



Technology

Ask an Expert: How Do You Measure the Value of Tooling?

Don Sears | Dec 15, 2017

How do you identify and measure the true value of a tool? We talk to metalworking expert Gary Plante about what's involved in evaluating tooling costs against outputs.

From a business perspective, metalworking tools may be only as good as their ability to help produce quality parts and end products profitably.

Understanding cost drivers is critical to the bottom line. The true cost of a tool rarely equates to what a business paid for it. Instead, the cost must be gauged against the tool's effectiveness in machining applications over its useful life. Some manufacturers gain business insight into tool cost and value through **activity-based costing** (ABC).

"Activity-based costing assists companies in more accurately costing their products," finds **joint research** from the University of Southern Indiana and Ohio University. "While traditional costing systems rely on a simple measure for the allocation of overhead, activity-based costing relies on cost pools and cost drivers to assign cost in accordance with overhead usage."

Cost drivers might include machine hours, complexity of the work, volume of the work and "any other product attribute that can determine its cost," such as tooling costs.

By combining these indirect costs together, a business can gain a deeper knowledge of **cost factors on the shop floor** and find out whether a tool costs too much to manufacture a given product. Time and time again, individual tool costs will end up being a small aspect of the total cost of the job, says Gary Plante, a metalworking specialist at MSC.

To find out the cost drivers of a machining operation, a procurement team or purchasing manager would want to determine the answer to several questions, such as:

- Are the tools we use optimized for the machines we have?
- How long do our tools last?
- How often do our tools need to be replaced?
- Are there new tooling technologies that might increase output?
- Can we increase tool life with different tooling approaches, workholding options or changes in toolpath?
- How much time do we spend in tool setup and tool changeover?
- Do we have a clear, documented process for managing tool purchasing and tool inventory?

To help answer these questions, Better MRO spoke with Plante, who has spent 43 years in the metalworking business. For nearly half of those years, he worked as a machinist on the shop floor. Plante shared how he helps organizations improve tool management and gain an understanding of tooling costs relative to productivity needs and business goals.

What are some of the most common areas in tooling where businesses seek to reduce costs?

Plante: Mostly with cutting tools—with an emphasis on speeds and feeds, and how those will impact the life of tools.

Many customers want to know how long a tool will last, which directly correlates with how often a shop needs to buy tools, so it has an impact on cost. This is especially true when comparison shopping cutting tools.

Tooling technology has advanced so that the material and geometry designed for the tool can make a huge impact on the end product. Some tools may be able to really help a machine produce parts or end products at higher rates. And, because of how that tool is made, it could even have a longer tool life than a less costly individual tool.

That's not always the case, but there are enough instances where it actually is true. It's great to be able to demonstrate and help reduce tooling costs by not having to replace machines and tools as often and to use tools that help optimize a machine's performance.

About the Expert

Name: Gary Plante

Title: Metalworking Specialist

Years in current role: 7

Background: 43 years in metalworking—21 as a machinist; 4 as manufacturing manager; 6 as a factory rep for Iscar Metals; 6 in sales and applications with American Tool Supply (since acquired by MSC).

Learn more about how MSC metalworking specialists can help your business.

What are the most overlooked ways that purchasing managers and machinists can reduce tooling costs?

Plante: Most purchasing managers look at the individual cost of a tool, while others look at the cost of the tool and quantity being used. Evaluating the cost of the tool and quantity being used is the better scenario.

The best solution is to reduce manufacturing time by making use of the latest technology and running with the correct feeds and speeds—along with the correct width and depth of cut suite—for the application. All the variables can result in less tooling being used and reduced part run times.

Tool regrinding is another option, as is special custom tooling to combine and produce a number of part features with one tool.

Can innovations in tools and machining affect tooling costs? If so, how?

Plante: Definitely—by using the correct tool for a certain application, such as a high-feed face mill, for instance.

You can utilize chip thinning technology too, which would allow you to run feeds and speeds much faster than normally because of the geometry of the insert and the tool holding the insert. The reduced radial forces on the tool increase the insert's life. It's a win-win in terms of tool life and tool cost.

More tooling life means less tooling spend over time. I've had customers improve operations, say from X to Y, over a year through such tactics and end up saving Z, as in real-world dollars. When purchasing managers see that on paper, they understand the benefit in familiar financial terms that help them meet or exceed their budgetary goals.

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Gary Plante

Metalworking Specialist, MSC

What areas of machining and cutting affect tooling the most, and what impact do these areas have on cost? What about productivity and output?

Plante: There are many factors at play, from poor tooling selection to tool overhang, which can affect output. Based on our data, we consistently find that these five factors affect tooling cost:

- Improper tool selection can reduce tool life by 50 percent to 75 percent.
- Improper speeds and feeds can reduce it by 50 percent to 75 percent.
- Long tool overhang can reduce it by 50 percent to 75 percent.
- Unstable fixturing or workholding can reduce tool life by 50 percent to 75 percent.
- Inappropriate coolant application can reduce it by 10 percent to 15 percent.

Ultimately, what this data means is that many manufacturers need better visibility into all of the aspects that can affect tooling and how those factors correlate to productivity. Without that information and visibility, many organizations are flying blind.

Everyone wants to reduce their costs. But you have to see tooling through a wider perspective than just the price of an individual insert or grip.

It's our job to help educate machinists and production managers, who can show purchasing managers and financial teams why tooling productivity numbers will matter more over the life and use of a tool (and can help reduce the total cost of ownership). A little explanation and demonstration of tooling options goes a long way.

How do MSC's Metalworking Specialists address tooling costs?

Plante: We go to great lengths to discuss and explain that tooling is not the biggest cost typically in the manufacturing process. We also explain how to extend tool life by reviewing cutting parameters and making recommendations on cutter selection, and on the feeds and speeds.

In addition, we often provide very detailed guidance and recommendations on programmed toolpaths to help companies find the most optimal routing to maximize both quality and output.

What's the best way to show that a tool is saving a company money?

Plante: The best way is by identifying all the machining parameters that are currently running versus the parameters of tools that might be used instead, along with the cost and quantity of the tools.