investing in the latest CNC machine tool or enterprise resource planning system, these smaller investments are equally necessary for companies that wish to stay current and competitive. Without them, the big-ticket items will never reach their full potential.

What small improvements have you made at your facility to save time and money? Share them in the comments below.

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