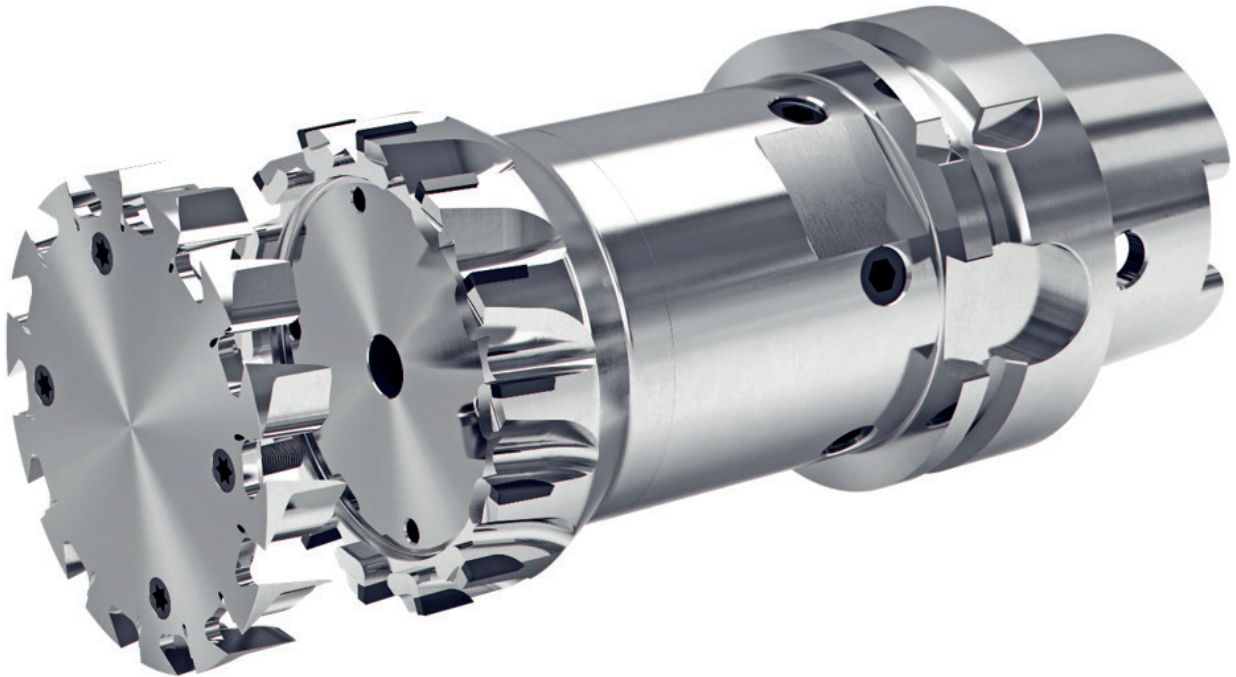


SMART CAP PCD face milling cutter

Cleanliness – process reliability – wear protection
Revolution in PCD milling technology



Thanks to its extraordinary technical details, Gühring's SMART CAP PCD face milling cutter makes it possible to achieve top productivity and energy efficiency in machining aluminium. The Smart Cap solution is produced by means of additive manufacturing and facilitates defined chip evacuation for maximum process reliability, an optimised supply of coolant and appropriate wear protection for the body.

Compared with steel, components made from aluminium with the same strength are approximately half as heavy. That is why aluminium and aluminium alloys are often used when low mass matters. This is the reason why, across the globe, this material is gaining in importance, particularly in automotive engineering, as the reduction in weight contributes to reduced fuel consumption and emissions output. The increasing complexity of the components, which is primarily caused by the growing trend for lightweight construction, requires innovative tool geometries. With this type of accessible design (which is thus independent of conventional turning and milling), it is possible to set new benchmarks in terms of tool geometry.

Gühring has been machining tool components by means of additive manufacturing since 2012. The first standard Gühring product to be made was a chamfer ring for the modular HT 800 drilling system, using laser sintering. This then paved the way for the accessible design of complex tool parts.

Defined chip removal guarantees process reliability

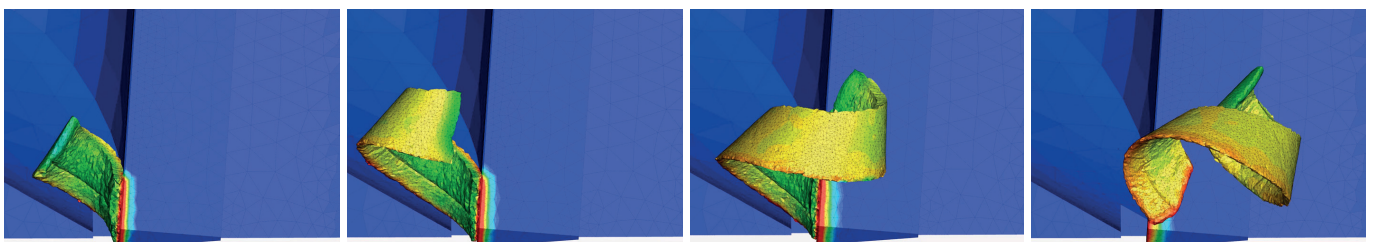
In the case of conventional PCD face milling cutters, chips can reach into the workpiece through the open chip spaces in an uncontrolled manner. The new Smart Cap PCD face milling cutter by Gühring represents a revolution in milling technology. By means of its intelligent tool geometry, it enables users to achieve defined chip evacuation for maximum process reliability. Thus, 100% of the chips can be evacuated from the component. The considerable amount of time and money previously required for cleaning the workpiece is no longer required. In this way, Gühring does not just provide resource-efficient tool solutions, but there is considerable savings potential for the user as well.

Three-dimensional cooling duct guidance

The accessible design enables three-dimensional cooling duct guidance. This guarantees optimised tempering of the PCD cutting edge, as well as reliable chip evacuation, even in MQL processing. Furthermore, the application of fixed soldered PCD cutting edges, combined with the Smart Cap solution, makes it easier for the user to handle, as the Smart Cap can simply be changed at the end of its tool life. There is no need to adjust the tool. The Smart Cap PCD face milling cutter is available in diameters from 32 mm to 125 mm, with between 8 and 22 PCD cutting edges for maximum productivity.

Application in the automotive industry: electric vehicles

PCD tools by Gühring, such as the Smart Cap face milling cutter, are chiefly used in high-tech industries, such as in state-of-the-art automotive engineering. Common workpieces, such as e-motors and cylinder heads present challenges for precision tools beyond matters of wear resistance and precision. It is also important that production remains cost efficient. The cleaner the machining process, the cheaper the manufacturing process. For example, aluminium housings for e-motors are increasingly being equipped with cooling fins. So as to prevent the chips from becoming stuck in these cooling fins during the milling process, innovative chip-guiding elements are required.



Firmly soldered chip guiding elements in combination with internal cooling ducts guide the chips 100 percent away from the workpiece.

Their three-dimensional, geometric design ensures that the chips are diverted away from the component. The geometries required for this cannot be realised using conventional methods. However, thanks to the innovative, additively manufactured Smart Cap solution, Gühring is able to meet the requirements for maximum process reliability by means of defined chip evacuation: the PCD face milling cutter with Smart Cap technology is the first fixed soldered PCD milling tool with these unique chip evacuation properties. In addition, the milling cutter impresses the user with its easy handling, as this also increases process reliability and contributes to a cost-efficient manufacturing process.