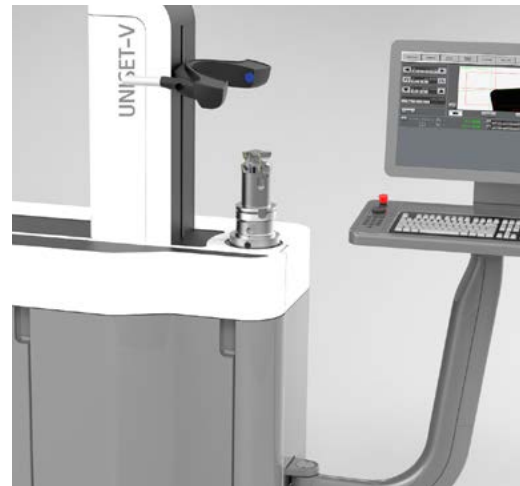
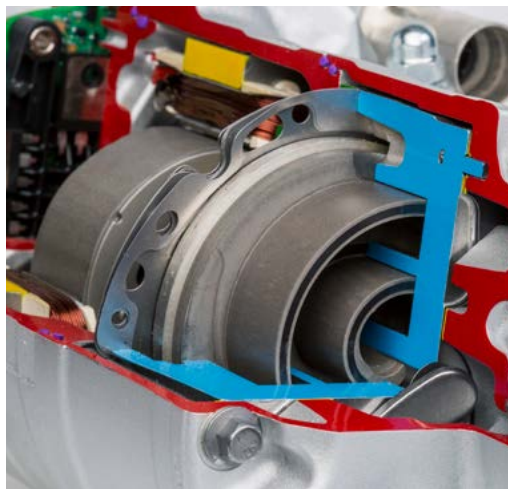
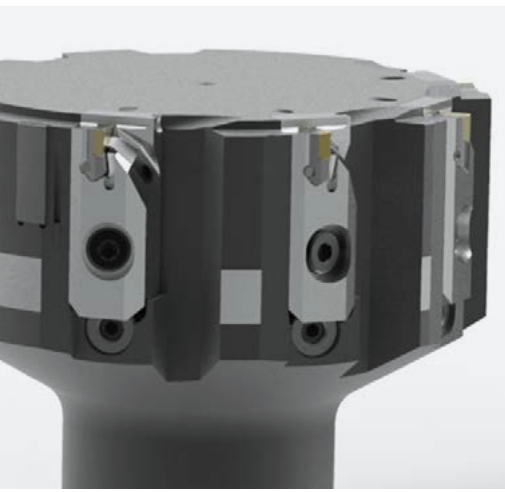




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Opening up opportunities

**We**

always find new ways to obtain more for you.

# Innovations

and product range additions 2021



## Contents

### Solutions for focus topics

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New developments for casting and steel machining _____	04
QTD STEEL-PYRAMID – New indexable insert for drilling steel _____	06
Series production of scroll compressors _____	08
E-mobility: Solutions for small motor housings _____	10
PCD for machining challenging aviation components _____	12
Rockbit-Drill improves mining tools _____	14

### Reaming and fine boring

---

PSR – Press-to-size-Reamer – Economical reaming in cast iron and steel in large quantities _____	16
FixReam range expansion – Through bore and blind bore with one tool _____	17

### Drilling

---

Tritan-Drill-Reamer – Triple-edged drilling and reaming in one machining step _____	18
MICRO-Drill-Steel – Drilling diameters from one millimetre with internal coolant _____	19

### Range expansions for solid carbide tools

---

Range expansions for solid carbide tools _____	20
--	----

### Clamping

---

New generation of clamping devices – Hydro Mill Chuck & Hydro DReaM Chuck 4.5° receive Design Award _____	22
--	----

### Setting

---

Modular optical setting fixture in the entry-level segment _____	24
--	----

### Die & Mould

---

Die & Mould: All from a single source _____	26
---	----



## New developments for cast iron and steel machining

Steel and casting materials are the most frequently used materials in machining production. Some examples are pump housings, compressors or steering systems. The developers at MAPAL always focus on the economical machining of these large groups of materials, as two successful examples show.

### New cutting material series for milling cast iron and steel components

MAPAL has developed a specially tailored CVD-coated cutting material series for milling cast iron and steel materials. The new cutting materials show their strengths especially at high cutting speeds or when dry milling takes place.

The new cutting materials HC760, HC770 and HC775 impress with their extremely heat-resistant  $\alpha$ -aluminium oxide coating with excellent layer adhesion and thus extremely long tool lives. Users can apply them at very high cutting speeds in a significantly higher range than their counterparts with a PVD coating.

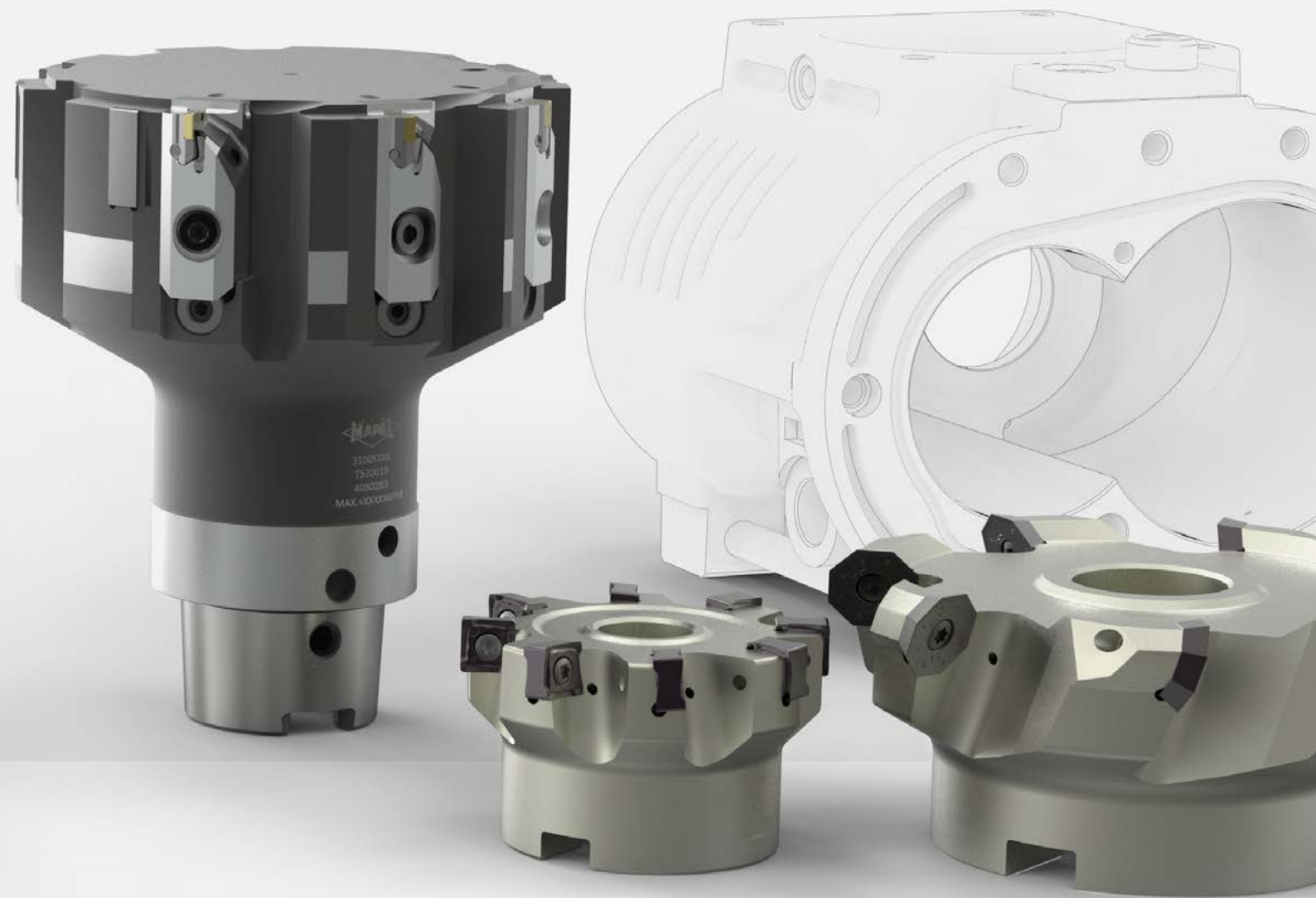
The new cutting materials are also ideally suited for dry machining. Stable machine conditions are required for their use.

#### FEATURES

- New cutting material series with CVD coating
- Suitable for high cutting speeds and for dry machining
- Stable machine conditions required

#### ADVANTAGES

- High cutting speeds
- Short machining time
- Long tool life



### Fine multiple-cutter boring of interrupted bores with EA system and CVD coating

For example machinists are faced with open or extremely interrupted bores in the case of gear pump cast housings. MAPAL has developed a multi-cutter fine boring tool with guide pads in order to machine such bores faster, reliably and more cost-effectively. MAPAL's own CVD coating, which ensures a long tool life, is used for cutters. It is ideally suited to difficult machining conditions during reaming and fine boring.

Multiple cutting edges on the tool significantly reduce the machining time compared with spindle tools or single-insert fine boring tools. At the same time, the guide pads arranged opposite the cutting edges ensure maximum accuracy. The tool can be adjusted with high precision. Appropriate distribution of material removal on the cutting edges ensures long tool lives and very good surface quality.

The EasyAdjust system (EA system) is used to clamp the indexable inserts. Its cassette holds the indexable insert stably and without any play. The back taper of the minor cutting edge is already integrated in the cassette, thus eliminating the need for back taper adjustment. Precise guiding of the cassette along a precision guide pin ensures that the back taper remains unchanged even during diameter setting.

#### FEATURES

- Fine boring with multiple cutting edges for maximum cost-effectiveness
- Also suitable for difficult machining conditions
- MAPAL's own CVD coating for reaming and fine boring
- EA system for minimal setting requirements

#### ADVANTAGES

- Long tool life
- Short machining time
- High-precision machining results
- Process reliability
- Easy to handle



## QTD STEEL-PYRAMID

### New indexable insert for drilling steel

If steel is to be machined under unstable machining conditions, for example thin walls, or large diameters are to be machined in steel, MAPAL can offer a new insert with pyramid tip for the QTD indexable insert drill. Thanks to the innovative point thinning and the geometry of the chisel edge, the tool centres itself and therefore ensures safe bore entrance even in difficult machining situations. A low burr bore exit is also ensured thanks to a flat tip angle from 160°.

The coating of the new indexable insert is specially adapted to machine steel. The tough substrate and geometry of the indexable insert also ensure long tool life and that it is highly resistant to wear. Once the indexable insert has reached the end of its tool life, users can replace it quickly, easily and with a high level of precision. Since the cost-intensive carbide is limited to the indexable insert, the use of the QTD indexable insert drill is also particularly economical.

#### FEATURES

- Use in unstable machining conditions
- Universal application (steel, cast iron)
- Innovative point thinning
- Self-centring chisel edge
- Highest performance in combination with MAPAL chucks

#### ADVANTAGES

- Improved centring properties thanks to pyramid tip
- Long tool life due to tough substrate and robust geometry
- Very good chip breaking and chip removal
- Flat tip angle (160°) for a burr-free bore exit
- Easy to handle
- Economical thanks to limitation of the cost-intensive carbide to the indexable insert



Pyramid tip  
for optimal self-centring.

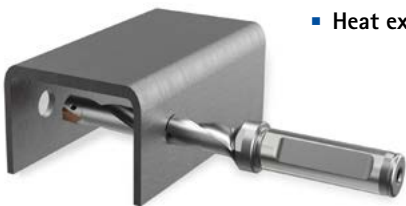


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**Applications:**

The possible applications of the QTD STEEL PYRAMID are wide-ranging. It shows its strengths wherever unstable machining conditions prevail or large diameters are machined. This includes, among other things, the machining of:

- Steel beams
- Planetary gear carriers for drive shafts
- Heat exchangers, boiler plates



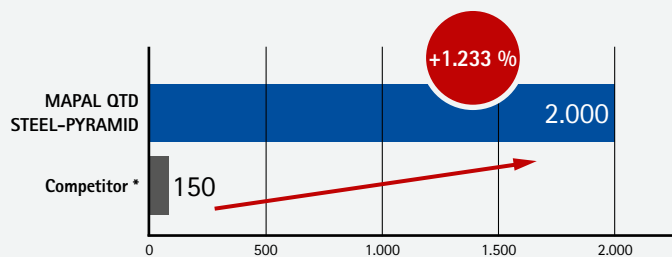
**Application example: T-beam made of S355 (St 52)**

**Machining data**

Tool: ø 18 mm | 5xD  
 Chucks: Mill chucks  
 Cooling: MQL internal cooling

$l_B$  [mm]: 90  
 $v_c$  [m/min]: 63  
 $n$  [1/min]: 1,115  
 $f_n$  [mm/U]: 0.3  
 $v_f$  [mm/min]: 334

**Number of bores**



\* Fusing of the tool holder with the part caused by jamming chips.

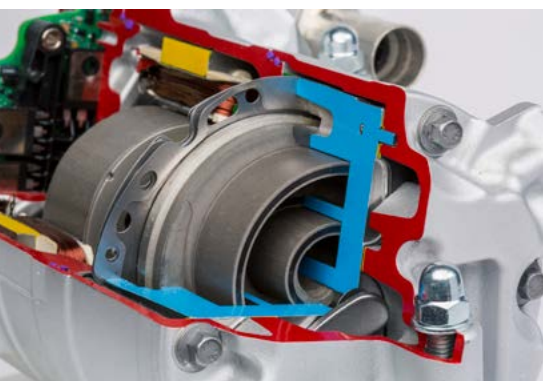


## Series production of scroll compressors

Scroll compressors have been successfully used in air-conditioning applications and heat pumps for quite some time. They stand out thanks to their high cooling capacity and reliability as well as excellent energy efficiency and low noise emission. With electrification, they are also increasingly finding their way into the automotive sector, primarily as refrigeration compressors for air conditioning systems.

At the heart of each scroll compressor are two interlocking spirals (fixed scroll and moving orbiting scroll) whose opposing movements compress the medium. The level of efficiency depends, in particular, on how precisely these parts are manufactured. In this regard, the requirements on form and position tolerances lie within the range of a few  $\mu\text{m}$ .

MAPAL offers the complete process for machining scroll compressors from a single source. Three specific machining operations on an aluminium scroll compressor for use in an electrified vehicle are presented as examples.



### FEATURES

- Process-reliable complete machining of scroll compressors made from aluminium

#### Results:

- High degree of form accuracy of the spirals ( $\leq 20 \mu\text{m}$ )
- High perpendicularity of flanks to base surface ( $\leq 20 \mu\text{m}$ )
- Parallel alignment and flatness of  $\leq 10 \mu\text{m}$
- Exact positioning of the spirals to each other

### ADVANTAGES

- Entire process design and implementation from a single source
- High-precision manufacturing for scroll compressors with high level of efficiency
- Efficient and cost-optimised tool technology
- Highest product quality, process reliability and cost-effectiveness





**1**  
High-precision spiral shapes

The machining of the spiral poses a particular challenge as it must have a defined squareness of less than 0.02 mm and an average roughness depth in the single-digit  $\mu\text{m}$  range. Despite these requirements in addition to the thin walls and the depth of the part, the finishing process should be carried out in one process.

The pre-machining and fine machining of the spirals is carried out with two three-edged milling cutters made of solid carbide. The decisive factor is the high accuracy of the tools, which ensures that the tolerances in radial and axial run-out are less than 10  $\mu\text{m}$ . The extremely sharp cutting edges ensure high dimensional accuracy. The reinforced core diameter makes them particularly stable. Finely finished chip flutes ensure safe and fast chip removal.

The finishing milling cutter is fitted with an additional chamfer on the diameter. The machining of the base, wall and the chamfer on the front face of the part can be carried out in a single step, and the tool reliably satisfies the tight tolerances with regard to perpendicularity and surface.

**2**  
Precise bearing bore

A shaft drives the moving scroll in orbit. It is supported by a roller or ball bearing, whereby the bearing bore is decisive for the positioning of the two spirals relative to each other.

Pre-machining is carried out by circular milling with a triple-fluted PCD milling cutter. The flange is then milled over. The fine machining of the bearing bore is carried out with a double-edged PCD boring tool in two steps. In the first step, the large diameter of the bearing bore is machined, the second step finishes the flange. To reduce the cutting forces, distribution of the cut takes place.

**3**  
Recesses for sealing elements

Additional sealing elements can be used to minimise the flow of refrigerant from the high to low pressure side, to seal the connection bores or to seal the entire system. Recesses are necessary for connecting these elements. The pre-machining and fine machining of the recesses is carried out with double-edged PCD boring tools. The distribution of the cut reduces the cutting force.

The fine machining tool is designed as a combination tool, and this also allows the recesses at the connection bores on the back of the fixed scroll to be machined. Chip breakers on the PCD cutting edges provide more chip control and increased process reliability.



## E-mobility: Solutions for small motor housings

Electrified mobility has long since found its way into everyday life. The general public was first introduced to electric drives on bicycles. The motor housings, among other things, pose a challenge in their production – they have to be small and light and at the same time highly accurate.

Most manufacturers of small electric motors manufacture their motor housings from die-cast aluminium – more often than diecast magnesium. The housings are very thin-walled, unstable and therefore prone to vibration. Multi-level contours within the housing provide space for the various functional motor components. The geometrical and dimensional requirements are high – tight form, running and position tolerances are specified.



Over the past decades, MAPAL has gained extensive experience in the machining of small motor housings made of both aluminium and magnesium, for example housings for chainsaws, mopeds or lawnmowers. However accuracy requirements have increased yet again with electrification.

MAPAL offers an all-round package for the machining of small housings made of aluminium or magnesium. First and foremost, PCD and solid carbide tools are ideal for machining both materials. The tool manufacturer designs the best concept including all tools and chucks depending on the requirements and complexity. Combination tools, each covering several work steps, make the process more economical.

Two tools  
are shown as examples:





**1** PCD tool machines bearing and position bores on magnesium housing

Strong vibrations in particular present a challenge when machining bearing and position bores on a specific magnesium housing because the component is extremely thin-walled in the area of the third bearing bore. The tool must remove 0.6-1 mm of material from the pre-cast bores.

**The following parameters must be observed:**

- Roundness < 0.01 mm
- Diameter tolerance IT7
- Average roughness depth  $R_z < 10 \mu\text{m}$

For this, MAPAL designed a complex, multi-step PCD combination tool which machines the three bearing bores and the bearing seat position bore in one shot - reliably and within the required tolerances.

**The tool works with the following cutting data:**

- Spindle speed 8,000 rpm
- Feed rate 3,200 - 4,800 mm/min
- Feed 0.1-0.15 mm

**2** Drilling and milling combined in a single tool

Another tool combines milling and drilling on a magnesium housing. While drilling steps machine the bearing bore and the position bore, a milling step is used to produce the sealing groove. It was also important for this tool to prevent vibration and keep the cutting pressure low. The tool experts achieved this by optimally coordinating the number of teeth and the geometry of the milling step. This also avoids chips in the groove.

**Milling step cutting data:**

- Spindle speed 8,000 rpm
- Feed rate 7,200 mm/min
- Feed 0.15 mm

**FEATURES**

- Complete package for small motor housings made of aluminium or magnesium
- Customised for the respective housing geometry

**ADVANTAGES**

- Highly cost-effective process
- Process reliability through coordinated steps
- High precision

## PCD for machining challenging aviation components

Most of the components used for modern aircraft and helicopters consist of aluminium alloys or composite materials or combinations of these materials. This has to do with the prevention of material fatigue at simultaneous low weight.

When machining aviation components, the main focus is on process reliability. PCD tools (polycrystalline diamond) from MAPAL meet this requirement to a high degree and also have impressively long tool lives and produce the best machining results.



### 60 percent longer tool life when drilling composite materials

In aircraft construction, thousands of holes have to be drilled into composite components and material assemblies for riveted connections. Solid carbide drills with a diamond coating are usually used for this. However, these are unsuitable for special applications. The limits are to be pushed back even further, especially with extremely high demands on tool life, process reliability and quality of the bore.

MAPAL has developed a new PCD drill for machining composite materials such as CFRP (carbon fibre reinforced plastic) and multilayer composites made of aluminium and CFRP in assembly. The drill distinguishes itself through its continuous PCD cutting edge. Up to now tips made of solid carbide have mostly been used in the centre, only the sides were PCD-tipped. However, the interruption of the cutting edge caused instability at the transitions and the brazed gap tended to break out. MAPAL has eliminated this instability with the new tool.

The PCD cutter, polished on both sides, is inserted into the slotted tool body made of solid carbide. This makes the whole system particularly stable. The drill centres itself very well due to the tip angle of 115°. The differential tip angle of 80° ensures a clean bore exit without delamination.

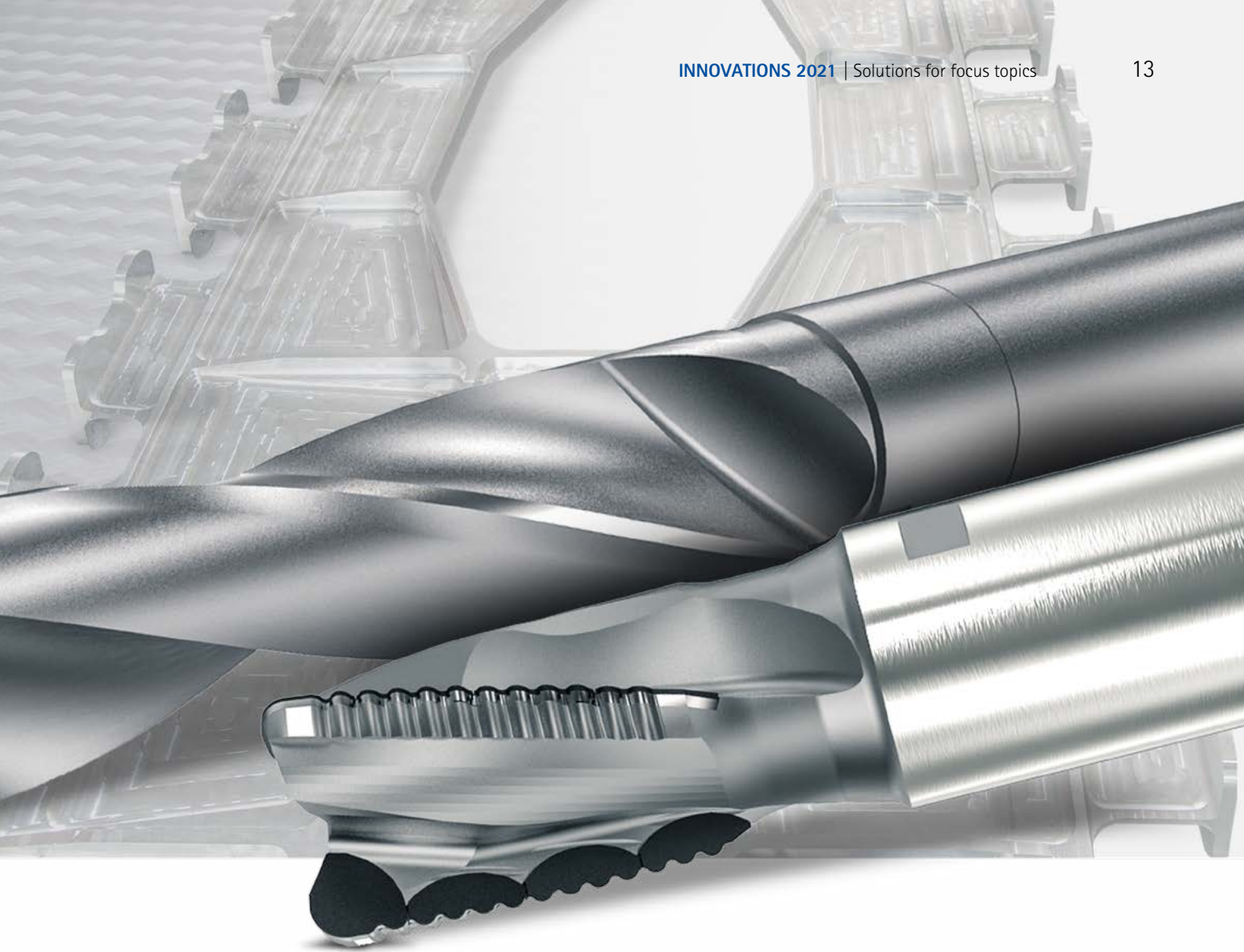
The drill is convincing during customer applications not just because of its high process reliability. A long tool life is an added bonus. In this case, holes for bolts are made in a helicopter component. The component consists of 50 mm thick CFRP. The tool used so far had reached the end of its service life after 50 bores. With higher cutting values and a significantly better quality of bore, the customer can drill over 80 bores at a diameter of 19 mm with the PCD drill from MAPAL – an increase of 60 percent compared to tools with only PCD tipped sides.

#### FEATURES

- Drill with continuous PCD cutting edge
- Polished chip flute
- Carbide guides
- Can be reground
- Can be used again by exchanging the PCD cutting edge

#### ADVANTAGES

- High process reliability
- Low cost-per-part due to long tool life
- Delamination-free bores
- Good chip or dust and thus heat dissipation



## PCD roughing cutter for dry machining

When machining the structural components of aircraft wings made of aluminium, a large portion of the existing material is removed by machining. For roughing the chambers or pockets inside the wing MAPAL has a solid carbide milling cutter, the OptiMill-SPM-Rough, in its portfolio, and this has already proven its performance many times over. However, this roughing cutter is only suitable for wet machining. Because: Solid carbide tools reach their limits when dry machining long-chipping aluminium alloys, such as those used in aircraft construction. Built-up edges quickly form, and the tools are subject to significant excessive wear.

There was an increasing demand for a tool for dry machining corresponding to the PCD-tipped milling cutter from MAPAL so that the chambers and pockets on the wing do not fill up with the cooling medium.

The geometry of the new milling cutter is in many ways identical to that of its solid carbide counterpart. The specially designed knurled roughing geometry ensures a soft cut and reduces process forces. It also gives the tool excellent plunging properties. The heat input into the component is minimal.

Due to the considerably longer tool life of the PCD tool when dry machining long-chipping aluminium alloys compared to that of its solid carbide counterpart, its use is significantly more economical. The higher tool costs are quickly amortised.

### FEATURES

- PCD roughing cutter for process-reliable dry machining of long-chipping aluminium alloys
- Knurled roughing geometry for a soft cut

### ADVANTAGES

- High material removal rate, high material removal
- Excellent quiet running
- Soft cut and reduced cutting forces
- Minimal burr formation
- Economical due to long tool life



## Rockbit-Drill improves mining tools

High-tech superstructures, devices and tools are used in mining.

Rock drilling tools are an integral part of mining processes. For example, when blast hole drilling, drilling for pipelines or creating new shafts in mines, the tools break the rock and carry it out in chunks. Rotary bits are often used for larger diameters in a range of applications. The use of drill bits has proven itself especially for smaller diameters.

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.

To ensure process reliability in mining, great importance is attached to the high-precision manufacturing of rotary bits and drill bits. The manufacturers therefore machine the seats for the bit inserts with micrometre precision.

MAPAL has developed the Rockbit-Drill made of solid carbide especially for machining bit seats. The innovative coating of the drill 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. It is available with a tip angle of 141° for machining drill bit seats and a tip angle of 180° for machining rotary bit seats.

Together with a MAPAL hydraulic clamping chuck, users machine the seats for the bit inserts with the Rockbit-Drill in a reliable process and with high precision.



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## FEATURES

- Solid carbide drill with innovative coating for machining the bit inserts of rock drilling tools
- Tip angle 141° for machining drill bit seats
- Tip angle 180° for machining rotary bit seats

## ADVANTAGES

- High wear resistance and long tool life
- Specially designed chip flutes for optimum removal of the chips
- Four-chamfer geometry for maximum bore quality in terms of alignment and positional accuracy
- Minimal burr formation
- High dimensional accuracy of bores - high degree of automation therefore is possible





## PSR - Press-to-size-Reamer – Economical reaming in cast iron and steel in large quantities

MAPAL is launching a new system of replaceable head reamers for large-scale series production. The goal of the new design was to massively reduce the costs per bore. The solid carbide replaceable heads are cost-optimized so that they are specifically adapted to individual diameters and geometries. The replaceable head system for the diameter range 12 to 25 mm consists of a robust holder, the solid carbide replaceable head and a coolant distribution element. The head can be changed by the customer's employee on site, a big plus in terms of cost-effectiveness. The replaceable head is merely exchanged and disposed of. This system does not allow the replaceable heads to be reconditioned.

By eliminating the logistics cycle, the new replaceable head system significantly improves the profitability of reaming operations in large-scale production. This effect is even rein-

forced by the fact that, in contrast to carbide-tipped reaming tools, the solid carbide replaceable heads can be designed with a CVD coating, with correspondingly positive effects on tool life.

### Application example

#### Component: Universal joint fork

Workpiece material: C18  
 Diameter [mm] : 15.025  
 Tolerance [ $\mu\text{m}$ ] : 18  
 Reaming depth [mm] : 8-16/side  
 Cutting depth  $a_p$  [mm] : 0.07  
 Roundness [ $\mu\text{m}$ ] : 9

#### Tool solution: PSR rapid set head

Number of cutting edges:  $z=6$   
 Spiral point  
 Cutting material: HP421  
 Holder for MQL  
 Tool life: 22,000 components

### FEATURES

- High-precision solid carbide replaceable head system
- Plug-and-Play
- Available in diameter range 12 to 25 mm
- Economical disposable heads
- MQL possible

### ADVANTAGES

- Easy to handle
- Highly cost-effective
- Long tool life
- Reduced logistics effort





## FixReam range expansion Through bore and blind bore with one tool

The FixReam high-performance reamer series made of solid carbide covers a wide range of applications and have already proven themselves many times in steel and cast iron machining.

MAPAL is now expanding the series to include the FixReam Short Plus with newly-developed coolant outlets. With the FixReam Short Plus users can machine both through bores and blind bores. A patented arc land chamfer ensures that the roundness and cylindrical form of the bore are improved by up to 30 percent.

The cutter layout creates a smooth run with little vibration. This leads to the best surface quality. Thanks to the tool's universal application, only one tool is needed for through and blind bores rather than two. This means a reduction in storage costs.

In addition, the short design saves carbide resources and improves the stability of the tool.

### FEATURES

- A reamer for through and blind bores
- Available in diameter range 4 to 20 mm
- Patented arc land chamfer

### ADVANTAGES

- Better quality
- Universal application
- Resource-efficient





## Tritan Drill Reamer

### Triple-edged drilling and reaming in one machining step

This is a proven way of combining several machining steps in one tool in order to manufacture as economically as possible. For example, bores can be drilled and reamed simultaneously with the Drill-Reamer from MAPAL.

MAPAL has added a further cutting edge to the Drill-Reamer in order to produce fitting bores even more accurately using just one tool.

With six guiding chamfers for excellent guiding properties, precision-ground chip flutes with matching flute shape for good chip removal and a self-centring chisel edge, the new Tritan Drill Reamer is convincing all around.

The self-centring chisel edge ensures good positioning accuracy and improved entry behaviour. Three cutting edges guarantee optimal roundness of the fit bore and highest performance. The reaming cutting edge produces best-quality surfaces.

#### FEATURES

- Combination of piloting, drilling and reaming
- Length versions 3xD and 5xD
- Three cutting edges and six guiding chamfers
- With internal cooling
- Tolerance versions  $\pm 0.003$  mm and H7

#### ADVANTAGES

- Reduced productive and non-productive times
- Best performance and highest levels of accuracy
- High degree of positional accuracy





## MICRO-Drill-Steel

### Drilling diameters from one millimetre with internal cooling

Whether in the machining of injection nozzles for vehicles or in the production of moulds for the smallest injection moulding components – machining in the micro range is used in many applications.

MAPAL has expanded its range of solid carbide drills for steel machining in order to offer the right tool for these machining operations. The new MICRO-Drill series for the diameter range from 1.0 to 2.9 mm with internal cooling allows users to drill at depths of 5xD, 8xD and 12xD. Four guiding chamfers ensure the best guiding properties. The tool experts have developed the geometry especially for the efficient and economical machining of very small bores in steel.

The flute shape with core tapering ensures ideal chip removal even with tough steel materials. Maximum performance and tool life are guaranteed thanks to a new combination of cutting materials and specially adapted micro-geometries.

FEATURES
<ul style="list-style-type: none"> <li>- Drill for machining steel in the micro range</li> <li>- Available in diameter range 1.0 to 2.9 mm with internal cooling</li> <li>- Four guiding chamfers</li> <li>- Micro-geometries matched to steel</li> </ul>

ADVANTAGES
<ul style="list-style-type: none"> <li>- Ideal chip removal</li> <li>- High level of performance</li> <li>- High level of rigidity</li> </ul>



*MEGA-Speed-Drill Steel*

## Range expansions for solid carbide tools

The existing portfolio must always be measured against the latest developments. This is how existing ranges are expanded, missing dimensions are added and existing tools are continuously improved.





OptiMill-Uni-Wave

OptiMill-Uni-HPC-Plus

1

### MEGA-Speed-Drill-Steel in 12xD

MAPAL now also offers the MEGA-Speed drill steel with a length of 12xD for high-speed machining when drilling. Three guiding chamfers ensure the best smooth running and process reliability. The friction between the chips and the tool is reduced thanks to the finely ground flute profile. Chip removal is quick and reliable. The main cutting edge is extremely robust and resilient due to its special convex form. The combination of these features ensures long tool life and maximum productivity.

#### FEATURES

- High speed drill now also available in 12xD
- Three guiding chamfers
- Finely ground flute profile
- Available in diameter range 3 to 18 mm

#### ADVANTAGES

- Best running smoothness and process reliability
- Optimum chip removal
- Robust and resilient main cutter
- Long tool life and productivity

2

### OptiMill-Uni-Wave in 4xD

MAPAL is also expanding its milling ranges. The OptiMill-Uni-Wave cord roughing cutter is now also available with a cutter length of 4xD. The solid carbide milling cutter is the ideal tool when it comes to full slot milling in different materials. Its geometry enables the highest machining rates.

#### FEATURES

- High performance roughing cutter for slot milling now also in 4xD
- Unevenly divided cutting edges
- Available in diameter range 6 to 20 mm

#### ADVANTAGES

- Universal application
- Highest machining rates
- Ideal chip formation through knorled roughing geometry
- Highly economical machining

3

### OptiMill-Uni-HPC-Plus z=2

The OptiMill-Uni-HPC-Plus with two cutting edges expands the range of the universally applicable high-performance OptiMill-Uni-HPC-Plus milling cutters. The double-edged design impresses with large chip flutes and optimised chip void geometry, thus ensuring optimum chip removal. High-performance substrate combined with a high-end coating guarantees excellent tool life.

#### FEATURES

- Large chip flutes and optimised chip flute geometry
- High-performance substrate and coating
- Dynamic spiral angles and unequal spacing
- Precise cutting edge rounding
- Available in diameter range 1 to 20 mm

#### ADVANTAGES

- Optimum chip removal
- Excellent tool life
- High surface quality
- Also suitable for ramping and grooving operations



*Hydro DReaM Chuck 4,5°*



*Hydro Mill Chuck*

## New generation of clamping devices – Hydro Mill Chuck & Hydro DReaM Chuck 4.5° receive Design Award

Both hydraulic expansion chuck series – Hydro Mill Chuck and Hydro DReaM Chuck – clearly combine the performance promise of quality and function in their new design. This is achieved through an optimal interplay of geometric and functional properties.

The newly-developed hydraulic clamping system enables high machining parameters through excellent stability and accuracy. It minimises self-excited vibration so that clamped tools are not exposed to micro-vibration. This in turn leads to a reduced spindle load of up to 15 percent, enables a significantly longer tool life and guarantees optimal surface quality.

In addition, the brilliant surface which MAPAL creates using a specially developed polishing process ensures that the chucks are more resistant to dirt and corrosion. Users can safely clamp the tool in the holder with little force requirement. This is ensured by “foolproof handling”, i.e. simple and self-explanatory handling of the chucks. This saves a considerable amount of time compared to other clamping mechanisms, especially with the Hydro DReaM Chuck 4.5°.

The new hydraulic Hydro Mill Chuck is specially designed for clamping milling tools with an HA shank. Due to the high temperature resistance of 80 °C even with very long milling cycles, it impresses with highly dynamic milling applications such as SPM (Structural Part Milling), HSC (High Speed Cutting) or HPC (High Performance Cutting) of high-quality components with excellent process reliability and a high material removal rate. Universal application for roughing, semi-finished and finishing operations.



Hydro Mill Chuck



Hydro DReaM Chuck 4,5°



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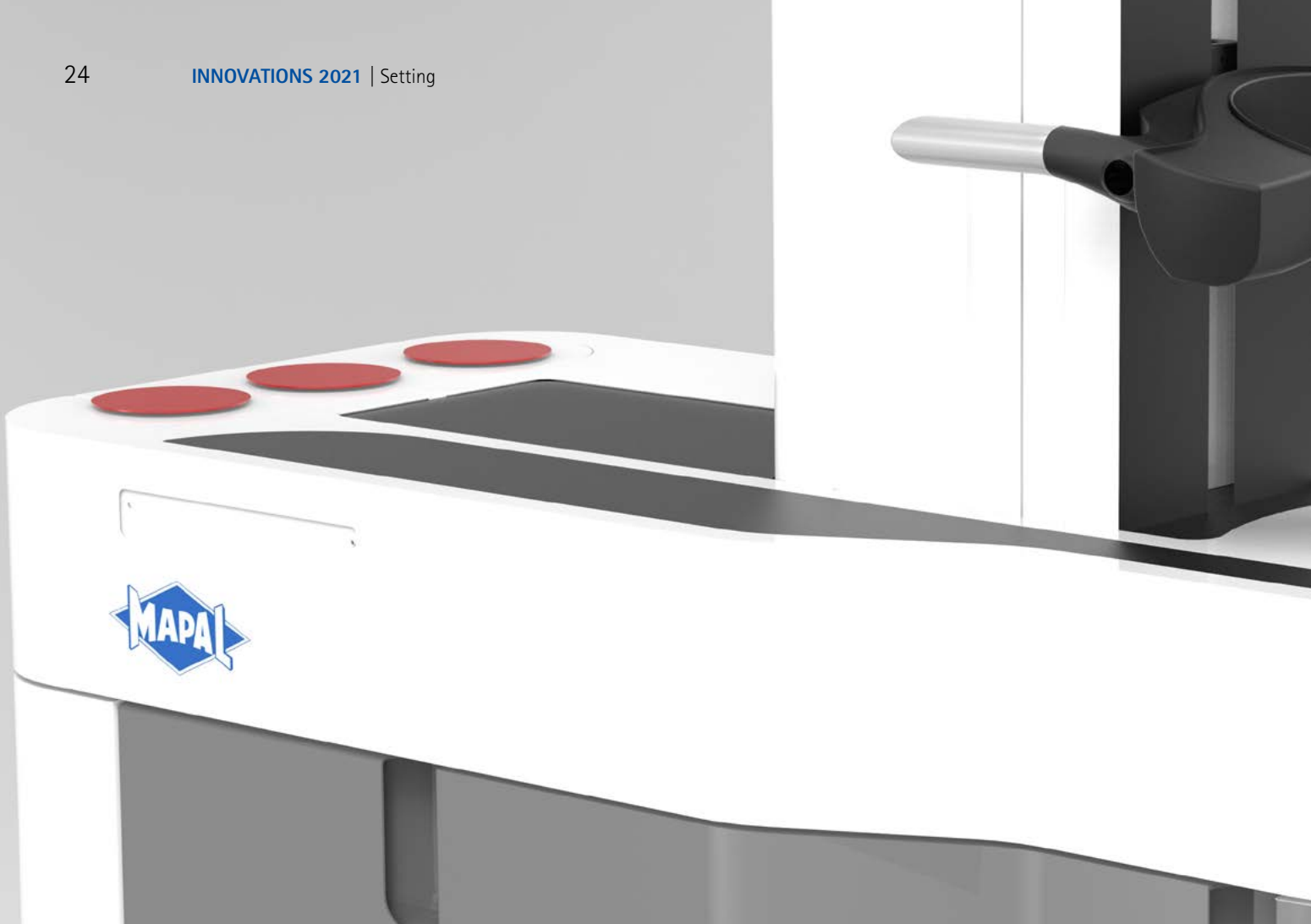
The Hydro DReaM Chuck 4.5° is ideally suited for reaming and drilling applications as well as for use with finishing milling cutters. Thanks to the clamping initiation in the hollow shank taper flange, it enables maximum rigidity with minimal use of material at minimal tool restriction. The outer contour of the Hydro DReaM Chuck is based one to one on DIN 69882-8 for heat shrink chucks. This means that the advantages of hydraulic expansion technology can be transferred to these applications.

### FEATURES

- **Hydraulic Hydro Mill Chuck** for highly dynamic milling applications
- Excellent results when using tools with HA shanks
- For high-performance milling operations up to max. 33,000 revolutions per minute
- **Hydraulic Hydro DReaM Chuck 4.5°** for reaming and drilling applications as well as for finishing during milling operations
- Slim DIN contour with 4.5°
- Maximum process reliability and tool life due to award-winning industrial design

### ADVANTAGES

- Maximum stability at optimal use of resources
- Low actuation torque
- High long-term temperature resistance
- Optimum surface quality
- Dirt and corrosion-resistant
- Self-explanatory, simple handling



## Modular optical setting fixture in the entry-level segment

The portfolio for the digital configuration area is extended by a new setting fixture in the UNISET-V series. It paves the way for fully automated measuring sequences with high-precision camera systems and therefore provides

the optimal basis for further process automation. This closes the gap between the existing products from the manual UNISET-C product line for the entry-level range and the premium models of the UNISET-V series for the fully au-

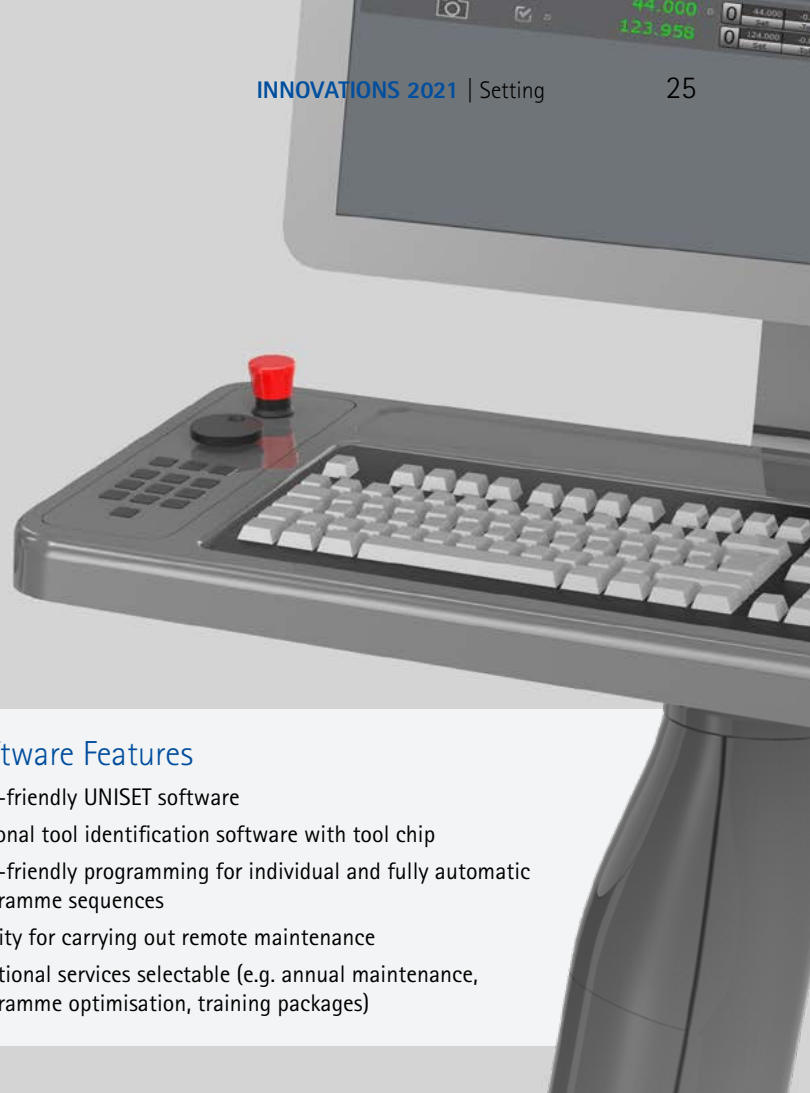
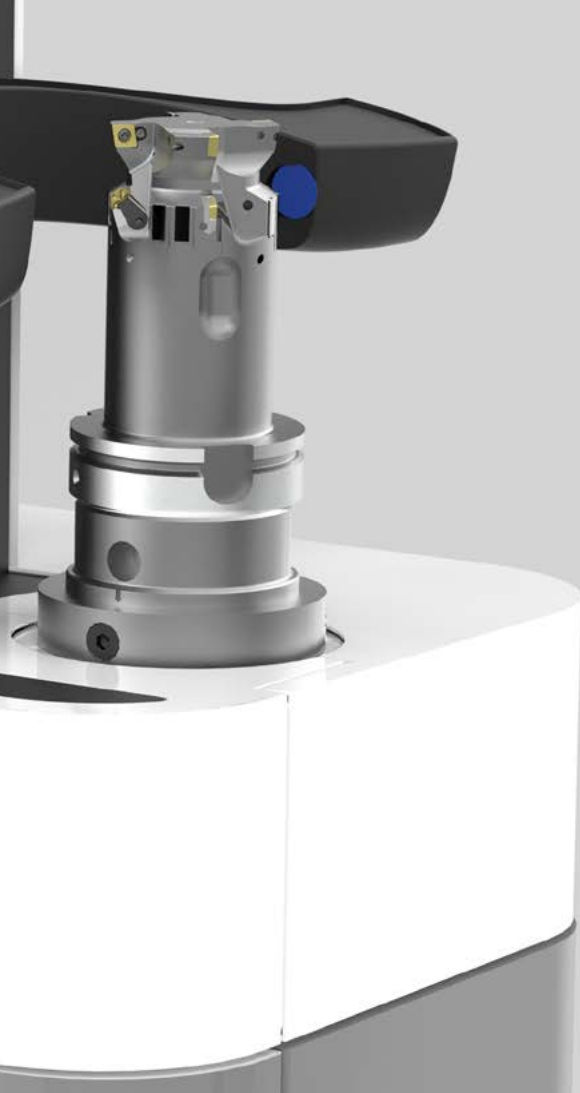
tomatic measurement of complex tools with probe and camera systems.

The setting fixture has a compact, vibration-damped design and is firmly connected to a base frame. The good accessibility and accuracy of repetition of  $\pm 2 \mu\text{m}$  allows the tools to be adjusted easily and in a way that is process-reliable. The main focus of the setting fixture is on the measuring yoke with optical measuring camera. Thanks to its linear drive, it can be automatically moved quickly, precisely and silently in horizontal and vertical directions to the desired measuring position.

Due to the modular design, the setting fixture can be configured according to individual requirements. Measuring ranges of up to 1,000 mm in terms of tool diameter and tool length can be covered, among other things. Fixed tools, in particular, such as solid carbide







### Software Features

- User-friendly UNISET software
- Optional tool identification software with tool chip
- User-friendly programming for individual and fully automatic programme sequences
- Facility for carrying out remote maintenance
- Additional services selectable (e.g. annual maintenance, programme optimisation, training packages)

or PCD tools, can be measured and adjusted fully automatically using the UNISET-V. Tool weights of up to 160 kg are no problem for the UNISET-V.

By using the UNISET software, the new setting fixture can be seamlessly integrated into existing structures. It offers all possibilities in terms of connections with CAM systems, machine tool controllers and the dispensing systems from the UNIBASE product line. Integrated control geometries enable fully automatic measurements on the 24" touch screen within a few seconds. An optional tool chip can be used to call up or log tool data more quickly. Extensions or adaptations of the UNISET software are possible at the customer's request.

### FEATURES

- Precise adjustment and measurement with high level of repetition accuracy ( $\pm 2 \mu\text{m}$ )
- Tools up to 1,000 mm in diameter and length adjustable
- Stable vibration-damped construction with integrated monitor bracket
- Optional second camera on the measuring frame to check the rotation centre height with adjustable incident light

### ADVANTAGES

- Flexibly configurable thanks to modular design
- Good accessibility on mobile base frame
- Fast and precise handling and positioning of measuring clamp by linear drive
- Intuitive and comprehensive UNISET software

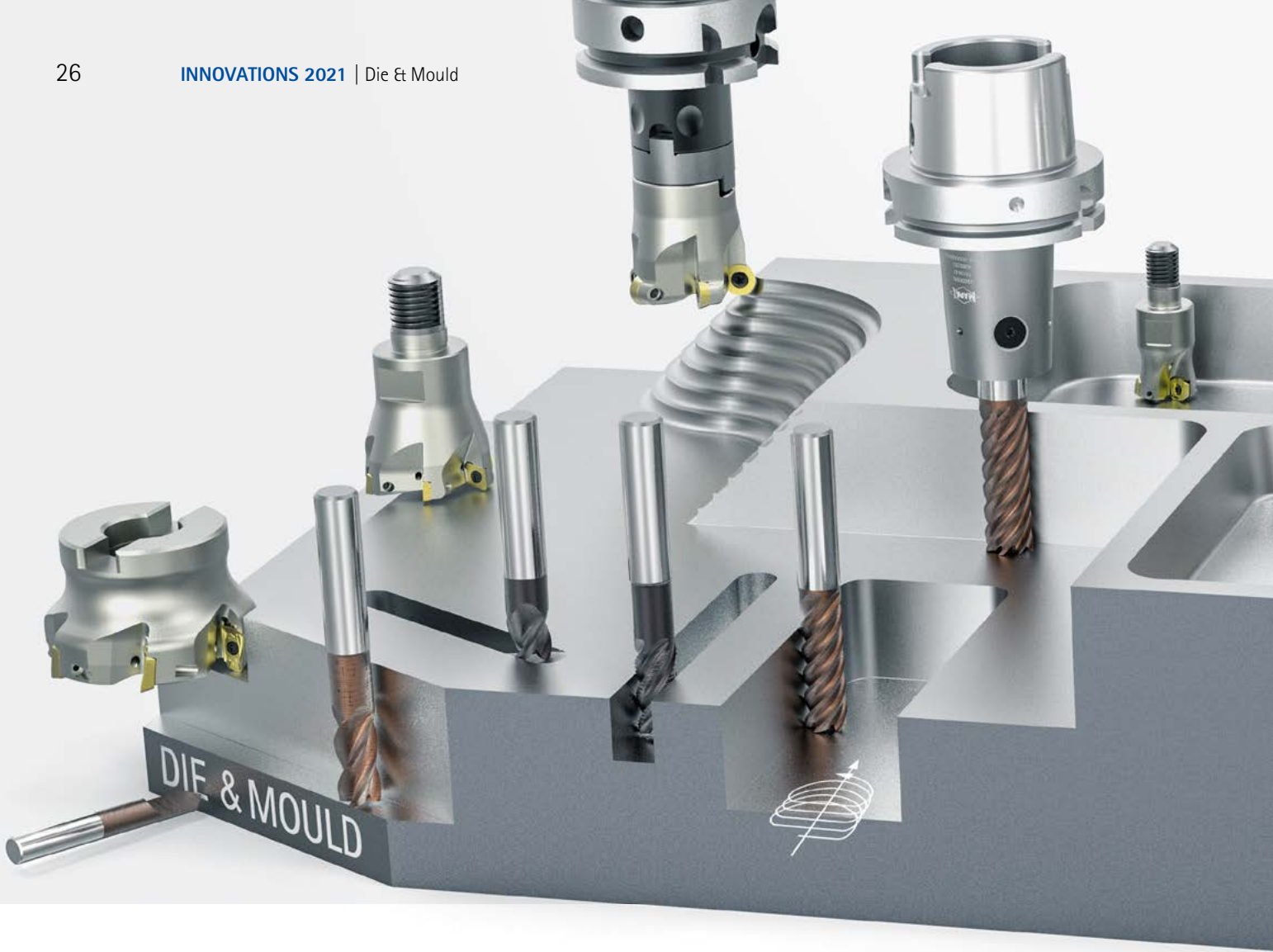


c-Connect is optionally available for the new setting fixture and enables simple and efficient digitisation of tool data.

Consisting of a box and comprehensive software, c-Connect offers an option for networking the machining machines during manufacturing easily and cost-effectively and of transferring tool data without errors.

#### Advantages of c-Connect:

- No chance of errors resulting from manual input of tool data into the machines control
- Machine downtimes are minimised – c-Connect monitors the machine indirectly via the machine traffic lights
- All data is transparent and is still available after tool removal
- Unnecessary non-productive time is saved and the machine can be set up faster
- Independence from machine control and manufacturer
- c-Connect is also available as an offline solution



## Die & Mould: All from a single source

As a technology partner, MAPAL offers tool and mould makers not only a high level of process know-how but also technologically leading tools and services which meet the needs and requirements of this market precisely. The focus is on the highest levels of precision, a long tool life, and – above all – process reliability.

The broad portfolio from MAPAL includes high-performance precision tools for all areas of application. The range is supplemented by matching clamping technology and various services relating to process optimisation and networked production – all from a single source. MAPAL can also offer customised tool solutions on request.





Discover more under:  
[die-mould.mapal.com](http://die-mould.mapal.com)

### New "Die & Mould" catalogue

MAPAL presents its range of tools in the areas of milling, drilling from solid and countersinking as well as reaming and fine boring on over 500 pages. The clamping technology range are included in addition to setting, measuring and despening devices.



The catalogue is available in German and English. Other languages are currently in preparation.

The standard tools listed in the catalogue are available from direct sales and from MAPAL's trading partners, initially in Germany. The entire range for the die and mould sector will be available internationally from 2021 onwards.

Further interesting insights into machining solutions for the die and mould sector can be found at [die-mould.mapal.com](http://die-mould.mapal.com). The electronic version of the catalogue can also be downloaded there.

### FEATURES

- Complete range of tools, clamping technology, peripherals and services
- Technology partner with extensive machining and process know-how
- Customer-specific solutions

### ADVANTAGES

- Comprehensive portfolio
- All from a single source
- Technologically leading tools
- Short delivery times



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