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Rotary shaving – a heavy-duty machining process

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Rotary shaving refers to a kinematically reversed longitudinal cylindrical turning process and is one of the most sophisticated machining processes around. The workpiece is concentrically fed through a rotating shaving head and the process know-how is mostly concentrated directly at the working area. Boehlerit provides complete tooling systems for successful rotary shaving, consisting of a shaving head, holder and cartridge.

Essentially, rotary shaving constitutes a heavy-duty machining process that is usually applied to diameters ranging from 20 to 500 millimetres. With standard materials, feed rates of up to 18 millimetres per turn are achieved today, a rate that is many times higher than that achieved with general turning. Using appropriate cartridge systems, cutting depths of up to 15 millimetres are realised. Turnaround times of 600 to 800 bars with an 80-millimetre diameter made of standard materials also bear witness to the performance capacity of the used indexable inserts.

But rotary shaving is also a heavy-duty process in terms of difficulty. The processes take place using enormous amounts of cooling lubricants, which means that they are not visible to the machine operator. At the same time, tools and machines are put under an enormous amount of pressure. In the long run, this may lead to vibration or stability problems. Another aggravating factor is that cold finishing often utilises materials that are difficult to machine, such as stainless steels or nickel-base alloys, and that forged bars in particular are often quite warped and unsymmetrical.

To a large extent, process reliability is down to the experience of the machine operator and his sense of hearing. The breaking of indexable inserts in particular must be prevented, as this would cause enormous damage to the cartridges and possibly also the shaving head and the guide rollers in the insert apparatus.

Optimum processing is really only possible by assessing the process results, the dimensional accuracy and the achieved surface quality. Experienced operators will also know how to assess the chipping and the wear and tear of the indexable insert. The adaptation of process parameters and the fine-tuning of the inserts are usually performed in close cooperation with the insert manufacturer and through the composition of the cutting material and geometries, i.e. length of the cutting edge, chip-breaking geometries and design of the supporting chamfers.

Always at the top of their game

With regard to the rotary shaving of new materials, Boehlerit can always be relied on to be at the top of their game, also due to its shared history with Böhler. Böhler is one of the most important companies for the development and production of stainless steel, high-speed steel and tool steel at the highest level. In addition,

Press release

Boehlerit is in a position to offer all coating technologies in-house. Rotary shaving applicators will benefit from the comprehensive know-how resulting from a wide range of different applications and processes.

Due to the extremely high feed rates, the largest challenges in this process lie in the required coating adhesion. In addition, the application-related execution of cutting geometries is much more important than with conventional turning. In the Boehlerit portfolio, users will find the largest geometry range in standard versions, adapted to a wide range of different material categories.

Up-to-date examples for innovative solutions to machine new materials or achieve significant performance increases in rotary shaving include the development of a new insert type for machining duplex and super-duplex steel or the nano-technology for universal rotary shaving type LC228E.

Press release

The company

Boehlerit, headquartered in the Austrian town of Kapfenberg, sets global standards with carbides and tools for the processing of metal, wood, plastics and composites. With cutting materials, semi-finished products, precision tools and tool systems for milling, turning, drilling and forming, Boehlerit ensures process safety and efficiency on a global scale. The company's extensive product portfolio includes highly specialised tools for the machining of crankshafts as well as for the mining industry, for bar peeling, tube and sheet metal processing and heavy-duty machining. The Boehlerit product range also features carbides for construction components and wear protection. When it comes to coating technology, Boehlerit holds a global monopoly, ranging from the first-ever nano-CVD bonding layer to the hardest diamond layer worldwide. With its many years' experience in metallurgy, coating technology and state-of-the-art press technology, Boehlerit is a highly competent development partner for toolmakers.

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Bilder

Abb. 1: Bar peeling Image

