

Collet chucks keep the show going

Demonstrating a machine tool's ability to cost-effectively boost productivity to a potential customer isn't effective if the cutting tool chatters at high machining parameters. Haas Factory Outlet, a division of Jeffreys Manufacturing Solutions, was experiencing such a scenario when demonstrating Haas machines tooled with conventional collet chucks, according to Ken Potts, director of training and applications for Jeffreys, Franklin, Tenn. The company is a division of Phillips Corp., which owns and operates Haas Factory Outlets in the U.S., China and India. Haas Factory Outlets provide sales and service for machines from Haas Automation, Oxnard, Calif.

He added that chattering wasn't an issue when running cutting tools with hydraulic and shrink-fit holders, but end users frequently want to avoid the extra cost associated with those toolholding techniques.

While discussing cutting tools during a meeting, Potts recalled that Michael Morgan, a regional sales representative for HORN USA Inc., Franklin, Tenn., presented a CENTRO/P precision collet chuck distributed by FAHRION and manufactured by FAHRION Vertriebs-GmbH, Kaiserbach, Germany. Potts was immediately impressed. "The holders are visibly amazing," Potts said, "and you just feel the difference in them."

However, he found the beauty of these collet chucks isn't only skin deep. According to FAHRION, the CENTRO/P collets have a maximum accuracy of 2µm and achieve a system accuracy of 3µm at 3 times diameter, 50mm maximum, when matched to its chucks. This is six times the precision of a conventional ER collet chuck, the company added.

"It's not just what that collet chuck looks like, but also how it performs," Potts said. "It doesn't vary whether you have a short collet chuck or a standard-length one; you get the same accuracy."

That minimal runout enables an end-mill, for example, to machine at a feed rate of up to 400 ipm when clamped in a CENTRO/P collet chuck, whereas the tool would chatter when held with a conventional collet chuck, according



A cutting tool clamped in a FAHRION CENTRO/P precision collet chuck machines a part during a Haas machine tool demonstration.



The FAHRION CENTRO/P precision collet chuck from HORN USA achieves a system accuracy of 3µm.

to Potts. Minimal runout also enables all cutting edges to equally engage the workpiece material and extend tool life while taking a larger DOC compared to a conventional clamping system, he added. Potts noted he didn't replace any tools held with the precision clamping system even after machining 150 parts during a 3-day demonstration at a trade show. "The main thing is my cutting tools are lasting a lot longer."

According to the manufacturer, the chuck offers maximum symmetry with

END USER: Haas Factory Outlet
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CHALLENGE: Run at high machining parameters without chatter when demonstrating machine tools.

SOLUTION: A precision collet chuck.

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minimum residual imbalance and has a ground 30° trapezoidal thread and special coating on the nut to ensure accurate centering of the nut on the chuck. In addition, the precision collet chucks provide a G2.5 balance at up to 30,000 rpm. Because the CENTRO/P collet sits completely inside the collet closing taper, it does not apply the usual bridging, thereby enabling holding forces twice as high as those of conventional collet chucks, according to the manufacturer.

Since learning about the precision collet chucks 6 months ago, Potts said he has used them in all his recent machine demonstrations. He estimates the clamping system increases productivity about 25 percent.

As a result of the higher machining parameters, longer tool life and finer surface finishes that the CENTRO/P collet chucks provide compared to conventional offerings, Potts said about half of prospective customers consider the tool clamping system after witnessing it in action, with some considering switching from hydraulic and shrink-fit holders to the collet chucks. "Whether it's a common job shop application or whether it's getting into the medical or aerospace industry where closer tolerances are needed, they're definitely looking at these collet chucks."