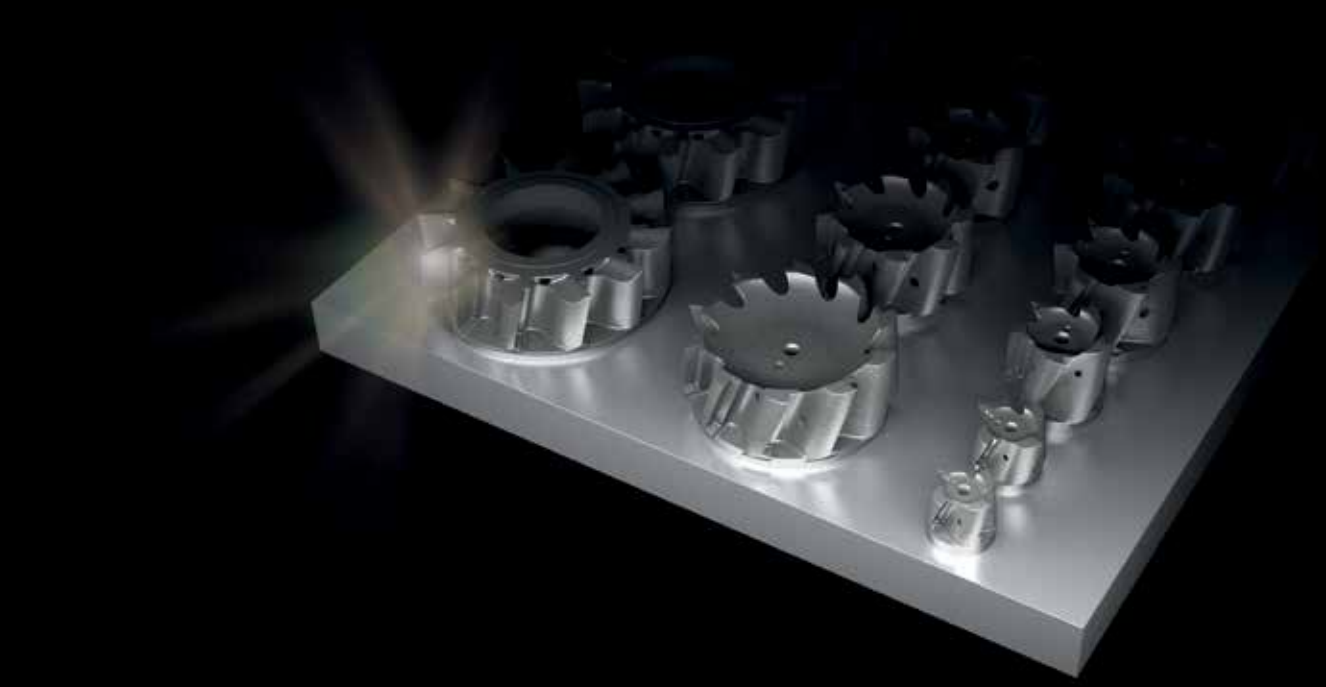
KOMET GROUP

Additive manufactured PCD-tools

(R)EVOLUTION



Laser melting as an additive manufacturing process

Drilling. Reaming. Threading. Milling.

TOOLS+IDEAS®

THE (R)EVOLUTION – LASER MELTING AS AN ADDITIVE MANUFACTURING PROCESS

Maximum number of cutting edges – approx. 50% higher feed rate

The use of 3D printing to manufacture tools produces geometries that would otherwise be impossible by conventional means. This new dimension to tool design has its unique advantages: More cutting edges and an HPC-optimised cutting edge geometry significantly increase tool productivity, achieving a feed rate that is up to 50% higher. The optimised course of the coolant channels ensures that each cutting edge is precisely supplied with coolant by a separate channel. 3D printing also outperforms conventional production methods in terms of delivery time.

When manufacturing 3D-printed tools using selective laser melting technology, the choice of laser processing strategy is crucial. The combination of technological expertise in 3D printing and decades of knowledge and experience in manufacturing high-precision tools is revolutionising the future of tool design.

Dr. Reinhard Durst, Head of research and development for solid carbide tools at KOMET GROUP , explains: „The ability to freely design the internal and external tool geometry alone means that excluding this generative process from our future plans would be inconceivable. This process increases tool performance and productivity to such a great extent that it creates considerable added value for our customers."

KOMET JEL® HPC PCD face-milling cutter

Monoblock tool with extremely short delivery times and hybrid design. 3D-printed cutting edge holder fitted with PCD cutting edges. The optimised course of the coolant channels ensures that each cutting edge is precisely supplied with coolant by a separate channel and that chips are reliably removed from the face. Patent pending.

- Useful length that can be individually determined
- Maximum number of cutting edges
- HPC-optimised cutting edge geometry
- Maximum feed rate

The key benefits of 3D printing

- Greater productivity thanks to HPC-optimised cutting edge geometry and the number of cutting edges
- Reduced component weight – material is only used where necessary for optimum component functionality
- Special tools can be delivered in a short space of time
- Cooling channels in the tool can be optimised to suit the machining process
- Greater design freedom – 3D printing is not restricted by conventional manufacturing rules. Innovative tool solutions thanks to new design freedom

KOMET JEL® HPC PCD end milling cutter
3D-printed cutting edge holder with PCD cutting edges. Despite the large L/D ratio, impressive material removal rates can be achieved thanks to the carbide shank and the HPC-optimised cutting edge geometry. Patent pending.

- Maximum stability thanks to the carbide shank
- Maximum number of cutting edges for maximum feed rate
- HPC-optimised cutting edge geometry
- 2.5×D, 4×D cutting depths
- 10/12/16/20/25/32 mm diameters
- Other diameters and lengths available on request

KOMET JEL® HPC PCD screw-in cutter
3D-printed basic body with PCD cutting edges. Maximum number of cutting edges on a single tool. For example, the number of cutting edges on a 32 mm diameter screw-in cutter has increased from six to ten. Patent pending.

- Feed rate that is up to 50% higher
- Maximum number of cutting edges
- HPC-optimised cutting edge geometry
- 10/12/16/20/25/32 mm diameters
- Other diameters available on request

PCD drilling tool

KOMET JEL® PCD drilling tool
for drilling water plugs
Brand new drilling tool with 3D-printed inserts in the chip flutes. The chips are safely transported out of the drilled hole via a curved channel route.
Significantly less cleaning is required after machining to obtain chip-free components. Patent pending.

- Optimised cooling channel routing
- No chip build-up in components
- Suitable for minimum quantity lubrication (MMS)

The process

The 3D printing process favoured by the KOMET GROUP is selective laser melting in an argon inert atmosphere.
The areas that will produce the component are precisely smelted in an extremely thin bed of metal powder using a high-performance ytterbium fibre laser and then solidified on cooling. This process is repeated with a new layer of metal powder each time until the part is finished. The layers are generally between 20 and 60 µm thick. The thinner the layer, the greater the accuracy and surface quality.

Try it now – 3D-printed tools

Our offer:
We will use your machining task to determine what added value we can offer by means of 3D tool printing.

Have we sparked your interest?
Then talk to your KOMET contact person.
Keyword: „3D printing“

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