

The blue colouring reveals: An efficient tool that diverts around 80 percent of the processing heat to the chips.

Genuine Energy-Saver

by Harald Klieber

MILLING WITH 30 PERCENT LESS ENERGY CONSUMPTION – WHY, ACCORDING TO THE TOOL MANUFACTURER, THE HIGH-POSITIVE TOOL CUTTERS MADE BY AVANTEC ARE MOST SUITABLE FOR THIS WHILST THEIR ROUGHING AND FINISHING ALSO PROVIDES FOR EXCELLENT SURFACES.

Until now, machining technicians have not primarily bought Avantec's high-positive milling cutters, the best-selling product of the family business from Illingen, for their energy-saving performance. They buy them more for technical reasons, namely feed rates, says Tim Zöllner, the product manager. "With our high-positive cutting edge geometries we achieve feeds of 0.5 to 0.7 mm per tooth – at an infeed of 4.5 mm and an optimal contact width of 75 percent. According to Tim Zöllner, this is most beneficial in particular for processing steel, stainless steel, cast iron and materials difficult to machine. Therefore, up to 1,260 cm³/min. can be achieved with various types of steel and cast iron. "We can easily exceed the threshold of 10 kilos, which other manufacturers often fail." Sales manager Mathias Schneider has no doubts: whoever wants excellent surfaces at a maximum infeed of up to 4.5 mm and a feed rate of around 4 m/min. should opt for the latest milling heads or screw-on cutters made by Avantec. "The milling cutters not only provide for maximum cutting volume. They also leave surfaces with an Rz roughness value of approximately 2 µm. It is almost

Milling Tools

VIDEO:
How the OE45 face milling cutter works.





Ralf Unzeitig, Mathias Schneider and Tim Zöllner (from the left) are convinced that the new OE45 *face milling cutter's* performance is currently second to none.

irrelevant, though, whether customers are roughing with 4 m/min. or finish with 2 m/min. and a slightly smaller infeed, says Mathias Schneider, promoting the uniformly ground plates.

HIGH-STRENGTH BASIC BODIES

As the training manager Ralf Unzeitig points out, “Grinding of the plates is essential”. Without grinding the cutting edges, precision could not be achieved. Subsequently, the plates are given an additional thin PVD coating. It is crucial that the reversible-plate cutting insert geometry is best suited for the material as well as the task, and that the basic body is made from a similarly high-strength material. In Tim Zöllner’s experience only an interplay, a combination of an optimised plate ground to a tolerance of 5µm and a suitable basic body can provide the best results, i.e. “a very smooth and quiet milling process”. “There is no other way to create surfaces like that nor to achieve our long tool lives.” Another major advantage of the smooth run, according to Tim Zöllner, is the considerably improved service-life of the driving spindles, so that a twofold benefit is obtained from the high-positive cutting. As Zöllner stresses, “On the one hand, our milling cutters operate with about 30 percent less cutting force while on the other hand, along with the chips an estimated 80 percent of the heat is diverted away from the process.” This is both due to the very positive cutting wedge and to the fact that the opti-

mised chip forming element of the plates ensures low-friction removal of the chips. “Our milling cutters use around 30 percent less energy than other reversible-plate end milling cutters. The said 30 percent can also be used for an increased feed rate or infeed or even a larger face milling cutter. Our latest models are currently available with a standard diameter between 40 and 160 mm, and we offer custom-made designs with up to 315 mm in diameter.” However, Mathias Schneider explains, any machine with an engine power of up to 50 or 60 kW would reach its limits with a diameter of up to 160 mm. As a result, chips could be produced in large quantities, even with relatively low-power machines, as the plates’ cutting capacity demands only very small processing forces.

“The best thing about the new OE45 [face milling cutter](#) is that one can mill virtually everything with them. The new OE 45 models, in particular, are very universal tools.” Tim Zöllner emphasises: “They are ideally suited for manufacturers of individual parts who either prefer a classical plain cutting or want to mill a long groove, plunge mill, or else deburr or chamfer at a 45° angle.”

“The milling tools don’t just provide maximum cutting volume. They also produce excellent surfaces.”

Mathias Schneider



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