

HIGH METAL REMOVAL FOR TITANIUM ROUGHING AT LOW TORQUE

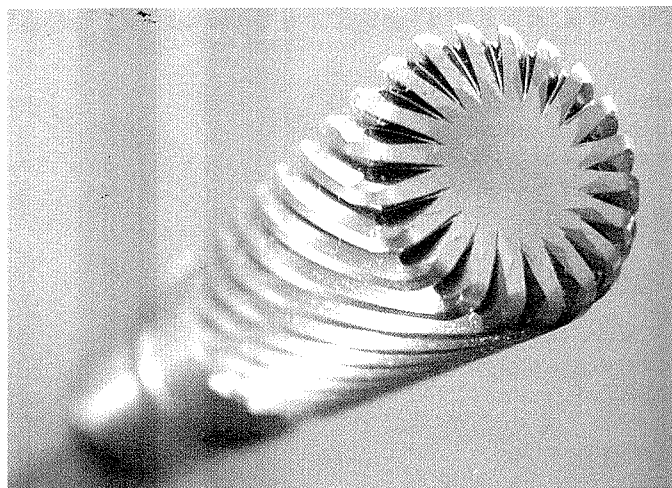
5ME's Max-Flute high-performance end mills are designed to machine internal structures in titanium, inconel, and stainless steel components with the 20-flute Cyclo Cut Max-Flute end mill, capable of removal rates up to 12in³/min at 45ftlb of torque.

Max-Flute tools use shallow, radial widths of cut, which transfer 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. Mike Grubbs, OEM/MTB account manager at 5ME said, "These end mills enable manufacturers with lower power equipment to be competitive in the machining of titanium and other exotic materials."

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," said 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," said 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."

LONG LIFE END MILL GRADES

TaeguTec has launched two new solid carbide coated end mill grades that are designed to improve a tool's life and offer overall better performance on a range of applications.

The development and implementation of the TT5515 and TT5525 grades was driven by the high demands of the mould and die, aerospace and automotive industries, which all require smaller, advanced precision components machined by solid carbide end mills that have the best wear resistance.

The TT5515 is a high-wear resistance, high performance grade recommended for medium-speed to high-speed machining, covers all ISO ranges and is ideal for the machining of parts made from alloy steel, pre-hardened steel and hardened steel.

The TT5525 is optimally balanced with wear resistance and anti-chipping properties and is perfect for general machining of carbon steel and alloy steel.

Both grades will be applied to a range of TaeguTec lines such as the ApexMill, ArtMill, RigiMill, SolidBall, StarMillPlus, SolidFeed, RibMill and RoughMill.

On two separate comparison tests against some of the leading competitors, TaeguTec's TT5515's tool life was extended by 30 minutes. One test was to machine a battery core made from alloy steel and the other was to machine a component made with carbon steel. In both cases, TaeguTec used the same cutting conditions to properly evaluate these new grades.

GRIP THE HEAVY & UNBALANCED

A new high gripping force 4-jaw chuck is available from Leader Chuck Systems it is manufactured by its Polish workholding partner, Bison-Bial. The chuck is designed for machining operations requiring high gripping forces, such as the production of large crankshafts and turbine rotors.

A clamping force of more than 20,000daN per jaw allows large cutting torques at relatively small clamping diameters to be achieved. The steel body ensures a longer lifetime, greater stiffness and resistance to wear, while the four independent jaws provide precise centring of both round and rectangular workpieces with maximum gripping forces. The T-slots machined in the chuck body permit the use of additional clamps. Installation on the machine tool spindle is direct with the use of a Type A short taper.

Mark Jones, Leader Chuck Systems' managing director, says, "The jaw guides produced in the steel body are hardened to 50HRC. The master and top jaws are made from high quality stainless steel, and are case-hardened and tempered to a hardness of 56 to 60HRC. The material and manufacturing processes selected ensure a maximum working life for the chuck."

Extremely high gripping forces are obtained by using JAKOB power screws positioned in the jaws' guideways. The chuck is designed to take full advantage of the technical features of the power screws. So, using relatively little torque on the wrench, just 110Nm, a gripping force of over 20,000daN per jaw is possible.

The precision centre, with run-out of 0.003mm, allows for exact centring of the workpiece so that high-precision operations can be carried out time-efficiently on heavy workpieces. For parts with a large unbalance, such as crank shafts, the chuck has a system of counterweights to provide additional stability and safety.