

Milling

OSG Takes the Pain Out of Thread Milling with Innovation Trifecta

James Langford | Oct 18, 2022

For years, thread milling was the wallflower of machine shop threading techniques.

Sure, it provided consistently higher-quality results than tapping, but thread mills were more difficult to control than taps and setup took far longer as operators relied on repeated measurements with Go/No-Go gauges to ensure they were producing a good thread.

No more. **OSG**, a leading provider of thread mills, end mills and other cutting tools for industries including aerospace, automotive and heavy manufacturing, is shaking up the status quo with a trio of innovations that remove the technique's traditional pain points.

The first in what the company has dubbed a trifecta of tooling solutions is including RPRG, or the reference value for a tool radius offset, on the shank of each thread mill, explains Kyle Matsumoto, an OSG product engineer.

Buyers can plug that number into the company's ThreadPro software, the second leg of the trifecta, which generates numerical codes for CNC thread-milling jobs, he says.

Finally, there's the Diameter Correction Tool, or DCT, for thread mills that lets machinists determine how closely the threads being created conform to tolerances required for fit.

Fit is crucial in thread creation, since its purpose is enabling secure connection of two components: Think of a screw being twisted into a hole while assembling a complicated toy or piece of furniture, or a garden hose being attached to an outdoor spigot.

If the threads aren't compatible, then you can't finish the job.



OSG Diameter Correction Tool w/digital readout attached.

“Previously, a customer would buy a thread mill, then drill a hole and cut it with the thread mill and use a general Go/No-Go gauge to determine where they were,” explains Applications Engineering Manager Jeff Stephens.

Depending on the results, they would alter the CNC machine’s settings until the threads were within tolerance.

“The issue is that takes a lot of time,” he says, and machinists were never sure how close their work on a particular piece was to either end of the tolerance spectrum.

OSG’s **Diameter Correction Tool** eliminates that ambiguity. Using either an analog sleeve or a digital readout device, machinists can see “whether they’re at 30 percent of tolerance, 50 percent of tolerance or 80 percent of tolerance,” Stephens explains.

With that knowledge, users “can set their tolerance on a higher level, and if the thread-mill wear is lower than that, they don’t have to adjust the machine’s settings to compensate as often,” he adds. “There’s a huge value of setup savings and cycle-time savings with this product line.”

Minimizing cycle time is vital for machine shops trying to meet customer deadlines while grappling with a shortage of workers that may *reach 2.1 million by 2030* and simultaneously contending with surging inflation and supply-chain disruptions.

By enabling machinists to use thread milling without sacrificing valuable time or hurting productivity, OSG simplifies threading of large, expensive workpieces—especially those cast in alloys such as Inconel that are highly durable but consequently harder to cut.

Thread -milling is preferable for such products because there’s a lower risk of tool failure during the job.

That’s because thread mills are smaller than the holes being threaded and are essentially wheeled along their perimeter to create grooves, easily ejecting the small metal chips produced as a byproduct before they can clump together and impede the operation.

“There’s a huge value of setup time savings and cycle-time savings with this product line.”

Jeff Stephens
OSG

With tapping, the usual advantages of simplicity and ease that come from the tool and the hole being the same size are countered by the minimal channels for removing chips, which are forced out through grooves cut into the side of the tap.

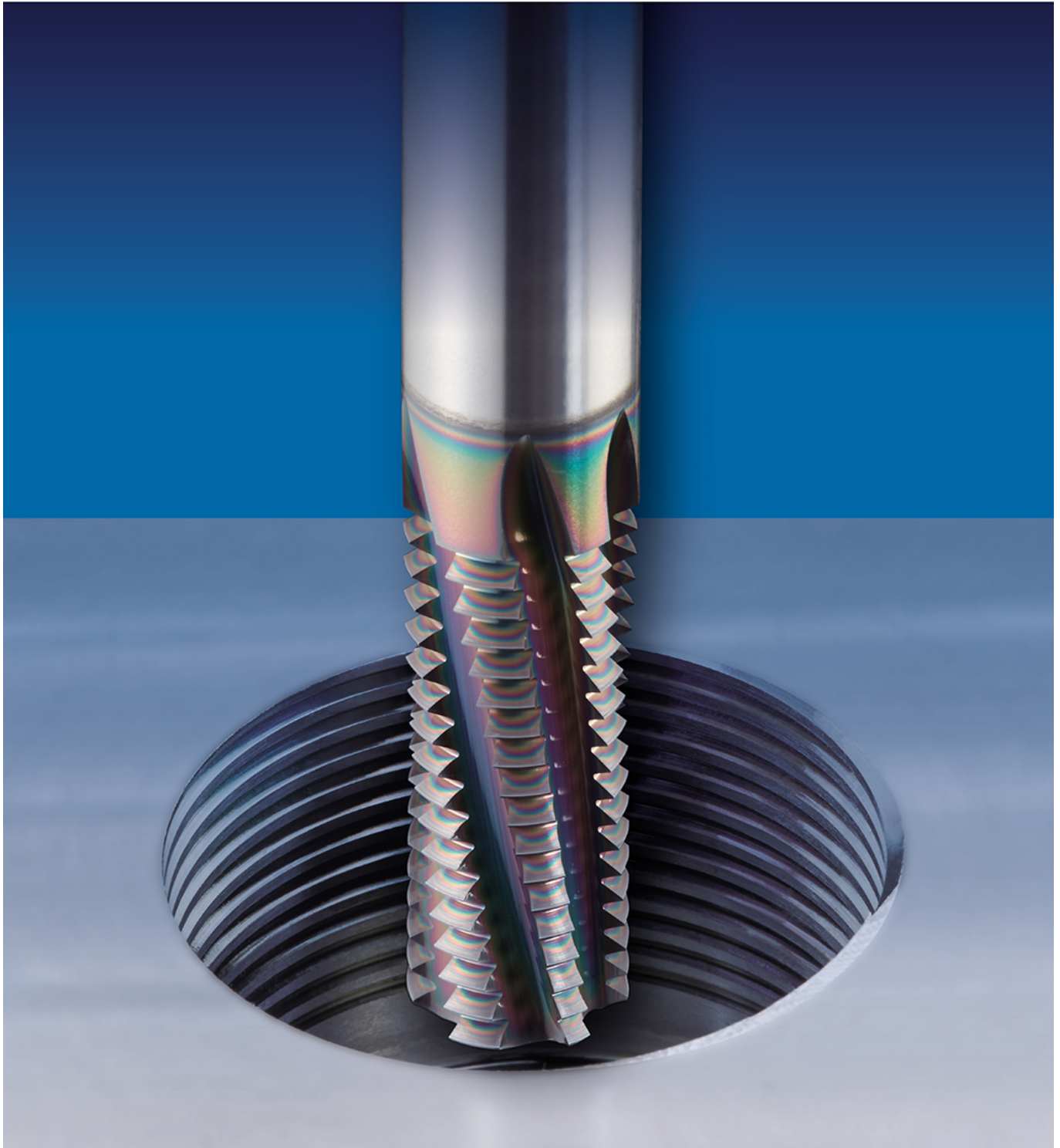
If a tap breaks, removing it is difficult and time-consuming, according to Stephens. Sometimes, costly workpieces must be discarded altogether.

In those situations, a less arduous thread-milling technique can be a game-changer. If a thread-milling tool fails during a job, removing and replacing it is far simpler.

“Customers have been very impressed,” Stephens says. “We’re saving people over half of the cycle time, just with setups.”

OSG hasn’t stopped there. The toolmaker has also introduced new thread mills under its **A Brand**:

- The **AT-1** enables threading with a single pass around a hole rather than requiring repeated turns.



The AT-1 thread mill, above, enables threading with a single pass around a hole.

- The **AT-2**, with an end-cutting edge for hard steels, eliminates the need for drilling a hole first. It shapes the hole and cuts the thread in one pass, helping to minimize the risk of tool breakage.
- The **AT-2 R-Spec ThreadRacer** adds continuous helical cutting ability to enable thread milling of nonferrous metals like aluminum at extremely high speeds.

"The tools themselves are game-changing," Stephens notes. "Being able to go from four passes to just one pass is an incredible cycle-time savings. In high-production jobs, it's a huge benefit."