Clean Spindles Increase Productivity and Reduce Breakdowns

Although CNC spindle maintenance is often overlooked due to the perception that it is a dirty and boring job, according to JM Performance Products Inc. a clean spindle is essential to avoid premature wear, repair downtime and CNC machine breakdown.

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Although CNC spindle maintenance is often overlooked due to the perception that is a dirty and boring job, a clean spindle is essential for proper taper contact between the spindle and V-flange toolholder. Buildup of chips, dust, and oil in the spindle can jeopardize taper contact and result in premature wear, repair downtime, and even CNC machine breakdown.

Ultimately, breakdowns cause production to stop; the ensuing costs are high since no parts are being produced. The most cost-effective way to increase daily CNC machine productivity is through proper maintenance—ensuring optimal toolholder to spindle contact. A breakdown's true cost can conservatively be projected between five to 15 times simple maintenance costs.

It's important to note that all V-flange tooling is designed to fit the spindle taper within tolerances of 0.0001 inch. Any debris, in the form of dust, grease, chips, or other contaminant left on the spindle, taper or flange can cause poor total indicated runout, poor tool life and poor tolerances.

Achieving a Clean, Smooth Spindle Surface

Recognizing that a clean, smooth spindle surface is essential for proper taper contact between the spindle and F-flange toolholder, JM Performance Products Inc. (Fairport Harbor, Ohio), a manufacturer of CNC mill spindle optimization products since 2009, has developed its Spindle Cleaner Kit and Spindle Restoration Kit.

The spindle cleaners and spindle restoration tapers are made from anodized aluminum that will not collapse in the spindle during use. They also come with removable handles that can be used with cleaning and resurfacing head tapers.

Designed to remove loose oil, debris, and other contaminants from CAT and BT spindles in 30, 40, 45, 50, or 60 taper sizes, the Spindle Cleaner Kit includes one or two AT3 precision tapers, removable handle(s), a 16-ounce bottle of degreaser, fabric cleaning strips, lint free towels and a carrying case.

The Spindle Restoration Kit, designed to remove high spots attributed to debris and rust that have galled to the surface of the spindle and cannot be removed through cleaning, includes two precision taper restoration heads, two spindle restoration handles, 16-ounce all-purpose cleaner, four different micron finishes of material strips and a carrying case.

Avoiding Repeat Meltdowns

S & S Tool Inc. (Conneaut, Ohio), a specialty CNC machining operation since 1985, had been experiencing ongoing crashes on its five CNC machines. President Paul Sedmak noticed high spots in the spindle that were causing the taper to sit unevenly. Seeking to avoid repeated shutdowns, which could cost approximately $6,000 per machine, Mr. Sedmak contacted JMPP President John Stoneback, who made an onsite visit and demonstrated the Spindle Cleaning Kit's simple process.

According to Mr. Stoneback, the tool ran out 0.005 inch at 5 inches from the spindle face. When he inspected it, he noticed a notch at the large end, the result of a tool that had broken loose and gouged the spindle. The spindle hadn't been cleaned in four or five years and was heavily coated with baked-on coolant, perhaps 0.005inch thick, so Mr. Stoneback began by cleaning it. He then resurfaced the spindle using the taper fitted with 40-micron aluminum oxide strips.

When he initially began the process, maintaining the pressure of the taper in the spindle was difficult because every time the tapered fin of the head hit the gouged area, the resurfacing head would jump and push out against Mr. Stoneback's hand. He had to use the all-purpose cleaner to remove debris, including metal fragments, off the strips, but after about half an hour he finally got smooth rotations. At that point, he used new strips to shine the surface, and a final cleaning with the cleaning head and towels left the spindle looking like new.

Mr. Sedmak then used a master test bar and checked the TIR, which was within 0.0001 inch out 10 inches. When taken into consideration that it would have taken a day to pull the spindle, one or two weeks to regrind it, and yet another day to reinstall the spindle, a few hours of time saved S & S Tool money in terms of downtime and lost production.

According to Mr. Sedmak, "The results were readily apparent and we implemented the kit into our maintenance schedule immediately. We've been using it for more thanthree years and won't go back. For a small investment, all of our machines run more efficiently, the tools run truer, and we're saving on cutter wear."

Providing the Optimal Maintenance Solution

JMPP's Spindle Cleaner and Spindle Restoration kits provide an optimal maintenance solution to prevent toolholder/CNC machine performance issues. According to Mr. Stoneback, "The main purpose of regular spindle maintenance is to ensure that all equipment required for production is operating at 100-percent efficiency at all times. Therefore, it's essential to implement a frequent spindle cleaning and restoration maintenance system that operators should conduct at least once per week."

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