



Date: March 8th, 2021

Partner in the mining industry

Mining is as old as human history itself. Even during the Stone Age, people mined mineral resources – in the form of flints. Today, MAPAL also makes a small contribution to mining in the modern era as a partner to manufacturers of mining drilling tools.

All over the world, miners extract mineral resources, such as coal, oil, gas, metals, precious stones and salts from the earth. The construction of tunnels, pipelines or wells also falls within the scope of modern mining. So too does work carried out in quarries. Back in the early days, primitive tools were used to dig for the mineral resources, whereas today, high-tech superstructures, equipment and tools are used for mining.

Drilling tools an important part of modern mining

The drilling tools that break the rock and carry it out in chunks are an essential part of the process when blast drilling, drilling for pipelines or creating new shafts in mines, for example. Rotary bits are often used for larger diameters in a range of applications. These usually consist of three movable rollers. These rollers rotate and press against the rock. In this way, the rock particles are gradually broken off.

The use of drill bits has also already proven its worth in the field of mining, especially for smaller diameters. They work hand-in-hand with the corresponding tool holder and the machine according to the same principle as a hammer drill.

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Both types of tools (rotary bits and drill bits) have in common that their steel tool bodies (cold-work steel, alloyed tempering steel or special steel) are equipped with bit inserts made of carbide in order to break even very hard rock. After all, the bit inserts are literally at the forefront when it comes to creating the different cavities in the various types of rock and soil.

Machining the seats for the bit inserts with μm precision

To ensure process reliability in mining, a correspondingly high value is placed on the high-precision manufacturing of the tools. The drilling tool manufacturers for the mining industry therefore machine the seats for the bit inserts with μm precision. MAPAL has developed the Rockbit-Drill made of solid carbide especially for this application. Together with the MAPAL hydraulic expansion chuck, customers machine the seats for the bit inserts with high precision.

The Rockbit-Drill in detail

The Rockbit-Drill comes with an innovative coating that ensures high wear resistance, and thus a long tool life. Specially designed chip flutes ensure optimum removal of the chips. Thanks to its quadruple-bevel geometry, the tool generates an optimal bore quality in terms of alignment and position accuracy. The Rockbit-Drill is available with a tip angle of 141° for machining drill bit seats and with a tip angle of 180° for machining rotary bit seats.

Successful use in practice

One of MAPAL's customers is successfully using the new Rockbit-Drill with a diameter of 16 mm for their drill bits. The manufacturer produces the drill

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bits from low-alloy steel on a machining centre with a hollow shank taper A63 spindle. The drilling depth is 1xD-1.5xD.

Cut values:

- Cutting speed 80 m/min
- Spindle speed 1,600 rpm
- Feed 0.2 mm

The Rockbit-Drill can reliably process 1,618 bores. The customer is delighted: “We used to use a different tool from a competitor, but we could only machine 600 bores with that”. The customer was able to double the feed rate compared to what they could achieve using the previous tool. And, in this way, they could significantly increase the number of cycles. In addition, the MAPAL tools produce an optimum surface quality of R_a (average roughness value) = 0.8 μm . The Rockbit-Drill has convinced the customer in every respect – both with the accuracy of the bores and the low burr formation.

Massive savings, more process reliability and a higher degree of automation

The customer also mentions another benefit that they are able to achieve thanks to the tool from MAPAL. Depending on the bore diameter achieved, different bit inserts are pressed into the tool body. The mining tool manufacturer has various diameters of bit inserts in stock for this. The higher the variations in bore diameter, the more different inserts the manufacturer must have in stock. “Thanks to the high dimensional accuracy with the MAPAL Rockbit-Drill, we can significantly limit this variety of bit inserts, and thus save costs. The bores are within a much narrower

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tolerance range”, the customer is pleased to say. In addition, the process reliability increases. And what’s more: “We are able to achieve a higher level of automation as a result”.

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