Fixing the Hole Problem

Compensating for synchronization errors during rigid tapping can make a world of difference in feed rate, breakage and overall productivity.

Nitro Manufacturing, LLC, a CNC milling shop in Hamburg, NY, opened its doors in 2007 with just one mill and one lathe. But by setting sights on aerospace industries and needs for intricate industrial valve work and port blocks—such as the hydraulic lines to the lift bucket and rear of tractors—Bill Frascella, President and Co-founder, has been able to steadily grow the business.

Tap Troubles

Nitro Manufacturing originally produced precision industrial valves. Customers include manufacturers of servo control valves, torque motors, actuators, check valves, pressure regulators, metallic seals, pressure relief valves, pressure vessels and high vacuum equipment.

This sort of industrial valve specialty translates into a lot of work with hard, tough-to-cut materials like cast alloys and titanium. By and large, Nitro had been up to the task. But not long ago, a job fell to Nitro that quickly began giving them problems—specifically, a part that required tapping titanium (6al-4v) with a 4-40 tap, a blind hole at .350” deep.

With each job for this part consisting of 300 individual pieces, and with 11 tapped holes per part, Nitro operators were far-too-frequently snapping taps. At the height of production, they were only able to achieve a rate of roughly 15 pieces, or 165 individual holes before jamming or breaking the tap.

This meant they were burning through more than $1,000 worth of taps each time they ran the job. And that dollar figure doesn’t account for how slow they had to run in the material to minimize breakage. Nor does it account for productivity lost to stopping the operation every 15 pieces, replacing the tap, re-tapping the hole, or in the worst cases, scrapping the part. In fact, scrapped parts accounted for 15 percent of orders.

The best speeds that operators could muster were while running the Haas V-F4 at 100 RPM with a feed rate of 2.5 IPM and a cycle time of 18 minutes. Improvement on these speeds seemed impossible, but it wasn’t for lack of trying. Frascella and his team had been actively seeking solutions, but hadn’t found anything that would work.

The Mega Synchro Solution

After having seen so many taps fail at the operation, Frascella was skeptical when Mike Cohen, Sales Representative, BIG Kaiser, and Jay Janca, Distributor, Abrasive-Tool, suggested the BIG Kaiser Mega Synchro Tapping Holder, model BBT30, as a potential solution.

“I didn’t believe them, so they gave me a demonstration. Mike gave us a Mega Synchro tapping holder to try and we ran a whole order of 200 pieces with one tap,” Frascella said. **Continued on Page 2**
“More than 90 percent of our problem was taps breaking and coming out, so they stopped into the shop at just the right time. We bought every single size of each Mega Synchro tapping holder the next week.”

Nitro Manufacturing saw a return on investment within a week, “maybe within one run,” Frascella said. The company had been going through two to three boxes of 30-count taps, and now they simply run the job and not have to work on it, losing one, maybe two taps through the cycle.

Mega Synchro Tapping Holder works by compensating for synchronization errors during rigid tapping, absorbing the pitch difference between the tap and the spindle and greatly improving thread quality and tool life by easing the thrust loads caused by synchronization errors. With over 40 body varieties and almost 200 tap holders available, it’s easy to find an ideal combination of tool-and-tap holder to attain ideal projection lengths for any machine. Dual contact body models are standard, which includes BIG-PLUS CAT and BT, HSK and BIG Coromant Capto. Kaiser KAB and Weldon configurations are also available.

“Once we had the bigger Mega Synchro tool holder, we were able to do some jobs we hadn’t been able to do before. For instance, we were suddenly able to tap 0.5 inch-diameter holes 3 inches deep in stainless steel without breaking a single tap over hundreds of holes,” Frascella said. “We have to neck back the taps, turn them down so we can get that depth out. Usually, the taps would snap at that point where we weaken it, but they don’t break with the Mega Synchro.”

The new business was an unexpected perk, but in terms of problem-solving, Frascella likes to think back to the $1,000 he was spending on taps for each job run for the 11-hole titanium part. “Now that figure is more like 25 bucks,” he says. “I can think of lots of uses for 975 bucks per job run.”

Five years since opening Nitro Manufacturing, Frascella and his partners and co-founders, brother Tim Frascella and Dave Kota, employ 10 people and occupy 6,000 sq.-ft. of shop space. Nitro is now up to seven machines, including a Haas SL 20 2-axis CNC lathe, a Haas VF-2 vertical mill, a Haas VF-4 machining center, a DMG / Mori Seiki Dura Turn lathe, a Doosan Puma 2100 turning center, and a Deltronic DH216 bench-top optical comparator.

“With this range of machining centers, plus a staff of machine operators with a combined 45 years of experience in the industry, Nitro Manufacturing is large enough to take on most any job, but small enough to stay nimble and agile,” said Frascella. Frascella aims to be able to stay flexible enough to meet short deadlines.

“The staff is capable with any form of CNC machine programming, set-up and precision machining in all metals, including plastics and composites, allowing for interesting, niche side-projects. One recent job, producing wheels for harness racers, actually has turned into a thriving offshoot business—Nitro Wheel, Inc. Within three years of
its inception, Nitro Wheel became the best-selling harness racing wheels in the world, based on providing a true one-piece wheel,” said Frascella.

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