Cutting downtime

Tivoly Inc. manufactures private-market HSS taps and reamers, which means it doesn't sell directly to end users.

Making taps and reamers is challenging compared to producing other cutting tools, according to Scott Gowdy, Tivoly's plant manager. "Grinding spiral flutes is especially difficult compared to straight flutes because you are dealing with complex wheel forms and multiple angles," he said. "There's a lot of different engineering that goes into the flute design and the wheel form.

"You are grinding at an odd angle," he continued. "You can get wheel deflection or washout to the back or front. Because you are grinding at an angle, you have forces directed across various angles of the wheel." Washout occurs when unintentionally grinding outside the parameters of the wheel form.

Located in Derby Line, Vt., Tivoly has 160 employees and 240 machine tools, ranging from lathes and milling machines to virtually every conceivable type of grinder. After 15 years, one of those machine tools, a flute grinding machine from International Tool Machines, succumbed to wear and tear. Tivoly contacted ITM to rebuild the machine last fall. ITM builds CNC grinding machines for the cutting tool, medical instrument, aerospace and automotive markets.

"We operate in a very oily environment, so the flute grinder's electrical system was becoming brittle," Gowdy said. "We needed to have the entire machine gutted because of the age and condition of the wires. The electrical system is so thoroughly integrated it is oftentimes not possible to simply replace single wires as they go bad."

END USER:	**Tivoly Inc.** (802) 873-6003 www.tivoly.com
CHALLENGE:	Significantly reduce downtime on a flute grinding machine.
SOLUTION:	Rebuild the flute grinder.

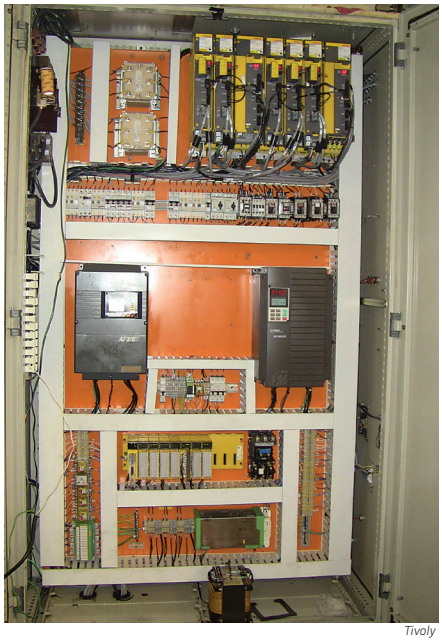
SOLUTION PROVIDER:
International Tool Machines (ITM)
(386) 446-0500
www.itmfl.com

After the rebuild, the cycle times remain about the same on the machine, but uptime is significantly greater. Gowdy noted the machine's mechanical and electrical problems caused about 400 hours of downtime a year—a $150,000 expense. "Every time it would stop working, we would have to wait on parts and the technicians to repair it," he said.

The machine had a Windows 3 computer connected to it, but the rebuilt grinder doesn't have a computer associated with it. "It is all in the new Fanuc control," Gowdy said.

That control helps reduce downtime by enabling engineers to quickly update and transfer program files. "A huge benefit is the machine is now on our computer network, so our engineers are able to drop program files into the machine for the operators," Gowdy said. "The operator can pull up a program and make whatever adjustments are needed. He doesn't have to use a data sheet like before."

The old system also used separate loader system and machine controls, but the new control combines them.



Tivoly

Tivoly's flute grinder needed to have its entire electrical system replaced.

The rebuild also addressed minor mechanical issues. However, the original machine spindle is "excellent."

ITM rebuilt the grinder at its facility in Palm Coast, Fla., in about 3 months. "They could have done the rebuild onsite, but it was a lot easier to send the machine to ITM," Gowdy said, adding that Tivoly used two similar machines to work around the rebuild schedule.

Overall, Tivoly was pleased with ITM's results. "It was quite a challenge for ITM because of the machine's age," Gowdy concluded. "They were exceptional in working with us on the new software, which they had to program from scratch. They tried to get the old programs out of the old controller, but it wouldn't give them up."

Gowdy is especially satisfied with only 2 hours of machine downtime so far this year. **CTE**

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