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The New Unison Corporation

NEWS RELEASE

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FOR IMMEDIATE RELEASE:

Ferndale, Michigan January 14, 2014 – The following article was published in the January issue of Cutting Tool Engineering Magazine:

As the market for microscale cutting tools continues to grow, Michigan Drill's Troy, Michigan facility identified a major demand for M-42 and M-2 HSS microdrills, specifically ones measuring 0.0059" to 0.020" in diameter. In addition to drills, the toolmaker, which has its primary manufacturing facility in Miami, Florida, produces reamers, endmills, taps and dies, as well as indexable, solid-carbide and carbide-tipped tools.

After approaching several companies to find a manufacturing solution, Michigan Drill partnered with Ferndale, Michigan based Unison Corporation and Norton/St-Gobain Abrasives, Worchester, Massachusetts. Unison provided the Model 2850 5-Axis CNC Tool and cutter grinder, and the toolmaker coupled the machine with Norton's T2 vitrified-bond wheel CBN and Univel-bond CBN wheels, along with a reinforced, sintered profiling diamond dress roll.

"Unison's machine was definitely the most price-competitive", said John Marion, site manager for Michigan Drill, "but, more than that, they were practically in my backyard. Their Ferndale facility is so close that some of their employees almost drive past our plant on the way to work. So, from both an economical and logistical standpoint, it was a no-brainer".

Unison has been building grinders for more than 50 years and serves numerous industries, including aerospace, medical, dental, automotive, off-highway, plastics and petrochemical. The Model 2850 has an online rotary wheel dresser and can grind reamers and drills with shank and cutting diameters from less than 0.013" to 0.375" and helical flute angles from 0° to 60°.

Norton's grinding wheels allow the company to precisely control the flute radius, according to Marion. The T2 system is a high-strength glass bond in grit size from 120 to 600, while Michigan Drill applies 1,000-grit Univel-bond CBN wheels to impart fine finishes. The T2 CBN wheels, when cooled with oil, can grind up to 5,000 drills between dressings.

"We are dressing miniscule radii, and in some cases practically no radius, on the wheel, and Unison's machine gives us the control to do that," Marion said.

He added that the toolmaker only removes a small cross-section of material when grinding microdrills, and that wear on the grinding wheel is negligible. "It's not the same as huge stock removal--- we probably damage more wheels than we use up".

"The foremost challenge when manufacturing microdrills, Marion explained, is overcoming their virtual lack of stiffness, which makes them difficult to support, as well as grip. Part of the manufacturing solution included a "pop-up" steady rest, which supports even the smallest diameter drill, according to Unison.

To decrease labor requirements, the grinder incorporates a pallet load/unload system with capacity to run up to 48 hours of unattended production, based on part volume and cycle times. The parts are loaded into and unloaded from the machine using a robotic manipulator arm, adding 6th and 7th axes of motion. The loader is able to handle workpieces as small as 0.020" in diameter. "Any smaller and it's like trying to pick up a hair," Marion said.

The machine's pallet holds 644 workpieces; while the machine finishes processing the stock, work can be briefly stopped to refill the pallet before the process continues. "As long as we have an operator to keep feeding the pallet as he's monitoring the other CNC machines we run around the clock, the machine will keep running until the job is done," Marion said.

Since its installation in late 2011, Michigan Drill has produced more than 300,000 HSS straight-diameter drills on the Unison grinder. Typical cycle time is 45 seconds, including grinding the flute point angle and, on diameters larger than 0.031", a land clearance relief. According to Michigan Drill, the Unison grinder enables the toolmaker to ship custom orders for more than 1,000 drills in less than a week.

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