



Technology

How PrimeTurning™ Could Shake Up Traditional Machining

Julie Sullivan | Aug 15, 2017

What You Need to Know

The latest innovation in machining, reverse turning lets the operator cut forward, in reverse and away from the chuck for the first time.

This cutting method may help boost productivity for shops—and could be particularly helpful for automotive and aerospace applications.

Reverse turning, however, isn't ready for widespread use yet.

Dubbed an “all-directional” metal cutting approach, Sandvik Coromant’s PrimeTurning™ method seemingly upends metal removal rates and could make chip jamming obsolete.

Turning in machining is a fairly self-explanatory process—move the tool in the demo lathe in a linear path from Point A to Point B, and repeat the process over again. No gimmicks, no crazy-special techniques. That is, until recently.

Called PrimeTurning™, Sandvik Coromant’s latest innovation (a methodology for which it expects to finalize patents in mid-2018) turns traditional turning practices on their head, letting users cut not just in a forward motion, but also in reverse and away from the chuck. What’s more, the approach uses tool inserts that can cut “up from” or “down to” along the centerline of the X axis.

For manufacturers who have been turning the same way for decades, it’s a somewhat challenging concept to grasp initially. Sandvik Coromant **claims** the advantages associated with this multiangle style of cutting are fairly sizable. It suggests a company can boost productivity with PrimeTurning™ by upward of 80 percent when used for the right applications.

“These tools will change the way our customers process their parts, allowing better tool life, much higher material-removal rates and the ability to maintain tighter tolerances,” says Cory Koch, an application engineer at Hartwig in an interview with *Modern Machine Shop*. “The tools are so versatile in their design that you must think outside of the box to imagine what is possible.”

Sandvik Coromant also claims the PrimeTurning™ cutting method will extend tool life for inserts substantially and produce cleaner, smoother cuts. The expectation is that the reduced cost per component, fewer tool changes and reduced temperature at the cutting edge will help increase tool life

overall.

But the proof will be in adoption.

"This is a lot to take in," **writes** Mark Albert, editorial director of *Modern Machine Shop*. "Of course, Sandvik Coromant recognizes that the market for PrimeTurning™ will require considerable 're-education' to understand and implement the radical aspects of the process correctly."

Sandvik Coromant worked in partnership with CNC Software, makers of Mastercam, to fully develop the methodology and create the necessary algorithms. That **partnership** gives it exclusive rights to the programming software through Nov. 1, 2017.

PrimeTurning™ may prove especially useful to shops in the aerospace and automotive industries, though it is applicable, according to Sandvik Coromant, in any shop where large-batch productions require external turning operations.

"Large-batch manufacturers are most likely to see the greatest cost-per-part savings, especially if turning is a production bottleneck," notes Håkan Ericksson, product manager at Sandvik Coromant, in a *Modern Machine Shop* interview.

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Cory Koch

Application Engineer at Hartwig Inc.

Is PrimeTurning™ for Everyone?

Of course, just because an innovation exists doesn't mean the world is necessarily ready for it yet. PrimeTurning™ could transform the manufacturing industry from the inside out. But just about every aspect of the method—from its geometry to the type of computer-aided manufacturing software it requires—goes against traditional turning methods.

"The method requires stable components and a rigid setup due to the increased radial forces," Ericksson says. "This means that conventional turning may still be appropriate for vibration-prone portions of slender components."

The multiangled nose of the reverse turning insert has a dramatically different shape. Additionally, the method introduces new modified tool holders and also a new way of delivering coolant to the cutting zone. And although **CNC Software** has developed PrimeTurning™ software to sync with the new machine, that means shops must make an investment in this new software to implement the method. In reality, rollout of such software could take several years.

"Not that high-feed turning is a new thing, but these inserts seem to combine the idea with large wiper lands," **writes** commenter "gregorwarmick" on the *Practical Machinist* forum about the PrimeTurning™ announcement. "Also looks to be very much targeted at B axis machines specifically. I did watch the video when I got it this morning, but I'm not convinced there's much there that could really improve many of my processes. I can see potential for the kind of parts they show specifically in the video... I have been [working] in high-feed turning with round inserts for years. [It] [n]eeds a heavy machine with lots of torque, but it can be very effective for roughing large grooves, etc."

Sandvik Coromant advises that shops that opt to adopt the technology need to be ready to implement fully. It is early days for PrimeTurning™, but the approach certainly has caught the attention of

machinists and developers.

Will your shop adopt reverse turning technology in the coming years? If you've already adopted it, how are you using it and what lessons learned would you share? We want to know. Comment below.

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