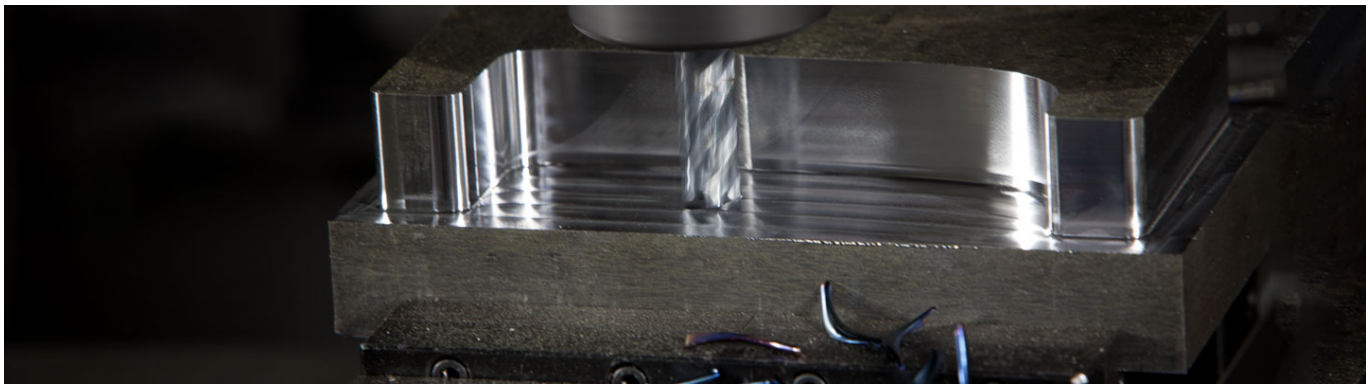

Machining

M.A. Ford's Tips for Getting the Most Out of High-Performance Cutting Tools

Matt Morgan | Nov 29, 2022

Improved cutting technologies have changed the way machinists work, giving them more confidence to approach difficult jobs and ultimately allowing manufacturers to stay competitive.

"Rather than having to purchase a high-end machine, high-performance cutting tools enable machine shops to use even entry-level CNC machines to produce much faster and more efficiently than ever before," says Anthony Reyes, a regional business manager at ***M.A. Ford***.

"No matter what material you are cutting, from plastics and aluminum to ***hard stainless steels***, titanium and Inconel, high-performance tools have allowed shops to decrease their machine cycle times to produce end products faster."

Reyes, a 30-year veteran of the trade, explains how a manufacturer can get the most out of high-performance cutting tools.

First, Be Open to It

Manufacturers have their reasons for not using high-performance cutting tools, from old equipment to old ways of thinking. Reyes has heard them all.

"A lot of shops have what they have," he says. "They're running on minimal overhead. They don't have very much money to spend. They don't want to buy an expensive cutting tool to put on an old machine. They're reluctant that it's going to be able to perform as suggested."

> **"Every shop that I have seen make the transition to high-performance tools has never looked back. They always wonder why they did not do it sooner."**
> Anthony Reyes
> M.A. Ford

Drawing on his decades of experience in manufacturing, Reyes will visit manufacturers with a sample tool from M.A. Ford and some reassurance. "I try to help them, teach them," he says. "I'll help them with how they're going to set the machine up, how to approach their workholding and ***how they're going to program it***. It's not so much they need to have the high-end machine. They can do it on a standard machine. They just have to approach it differently."

With older machines, for example, it's best not to start at the tool manufacturer's listed speeds and feeds. Instead, back off and adjust from there, Reyes says.

The limitations of the CNC machine and CAM software are also factors. "If the part requires a lot of tight moves, and the machine is not capable of reading the program far enough ahead, the machine will pause slightly to catch up to the G-code it is reading," Reyes says. "But if the part requires long, straight moves and the coding is not elaborate, the machine can read far enough ahead to keep up with the program."

On CNC machines and high-performance tools, Reyes does his best to make sure the programmers, not necessarily the business owners, are the ones who fully understand the tool's benefits and how to get the most out of it, because the ***programmers are closest to the work***.

"Using high-performance cutting tools, combined with the correct programming methods, end users can speed up their machining process to increase profitability," Reyes says. "Every shop that I have seen make the transition to high-performance tools has never looked back. They always wonder why they did not do it sooner."

Invest in Quality Tools

A high-performance tool's price tag prevents many manufacturers from committing to the technology, but that view is shortsighted, Reyes says. In fact, investing in high-performance tools and using them on existing equipment can boost production without a much larger expense for newer equipment.

"Instead of buying high-end equipment, you can buy a high-performance tool and operate an existing machine at a faster rate, but a lot of people are reluctant to do that," he says. "Some manufacturers want to keep their overhead low and will purchase their cutting tools based on cost, rather than performance. Some shops see the price of a tool and say it's way too much and resort to using a standard cutting tool. But they're going to have to buy four standard cutting tools to produce what one high-performance tool could get done if they approach and operate it the best possible way."

Read more: How M.A. Ford's TuffCut XT Line of End Mills Helps You Improve Productivity

High-performance tools are made from specific substrates to perform optimally to cut various types of materials. "How the tools perform is based on that substrate. It makes a huge difference," Reyes says. "You can buy tools at a quarter of the price, but they're not going to perform the same way. It's like you're going to buy a low-grade or a high-grade diamond. It's a diamond, but which one would you want?"

Reyes continues: "At M.A. Ford, we manufacture our tools using some of the finest premium-grade carbide material. The substrates we use combined with our different types of coatings have been proven to extend tool life. Coatings make the tools more wear resistant, reduce heat when cutting hard metal, reduce galling and make the tool more rigid."

Know the Range of Tools That Are Available

Reyes started programming CNC machines in his teens and has seen his share of cutting tools over the

years. “I was a user of M.A. Ford prior to going to work for them, so I’ve used the tools in the shop. I know their reliability, their repeatability and the quality of the tool. It’s going to last.”

He shares a sample of high-performance tools from M.A. Ford:

XV7 and XV7CB Series end mills have been designed to run at high feed rates in steel, stainless steel, titanium and high-temperature alloys. The seven-flute tools feature a thicker core and ALtima Q coating.

334 Series end mills are made for roughing aluminum at high feed rates. Gem+ coating provides excellent wear resistance and helps maintain a sharp edge.

380 Series end mills are designed for high-speed machining of titanium, Inconel and similar materials. The nine-flute tools have ALtima Xtreme coating.

2XD Series drills are available in 3X, 5X and 7X Ø and extended lengths, eliminating the need to peck and delivering great results and increased productivity. The drills have ALtima coating and come with and without coolant thru.

HPD Series drills, available in 3X and 5X Ø, are an economical choice perfect for job shop and batch production work requiring a high-performance option. These drills are ALtima coated.

CXD Series drills with ALtima coating continually outperform competitor tools side by side.

Back Off to Go Faster

“The traditional way of machining was to take a lot and move slowly. Your stepover would be a much greater percentage of the diameter of the tool, and you would really engage the tool in the metal, and you’d have very slow and lengthy run times,” Reyes says.

The traditional way also was brutal on equipment and tools. “You put a lot of load on the machine—a lot of wear and tear on the axes and servo motors—causing users to break their machines,” Reyes says.

“As CAM companies and cutting tool manufacturers evolved over the years, this thought process changed. The process of smaller stepovers and higher feed rates was introduced to the machining world,” he continues.

“You’re going to generate a faster metal removal rate than you would if you were going slow, because you’re moving quicker, and the tool is designed to do that,” he says. “It’s designed to last longer in the cut. It’ll take more abuse than it would if you were really engaging the tool.”

