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End mill delivers high-rate metal removal for titanium roughing at low torque

5ME's Max-Flute high-performance end mills enable machining of internal structures in titanium, inconel, and stainless steel components with removal rates of up to 12 in³/min at only 45 ft lb of torque.

NOVEMBER 2013 – 5ME alters the “balance of power” in titanium cutting with the innovative design of its 20-flute CYCLO CUT[®] Max-Flute end mill, capable of removing up to 12 in³/min with only 45 ft lb of torque and 12 hp. Max-Flute tools use shallow, radial widths of cut, which transfers less heat to the cutting tool. This allows higher surface speeds for roughing titanium, inconel, and other high temperature alloys that have traditionally required high torque at low rpm to achieve desired removal rates. “These end mills enable manufacturers with lower power equipment to be competitive in the machining of titanium and other exotic materials,” said Mike Grubbs, OEM/MTB Account Manager, 5ME.

When coupled with a trochoidal machining strategy, Max-Flute end mills maintain a constant angle of engagement, making the radial cuts more consistent throughout the cutter path, increasing material removal rates and decreasing cycle times, while extending tool life. “The current approach to high-speed machining involves taking very light cuts,” added Grubbs. “The Max-Flute/Trochoidal approach allows the machine to make heavier cuts at high speeds, and by using the maximum flute density available, maximum feed rates are achievable.”

Max-Flute tools are designed with a differential pitch on the tool flutes to break up harmonics and reduce chatter. “Titanium is very prone to chatter, which affects part quality, and can cause unpredictable tool failure,” added Grubbs. “By using extremely high feed rates and light radial cuts, we can remove a lot of material with very little risk of scrapping parts.”

For more information about 5ME’s CYCLO CUT tooling, contact Mike Grubbs at 513.719.1612 or mike.grubbs@5ME.com.

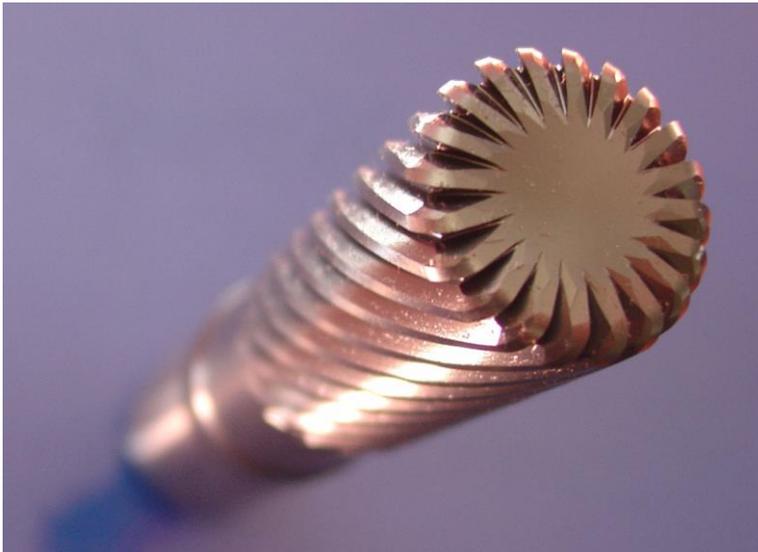
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CYCLO CUT Max-Flute high-performance end mills innovate titanium roughing with a 20-flute design capable of high removal rates at low torque. The high-density end mills run at 1498 rpm and 210 IPM to achieve removal rates of up to 12 in³/min with only 45 ft-lb of torque and 12 hp.