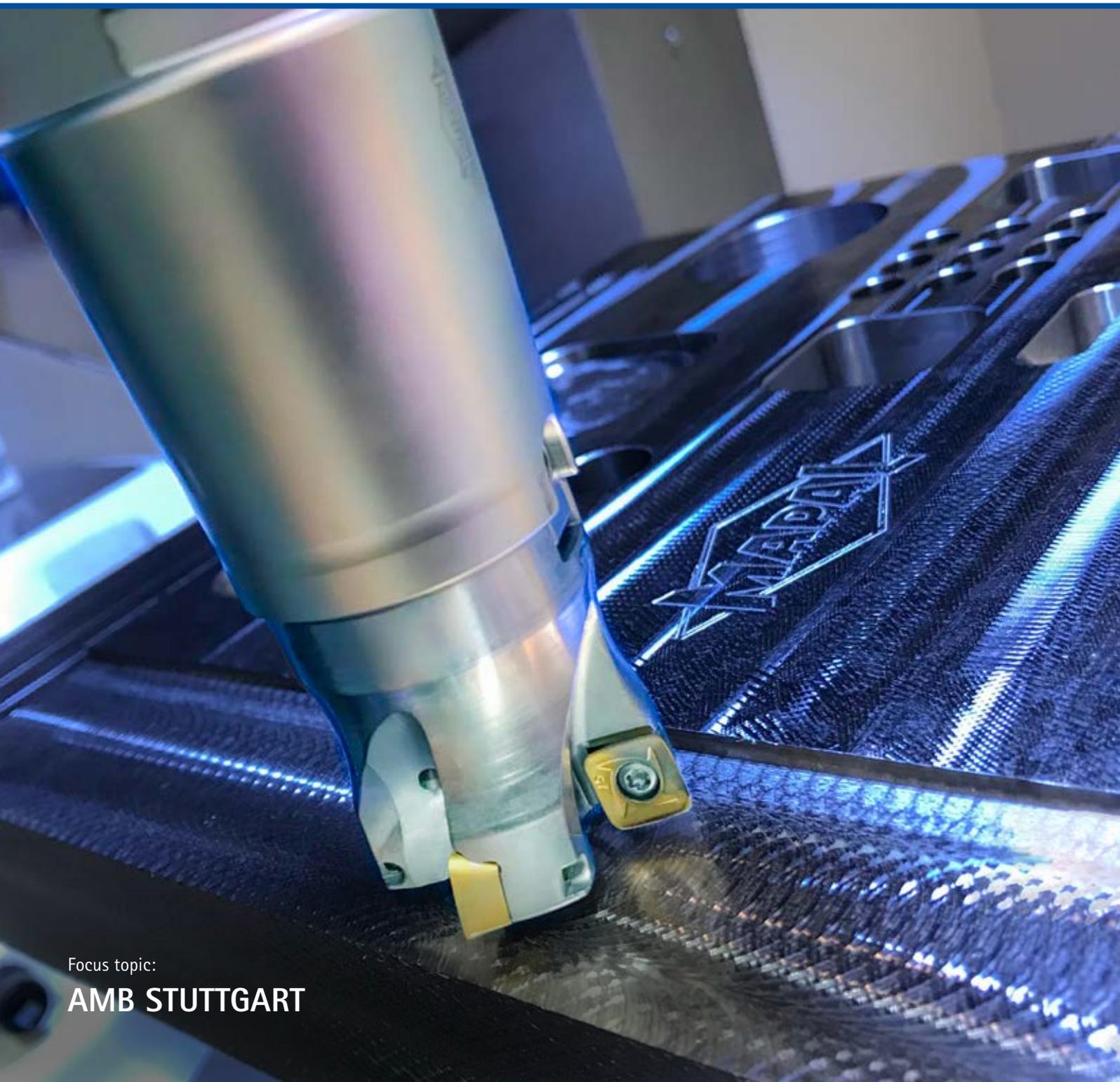




# IMPULSE

MAPAL TECHNOLOGY MAGAZINE | EDITION 79



Focus topic:  
**AMB STUTTGART**

**Dear business partners  
and readers,**

in light of the global economic and political developments and the challenges that come with them, we are working hard on future developments. Our traditional main market, the automotive industry, remains a key pillar of our market strategy. With the addition of the future field of electric mobility, MAPAL solutions are found in all areas of mobility. The market segments of aerospace, fluid power technology and the die & mould sector are also in focus. MAPAL has gained a strong foothold in fluid power technology with intelligent solutions. The market strategy for the die & mould sector has now been rolled out worldwide. The necessary stock availability of tools is in place and structures are set up accordingly. We're looking forward to the future with great optimism in this area. Across

all segments, the machining of titanium and aluminium also plays an important role in the market and product portfolio.

Our development and sales strategy, which is decidedly aimed towards the focus markets, already manifested itself in the 2021 financial year, and we were able to increase Group sales by 15 percent to 524 million euros. For the current year 2022, ongoing developments make it very difficult to make a reliable forecast. However, the fact that our future developments are beginning to bear fruit is cause for optimism.

We invest in several sites worldwide. With the completion of the construction work at the Altenstadt site, we have increased the pro-

duction space at the Centre of Competence for Solid Carbide Tools by 5,000 square metres, significantly improving the company's ability to react in the competitive market. We are also making extensive investments in Poland. A brand-new production and administration building has been constructed in India, meeting the latest ecological standards.

We will be exhibiting our new developments and solutions for focus topics at the AMB in Stuttgart. We look forward to meeting you there, to presenting our solutions for your machining tasks in detail and to getting the chance to speak to you.

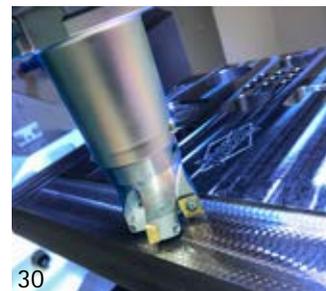
Have a good read!  
Yours,

Dr Jochen Kress



# CONTENTS

## FROM THE COMPANY



Particulars  
Pages 6-7

Conference week in Aalen  
Pages 20-23

MAPAL Technology Days  
at MAZAK in Leipzig  
Pages 30-31

Hofmann Consult:  
A wide range of technology  
Pages 40-41

In brief  
Pages 42-43



## TECHNOLOGY HIGHLIGHTS



MAPAL at the AMB 2022  
Pages 12–13

Innovations and  
focus topics at AMB  
Pages 14–15

Sights set firmly on supply  
chains and key components  
Pages 16–19

New face milling cutters  
for more sustainability  
in aluminium machining  
Pages 28–29

Green tools  
protect resources  
Pages 36–39



**FOCUS TOPIC:**  
AMB Stuttgart



## PRACTICE REPORTS



Rapid and secure tool setting with  
EasyAdjust-System  
Pages 8–11

Gewerbliche Schule Göppingen  
taps into MAPAL's digitalisation  
know-how  
Pages 24–27

Efficient processing  
with robots  
Pages 32–35



## IMPRINT

Editing: Andreas Enzenbach (Responsible according to the German Press Law), Patricia Müller, Oliver Munz, Sabine Raab, Kathrin Rehor, Tobias Zimmermann, Manfred Flohr, Klaus Vollrath  
Layout and design: Alexander Rückle

Publisher: MAPAL Präzisionswerkzeuge Dr. Kress KG  
P.O. Box 1520 | D-73405 Aalen | Phone +49 7361 585-0 | Fax +49 7361 585-1029 | info@mapal.com | https://mapal.com

Print: VVA, Austria | Circulation: 18.000 German, 9.500 English

© MAPAL Präzisionswerkzeuge Dr. Kress KG | Reproduction, even in part, only with the approval of the publisher.

## PARTICULARS



**MATTHIAS CÖSTER**  
CFO | MAPAL GROUP

Matthias Cöster (48) will join the executive board of MAPAL on 1 September 2022. As part of a succession plan, he will be responsible for the areas of Finance, Controlling, Purchasing and Facility Management as Chief Financial Officer (CFO). "We are pleased to have found in Matthias Cöster a personality who brings with him the ideal prerequisites for this task. We are convinced that Mr Cöster will make an important contribution to the further development of the MAPAL Group," says Dr Jochen Kress, President of the MAPAL Group.

Matthias Cöster, born in 1973, has a degree in European Business Administration and a European Master of Business Sciences. He looks back on 25 years of professional experience in various functions and industries, including 14 years as CFO in both mechanical engineering and logistics. Matthias Cöster also has a wide range of knowledge, particularly in the areas of finance and controlling.

**DR. GIOVANNI PIROZZI | CLAUDIO GABOS**  
MANAGEMENT | MAPAL ITALIA

Dr Giovanni Pirozzi (64), Managing Director at MAPAL Italy, will be taking his well-deserved retirement on 31 August 2022. Dr Pirozzi joined MAPAL in June 2000 as Commercial Director and was subsequently appointed Managing Director. He has successfully managed the company for 22 years. Together with Claudio Gabos, who was appointed to the management board at the end of 2017 and is responsible for sales, Dr Pirozzi has grown the company to its current size.

Claudio Gabos will take over the sole management of MAPAL Italy on 1 September 2022.



## DR KARIN JENUWEIN

CHRO | MAPAL GROUP

MAPAL focuses on a modern personnel development as well as on attractive and motivating working conditions. As part of the future orientation of the company group and in order to best meet the complex and challenging tasks in HR, the MAPAL Group is creating the new function of Chief Human Resources Officer (CHRO).

Dr Karin Jenuwein (48) will join the MAPAL Group as CHRO on 1 September 2022 and assume overall responsibility for Human Resources. As a member of the Executive Board, she is responsible for all HR topics in the MAPAL Group, including the areas of recruiting, training, academy and employer branding.

Dr Jenuwein brings with her extensive skills and wide-ranging knowledge in strategic and operational HR. She started in the consulting industry and spent important stages of her career at a well-known vehicle manufacturer with more than 30,000 employees. There she took on various management positions in human resources and was most recently Head of Global HR with power of attorney for the company group.

Dr Jenuwein holds a degree in business administration from the Ludwig-Maximilians-University in Munich in 2001 as the best graduate of her year in Information, Communication and Management. She completed her doctorate at the University of Regensburg in 2004 with distinction.

Dr Jochen Kress, President of the MAPAL Group: "I am very pleased that we have been able to gain an experienced and competent leader in Dr Karin Jenuwein. By anchoring the HR area in the executive board, we are setting a sign of appreciation for our 5,000 employees worldwide."



Rapid and secure tool setting with EasyAdjust-System

# Major progress in external reaming of turning workpieces



*A selection of turning workpieces produced in the Oberrindal plant operated by W. E. Schultz.*

© Klaus Vollrath



Happy faces, from left to right: Emil Hugentobler (Machine Fitter, W. E. Schultz), Andreas Mollet (Regional Sales Manager Switzerland, MAPAL), Patrick di Cataldo (Technical Consultant, MAPAL) and Alexander Jaksch (Deputy Head of Turning Shop, W. E. Schultz). © MAPAL

Mass production of precise turning workpieces on multi-spindle automated lathes is subject to its own rules. The highest component quality only guarantees admission to the competition. In a hotly contested market, every tiny opportunity for cost reduction must be taken. Optimum machine use therefore requires optimum tools. The example shown here illustrates the importance of assistance from an innovative tool manufacturer.

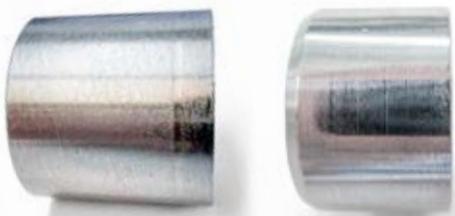
"We're part of MSMgroup, a group of companies specialising in magnetic actors and sensors, now in its fourth generation as an owner-run business, with around 2,700 employees worldwide," says Alexander Hildt, Head of Manufacturing at W. E. Schultz GmbH in Oberrindal (Switzerland). The company plant, in its idyllic rural surroundings, specialises in producing turning workpieces in large quantities. The components produced are intended for electromagnetic assemblies such as solenoid and switching magnets, magnet valves or sensors and actuators in a wide range of different fields of application. The company proudly points to components used to control a mini-helicopter for a NASA mission to Mars.

However, its everyday work involves mass production of ultra-precise parts by turning. These parts serve as the starting material for producing assemblies in the group's plants around the globe. End users come from industries such as the automotive industry, aerospace and machine and system engineering.

#### MASS PRODUCTION AT THE HIGHEST LEVEL OF QUALITY

"As a true mass producer of comparably simple parts, we have to be able to compete in terms of price and quality with competitors from Asia here in Switzerland," says Alexander Jaksch, Deputy Head of the Turning Shop. Accordingly, the busi-

ness must take advantage of every little opportunity to improve productivity, parts quality or economic efficiency. A key lever in this is the support of external partners such as suppliers of tools used. "Ultimately, the tools for a machine tool are as important as the tyres on a car," says Jaksch. A decisive factor in the machine tool's performance is also what happens in the contact area between the cutting edge and the part. That's why W. E. Schultz only uses tools for every workpiece that have been carefully optimised for this machining task. The potential that can be tapped into here has been demonstrated to decision-makers at W. E. Schultz by a custom tool developed and subsequently optimised by MAPAL. →



Comparison of the typical surface of a turning workpiece (left) with a sleeve finished using external reaming.



Pictures: Klaus Vollrath



1 Some turning workpieces still oiled straight from the machine.



2 The conventional tool for external reaming with three guide pads and the indexable insert with one cutting edge.



3 The cassette's flat bottom is the reference surface for quick and easy setting of the insert position.



4 The setting dimension can be found on the bottom of the cassette.

### A TURNING WORKPIECE THAT'S NOT AS SIMPLE AS IT LOOKS

"This project was about a part that seemed rather simple on the surface, a sleeve turned from solid with a diameter of almost 15 mm and a length of 10 mm," says Emil Hugentobler, Machine Fitter at the Oberrindal plant. The part is produced in quantities of around a million per year and is used in the adjustment mechanism of a modern car shock absorber system. It was manufactured economically using a slightly older multi-spindle automated lathe. However, there are two crucial sticking points here: on the one hand, with regard to the narrow diameter tolerance of 14.7 mm +12/-2 µm and on the other hand, the exceptionally low surface roughness of only Rz = 6 µm. Both specifications are actually no longer possible with the 30-year-old automated lathe used. Usually, fine machining of this kind would have to be done by grinding.

### EXTERNAL REAMING AS ALTERNATIVE

"In this situation we became aware of MAPAL's external reamers, particularly a custom tool for external reaming," recalls Alexander Hildt. The external reamer is equipped with three guide pads and an adjustable indexable insert. The key advantage of this solution is that the outer dimensions of the workpiece are represented by the inner dimensions of the tool. Machine-related influencing factors such as increased play in the machine kinematics or the bearing of the spindle or chuck, on the other hand, are practically irrelevant. The tool made it possible to reliably guarantee the required properties and to fulfil the production task satisfactorily.

### FOR THE LITTLE ISSUE OF ADJUSTMENT...

"However, there's hardly anything good in the world that turns out to be completely perfect on closer inspection," says Alexander Jaksch. The new tool worked incredibly well. However, due to its design, there were certain challenges in setting the indexable insert after a change or resetting if the desired dimension threatened to depart from the tolerance range. The employee responsible guided the indexable insert into the tool for clamping and adjusted it there. A measuring sensor also had to be inserted inside the tool and "reset to zero" at the guide pads. The probe was then moved to the cutting edge in order to set the desired protrusion on the very inside and the back taper on the outer edge of the insert, both with an accuracy in the µm range. This was made difficult by the severely restricted visibility in the narrow tool cavity. Accordingly, making tool setting easier to handle was right at the top of employees' wish lists.



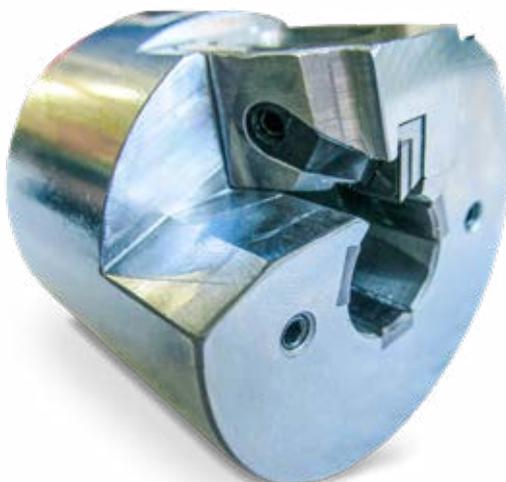
*Multi-spindle automated lathes stand side by side in the machine hall.*

### ...AN ELEGANT SOLUTION WAS FOUND

"In early 2019, our MAPAL technical consultant came to us with a new development," recalls Emil Hugentobler. The new external reaming tool is equipped with the EasyAdjust-System. In this solution for external machining of small diameters, the indexable insert is fixed in a cassette externally and set with a dial gauge in the simplest way possible. In the EasyAdjust-System, the contact surface in the cassette directly maps the back taper angle of the minor cutting edge, so that only the diameter has to be set manually. Setting is thus so easy and safe that any employee can perform it manually in just a few actions. Then all they need to do is insert and fasten the cassette in the tool – and it's done.

The new solution is particularly economical for W. E. Schultz, too, as Patrick Di Cataldo, Technical Consultant at MAPAL, highlights. Instead of the previous WP inserts with only one cutting edge,

significantly cheaper TEC indexable inserts with four cutting edges are now used. Thanks to the higher number of cutting edges, the TEC insert achieves four times the tool life. "This solution reduced our cutting costs to around 25 percent and our set-up costs to as little as around 10 percent of the previous values," says Alexander Jaksch with visible satisfaction. ■



*The new tool for external reaming with EasyAdjust-System features a cassette with a TEC indexable insert with four cutting edges.*

# MAPAL AT THE AMB 2022

Hall 1 | Booth D10



# AMB

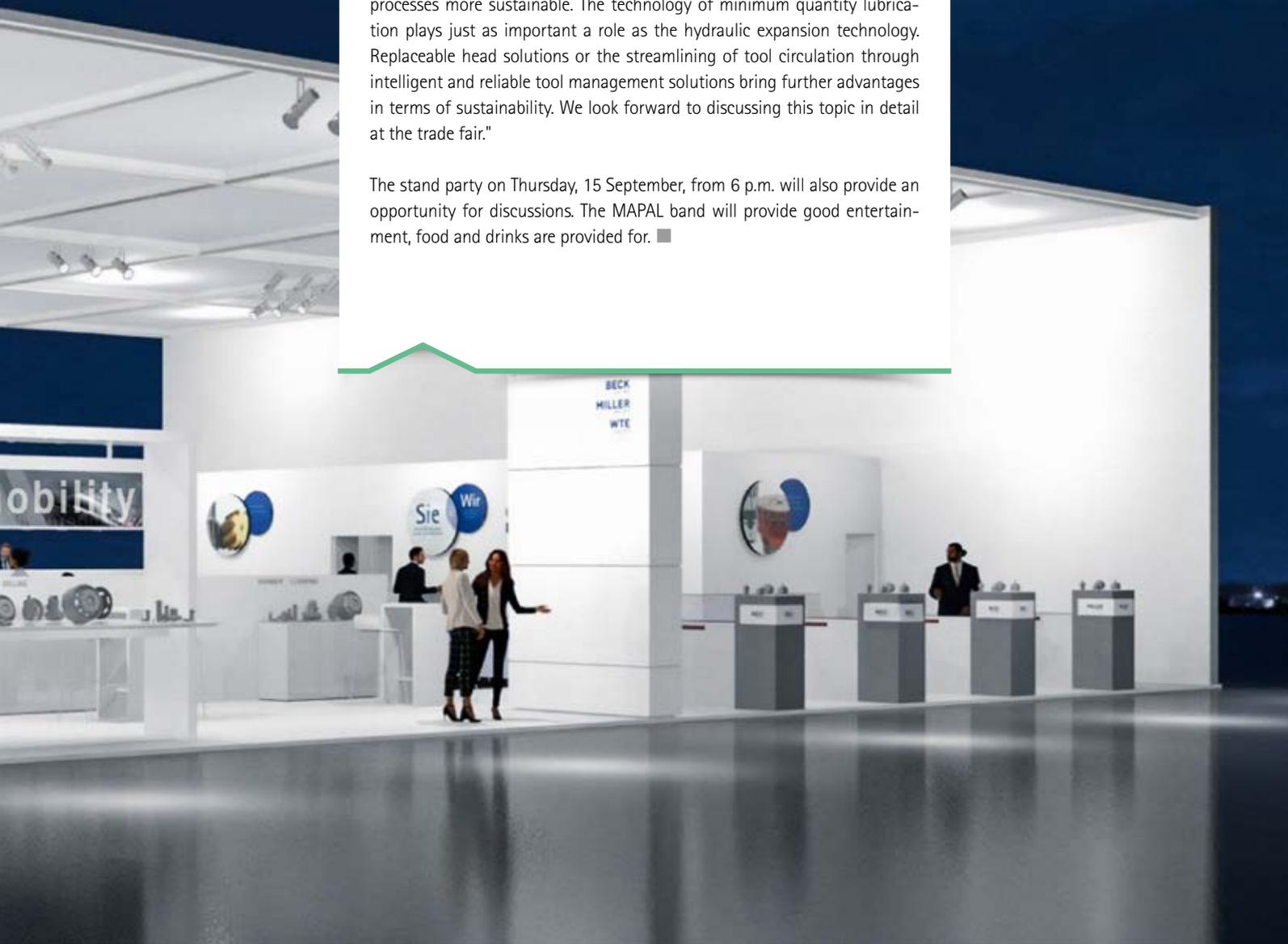
**International exhibition  
for metal working**

AMB will open its doors in Stuttgart from 13 to 17 September 2022 and is eagerly awaited. On a 390 square metre stand in Hall 1, Stand D10, MAPAL's trade fair presentation is clearly divided into the four focus sectors of automotive, aerospace, die and mould making and fluid power technology.

Siegfried Wendel, Chief Sales Officer, comments on the AMB presentation: "We have used the last two years very intensively and strategically realigned ourselves. We have formed a team for our defined focus industries and brought the product portfolio to market maturity. We will present the results of the new market strategy in full for the first time at the AMB.

Our customers' future investment plans will certainly also focus on the concept of sustainability. We are taking action in many areas to make machining processes more sustainable. The technology of minimum quantity lubrication plays just as important a role as the hydraulic expansion technology. Replaceable head solutions or the streamlining of tool circulation through intelligent and reliable tool management solutions bring further advantages in terms of sustainability. We look forward to discussing this topic in detail at the trade fair."

The stand party on Thursday, 15 September, from 6 p.m. will also provide an opportunity for discussions. The MAPAL band will provide good entertainment, food and drinks are provided for. ■



# Innovations and focus topics at AMB – a selection

All novelties and highlights are presented in the Innovations Brochure 2023 and on <https://mapal.com>.



1



## New cutting materials for reaming and fine boring, quickly available MN reamers

MAPAL presents the two new cutting materials HP016 and HP018. They are specially designed for the particular requirements of reaming and fine boring high-alloy and stainless steels as well as cast steel and hardened steel. The HP016 cutting material is suitable for all machining operations with a slightly interrupted cut, while the HP018 cutting material is used for continuous cutting conditions. Both are based on a silicon doped PVD coating on two different carbide grades with low cobalt content, which stands for extreme wear resistance and high dimensional accuracy.

The new cutting materials will be used for the market launch in the reamers of the MN series, among others. These tools stand for the very highest accuracies, can also be optimally used for hard reaming and for reaming stainless steel thanks to the new cutting materials and are now available within ten working days. They function according to the "MAPAL principle" - with one indexable insert and guide pads arranged around the circumference, which are made of carbide, cermet or PCD depending on the application.

2



## E-Mobility: Basic, Performance and Expert Solutions

Tool solutions for e-mobility are of particular importance in the automotive sector. For demanding components that will be produced in high quantities, MAPAL presents different machining levels: Basic, Performance and Expert. The new classification describes the different machining solutions depending on the quality requirements, number of units and investment. The Performance Line is aimed at series production and focuses on machining with special tools. It is mainly used when new components are to be produced efficiently and economically on existing systems.



3



### FaceMill-Diamond-ES and NeoMill-T-Finish increase economic efficiency in aluminium milling

MAPAL is expanding its aluminium milling programme with two new products. The FaceMill-Diamond-ES is a versatile all-rounder that ensures high economic efficiency and sustainable process reliability in demanding production conditions with smaller quantities and changing component types. The indexable insert milling cutters of the new NeoMill-T-Finish series provide a significant increase in the economy and efficiency of finish machining in series production. The finish milling cutter with exchangeable inserts functions according to the plug & play principle: customers change the inserts directly on site without having to adjust them afterwards. In addition, this also means that fewer tool bodies have to be kept in stock. What makes the new milling cutter unique is a patent-pending system of insert arrangement, which results in a homogeneous wear pattern of the cutting edges, longer tool life and thus a low cost per part.

4



### Titanium milling: NeoMill-2-HiFeed90 + OptiMill-Tro-Titan

The tool programme for titanium machining is expanded by two efficient milling tools. The five-edged trochoidal milling cutter OptiMill-Tro-Titan is characterised by maximum metal removal rate and shines with excellent surfaces due to unequal spacing and unequal pitch of the cutting edges. It is designed for trochoidal milling in partial cutting, trimming and for cutting depths up to 3xD. The new radial insert milling cutter NeoMill-4-HiFeed90 will be available as an end mill, screw-in milling cutter and milling cutter head from January 2023. The universally applicable high feed milling cutter stands for high productivity and is characterised by the highest stock removal rates, very high feed rates and large cutting depths.

## E-mobility

# Sights set firmly on supply chains and key components

MAPAL is joining the automotive industry on its path to electric mobility, confirms Matthias Winter, Global Head of Segment Management Automotive, in an interview. In his view, success requires an in-depth understanding of how parts function and the knowledge of where the components are made.



In the automotive industry, the transition to the electric vehicle is well under way. What does MAPAL's strategy for electric mobility look like?

MAPAL wants to be number one in electric mobility too – that's our clear strategy. To do this, we mustn't just focus on our tools – we have to move with the shift in the automotive industry. We examine the individual regions, as the pace of changes in the market varies dramatically from region to region. We use this to come up with forecasts to help us adapt our business accordingly and take a focused approach. The common thread is to proceed from the market to the components and finally to the necessary solutions. We want to get to know the new parts in detail and understand their function or key aspects so we can go in the relevant direction with our machining solutions.

Does MAPAL need to position itself differently to do this?

We will adapt our organisation in the automotive segment in line with the changes. That doesn't necessarily mean that we have to change completely, but we do need to take into account the fact that new players are entering the market and there may also be changes in the supply chain where the parts are ultimately produced. Accordingly, we also have to optimise our global network, both in terms of expertise as well as here and there in the organisation. To achieve that, we focus on internal and external communications. We provide our own employees with the relevant information via the network, but we also communicate outwardly that MAPAL is the right partner for this transition in the automotive business. As ever, our aim is to act as technology partner for the automotive industry.

How is the market developing?

Based on forecasts, we assume that battery-powered electric vehicles will attain a market share of around 30 percent by the end of the decade. The proportion of vehicles with combustion engines is gradually decreasing. Electric vehicles are already set to overtake combustion engines in Europe by 2029. Some manufacturers have made relatively large inroads, while others still face a bit of a learning curve. We aren't seeing a design freeze yet. Developments are continuing. As such, there's a certain variety in the design of drives and other systems.

What are the regional differences?

Worldwide, by 2029, there is set to be seven times as many battery-powered electric vehicles as there were in 2021, at around 30 million vehicles produced per year. However, on a regional level, change is occurring at different rates. The European market is predicted to grow to ten times its size, i.e. to over 10 million. That would be almost on a par with China. We're also expecting strong growth in Asia outside China with strong production markets in South Korea, Japan and India, and of course the US market is transforming too.

What does this mean for the tool market?

The distribution of machining between the combustion engine, electric drive, chassis, brakes and driveline, i.e. everything from the clutch to the wheel, will change dramatically in the next few years. Our strategy is to maintain our existing combustion engine business and expand it in some countries if possible. We'll continue to →



“We mustn't just focus on our tools – we have to move with the shift in the automotive industry.”

*Matthias Winter, Global Head of Segment Management Automotive at MAPAL*



iStock | gorodenkoff

invest in the chassis and brakes business, as ultimately, electric vehicles do need to be steered, braked and have a suspension too.

### During the transition to the electric car, can we expect more innovations in combustion engines?

Combustion engines won't die out overnight. Their efficiency is still being improved. They will remain an issue in many countries for a long time to come – even beyond Europe's target limit of 2035. Accordingly, aspects such as downsizing and turbocharging will continue to play a role in modern combustion engines, but it will largely be possible to cover production in existing facilities with appropriate re-tooling projects.

### New technology means new players on the market. How can they be reached?

Around 80 percent of battery-powered electric vehicles will come from the well-known automotive manufacturers. We're focusing more and more on the supply chain. Knowing where the parts come from is essential for our business. Industry is increasingly assigning tasks to component suppliers at tier 2 or tier 3 level. If automotive manufacturers don't have their own systems capability in specific areas, tier 1 suppliers handle the relevant production. For the electric drive, I presume these suppliers will play a major role in future. We have to understand the entire supply chain to make ourselves known to new players here. Of course, we also need to watch what's going on with our existing customers.

### Complex tools for highly efficient production of specific parts are MAPAL's major strength. Are they also in demand for electric vehicles?

Our entire product range is used in e-mobility as well. As a lot of aluminium is machined and the proportion of it used is also on the increase, our PCD tools are utilised a great deal. For MAPAL's guide pad technology for ultra-precise bores, we're finding areas of application, particularly in the motor. Our insert and shank tools are also used for milling and drilling. We are able to contribute our entire portfolio and also offer project management for complete parts as usual.

### Does MAPAL focus on specific parts?

When manufacturing a component, you have to master the key features, otherwise your component expertise is clearly lacking. The parts we have chosen to focus on have a specific machining volume and specific machining requirements. And we also have to be able to develop them with our technology. These parts are found in drives, in energy supply including energy handling and in thermal management. MAPAL tools are used to produce parts such as stator housing for electric motors, battery frames and parts for the scroll compressor.

### What are the special challenges of electric mobility for tool manufacturers?

Tolerances in e-mobility can be even tighter than those for current parts. One reason for this, for instance, is the narrow but constant air gap required between rotor and stator, which is neces-

sary for the efficiency of the electric motor. That requires an exact concentricity between these parts. Transmissions in electric vehicles may be comparatively simpler, but the gears must mesh at the optimal operating point, because any incorrect alignment would be immediately audible. In addition, the drive stages are exposed to unusually large forces, especially during recuperation. This leads to high shape and position tolerances which are required in manufacturing. In some areas they are within a range of just a few  $\mu\text{m}$ .

### Will the move to e-mobility entail switching production to minimum quantity lubrication?

We have already implemented MQL projects. Whether there will be another push towards completely dry production due to e-mobility and the increasing importance of sustainability remains to be seen. We are also technically capable of implementing this in series production with our tools.

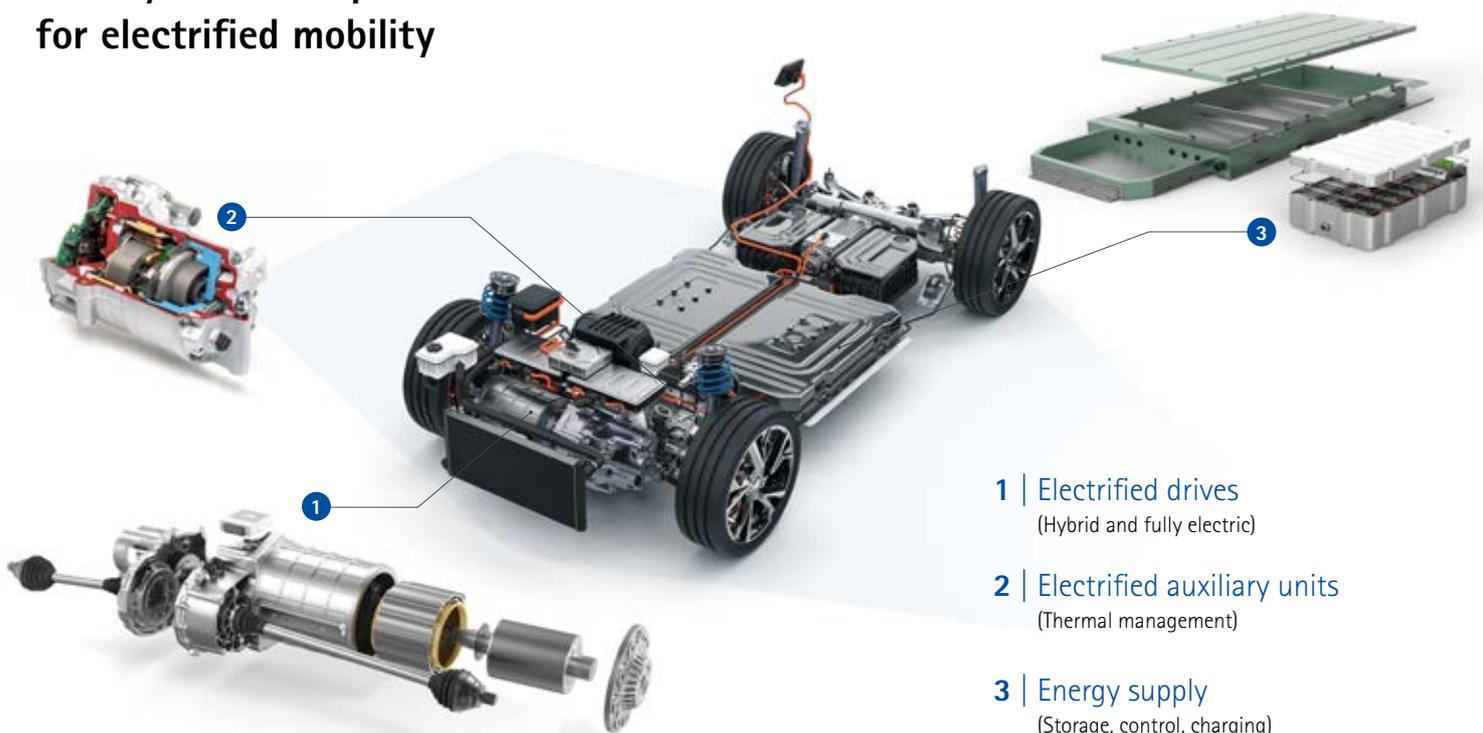
### E-mobility doesn't just mean cars. Is MAPAL involved in making electric bikes too?

Yes, although I'd tend to call this micromobility. It also includes electric scooters or rickshaws and similar vehicles in Asia. Standards for accuracy in the key bores and functional surfaces are often comparable with those for cars. In the premium segment, magnesium die-cast housings are sometimes also used in e-bikes. Here, the material properties pose an additional challenge for machining.

### What can we expect from MAPAL next in the area of e-mobility? What are you working on at the moment?

As in electric mobility, there's no design freeze in our portfolio of solutions either. With every project, we learn more and develop our tool solutions further. Always with the ambition of being number one, especially in the case of key components. ■

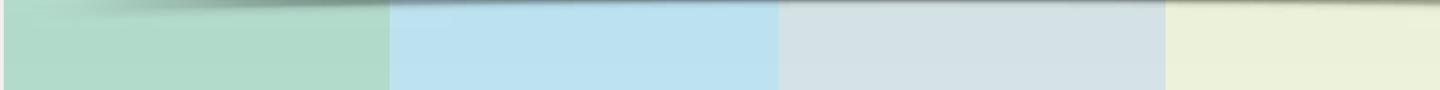
## New systems and parts for electrified mobility



**1 | Electrified drives**  
(Hybrid and fully electric)

**2 | Electrified auxiliary units**  
(Thermal management)

**3 | Energy supply**  
(Storage, control, charging)





Conference week in Aalen:

## **Business partners, journalists and representatives meet the experts from MAPAL**

For MAPAL, regular meetings and personal exchanges with representatives, business partners and journalists are part of the cooperation and the joint endeavour to provide users with information at the highest level. Now that the coronavirus situation is slowly easing and travelling is possible again, MAPAL invited to a round of meetings in Aalen in July. Andreas Enzenbach, Vice President Marketing and Corporate Communications: "A lot has happened at MAPAL over the past two years. Both in terms of organisation and in the market and product segments in which we have completely repositioned ourselves. Our engineers produced interesting new and further developments in tool technology. So it was high time to bring our representatives and business partners up to speed again." A good 200 invited guests were present at the respective events. They took away a lot of fresh knowledge regarding new products, technologies and trends and enjoyed many good conversations. "The conference was inspiring and greatly enriching for my daily work", was the positive conclusion of one participant. →



## INTERNATIONAL REPRESENTATIVES MEETING

MAPAL and the worldwide sales representatives in countries without a MAPAL site are linked by a close partnership. This is based on a lot of expertise and a trusting cooperation. Representatives from Europe, Israel, Turkey and Iran met for dialogue in Aalen. Current developments in MAPAL technology, new marketing concepts and tools for future cooperation were comprehensively presented to the country partners in theory and practice.

## DEALERS' DAY FOR THE DIE & MOULD SECTOR

Quo vadis for the die & mould sector? Around 20 authorised specialist dealers from the DACH-HU region discussed this issue with the responsible product and market segment managers from the MAPAL Group. It was the first meeting of this kind after MAPAL decided to enter this sector a good three years ago. Gerret Lukas, Head of Industrial Consulting at the WBA Aachener Werkzeugbau Akademie, illuminated the future prospects in the die & mould sector in an insightful presentation. Furthermore, digital solutions in tool organisation, high-performance solid carbide drills and milling cutters as well as the UNIQ hydraulic chuck were presented.

## PRESS CONFERENCE

22 representatives from German, Austrian and Swiss trade journals as well as the local media could again expect a dense mix of information paired with an evening programme at this year's press conference, which deepened the good friendships. Dr Jochen Kress reported on the business development in 2021 and gave an outlook on the current financial year. The presentation of new cutting materials for reaming and fine boring as well as solutions for aluminium and titanium machining, fluid power technology and e-mobility provided the journalists with plenty of material for their journalistic work. Feedback from one participant: "Super organisation, very well prepared lectures and lots of content."



## BRAND PARTNER DAY

A good two dozen trade representatives attended the brand partner conference in Aalen. For a whole day, everything revolved around innovations. In addition to technical presentations on new products and technologies, the focus was on application technology. The participating specialist dealers were given the opportunity to be one of the first to get to know the new products and to experience their performance live in MAPAL's research and development centre. During a group dinner, participants and speakers reviewed the impressions of the day and ended the day in a relaxed atmosphere.

## FIELD SERVICE STAFF MEETING

Field service staff are on the front line and need the latest information to advise customers accurately and efficiently. Experts from the main plant in Aalen, specialising in the sectors of titanium machining, fluid power technology, the die & mould and e-mobility, reported on their work in exciting technical presentations and demonstrated the latest machining concepts and products, including live machining in the R&D Centre. A lively exchange of experiences among the field service staff and professional discussions with the speakers followed. ■



# Learning to connect

Gewerbliche Schule Göppingen taps into MAPAL's digitalisation know-how



*Harald Wöhrle prefers to explain how crucial the right data is for machining, right at the machine itself. Pictured right: Manuel Boaretti, student technician.*

Equipping young people for the world of industry – that's Gewerbliche Schule Göppingen's mission. The commercial school teaches vocational students, student technicians and the foremen and women of the future. Their curriculums are adapted to current challenges – with digitalisation and industry 4.0 among the key themes. The school draws on MAPAL's products and know-how to offer the best learning environment in its own centre of competence for machining technology.



*Teaching at the setting fixture: Harald Wöhrle (left) discusses how to measure tools with budding technician Manuel Boaretti.*



The cooperation between MAPAL and the Gewerbliche Schule (GS) Göppingen was created in 2020 as part of a technical thesis project. "I was supervising a technical thesis project at Karl Walter Formen- und Kokillenbau GmbH & Co. KG in Göppingen," recalls Harald Wöhrle, a vocational school teacher responsible for the centre of competence for machining technology at the GS. That's where he first came into contact with MAPAL. After all, Walter Formenbau not only uses MAPAL's tools and chucks, but setting fixtures and c-Connect boxes for machine networking, too.

### THE IDEAL SETTING FIXTURE FOR THE SCHOOL

When it was time to acquire a setting fixture at the GS, Wöhrle therefore took MAPAL into consideration as a supplier. "To make a sound decision, I commissioned a technical thesis project. One of our budding technicians compared various setting fixtures and worked out the best device for us," explains Wöhrle. Sven Frank, Global Head of OEM Management at MAPAL, recalls: "The GS request for a setting fixture landed on my desk. Of course, we produced the right of-

fer for the school." MAPAL selected a UNISET-P equipped with many different features. "As it was a refurbished return model, we were able to offer it at an unbeatable price," explains Frank. After all, he says, it's incredibly important for the company to support young people's education and training. "If the newly qualified cutting machine operators, technicians and foremen and women remember our equipment in their businesses and become customers, that's a win for us," says Frank.

How the data is passed from the setting fixture to the machines and which solutions the market offers for this, also formed part of the technical thesis project. The setting fixture's properties were therefore not the only reason the technical thesis project ended up deciding a MAPAL device was the best solution for the GS. "MAPAL's digitalisation know-how impressed us," says Wöhrle. "Digitalisation and industry are huge topics for us. They've been an integral part of the curriculum for four years. For instance, we equip our technicians with iPads." →



Two of the EMCO machines are equipped with c-Connect boxes for transferring data via scan to the machine.

### INTEGRATING MACHINES INTO THE SYSTEM

Computer Aided Manufacturing (CAM) is part of every curriculum at the GS – for vocational students, student technicians and future foremen and women alike. Accurate data and integrating machines into the overall system are correspondingly important. For privacy reasons, however, machines and setting fixtures at the GS cannot be connected to the school network. "Our machines are from 2010 – they didn't have the prerequisites for connecting them to our system anyway," adds Wöhrle.

MAPAL therefore offers a solution alongside the UNISET-P that nevertheless allows machines to be connected to the setting fixture: barcode labels for the tools are printed on the UNISET-P. c-Connect boxes with scanners are connected to the machines in the centre of competence. This allows the barcodes to be scanned and labels to be read. The c-Connect boxes, which connect to the machine via USB, transfer the data.

"The solution is incredibly simple and works brilliantly for us. It's easy to use, we don't have to make complicated interventions in machine control, and the costs were well within budget," says Wöhrle with satisfaction. The machine operators – in this case, the school's students – no longer need to manually input anything into the machine.

### GS MAPS OUT THE ENTIRE MACHINING PROCESS

The results of a variety of project tasks that Harald Wöhrle set his students demonstrate how intensively cutting machine operators, technicians and foremen and women work with the setting fixture and c-Connect boxes today. Accordingly, a variety of different text and video guides on the setting fixture and how it is used at the GS have been created.

The setting fixture also fulfils its duties from a practical perspective. "Before the students machine their workpieces, they equip the machine accordingly. Before that, they measure the tools and adjust them if necessary. They transfer the data into the CAM system and simulate machining. Only then do they move onto actual machining at the machine." Just like in all manufacturing. Harald Wöhrle is particular proud of this: "We're mapping out the entire process here – including all calculations." This is why, for instance, the school operates a cutting database for all teachers and students to access. "That was another technical thesis project in which MAPAL was always on hand to help with any queries and issues," says Wöhrle.

### PLANS FOR TOOL MANAGEMENT

An expansion of the cooperation is therefore planned. "We'd like to build a tool management system, including test equipment management," says the teacher, looking to the future. "And MAPAL is predestined for that," says Sven Frank. Sebastian Kreller, Global Head of Tool Management at MAPAL, ran a workshop at the GS to give decision-makers and budding technicians at the GS a glimpse of MAPAL's tool management options.

"MAPAL has also impressed us in terms of tool management," says Wöhrle. After all, "unlike with other providers' dispensing systems and software, at MAPAL, it doesn't matter what's being managed. For instance, this would allow us to manage not just all our tools, irrespective of the manufacturer, but also our testing equipment, using UNIBASE software and the associated dispensing cabinets." A topic that Harald Wöhrle imagines could make a great technical thesis project. Exciting technical thesis projects and other projects are accordingly in the works for the GS in cooperation with MAPAL. ■



Sven Frank and Sebastian Kreller (standing, from left, both from MAPAL) present MAPAL's tool management at a workshop.



Consulting on future partner projects (from left): Sven Frank (MAPAL), Jürgen Wittlinger (Head of GS Göppingen) and Harald Wöhrle (teacher at GS Göppingen).



### **The UNISET-P**

*The UNISET-P is the perfect device for the optical and tactile measurement and adjustment of tools down to the very last  $\mu\text{m}$ . Its development focused on ergonomics. The greatest benefit compared with other setting fixtures is the very good accessibility to the tool. The portal construction creates the space necessary to allow optimum access to the setting systems on the tools. Measuring camera and back-light source are integrated into the pillars of the portal. Furthermore, this construction ensures high accuracy and is both mechanically and thermally stable. The UNISET-P has an extremely compact design, but nevertheless, practically all tools up to a diameter of 500 mm and a length of 600 mm can be measured and set optimally. It offers reflected light and transmitted light measurement for measuring tools of all kinds. With the axial measuring sensor, axial run-outs can be measured and set with  $\mu$  precision.*

### **Gewerbliche Schule Göppingen**

*The Gewerbliche Schule in Göppingen houses a vocational school for the metal, electronics and automotive industries, a technical high school, a foreman and a technician training school. A team of around 90 teaching staff work with the student population of around 2,000. The centre of competence for machining technology is a training partner of Siemens, holds advanced training courses for teachers and trainers for the young talent foundation for machine engineering and for various companies, and is the examination centre of the Chamber of Crafts for part 1 of the examination for cutting machine operators.*



*Budding technicians produce workpieces like these in the centre of competence for machining technology at Gewerbliche Schule Göppingen.*

New face milling cutters for more sustainability in aluminium machining

# Optimum surface finish for every quantity

When it comes to weight savings, aluminium is often the workpiece material of choice. Accordingly, in the automotive sector, for instance, many functional components are made from aluminium, such as cylinder heads, transmission housing, brakes, wheel carriers or electric motor housings. However, aluminium is also a sought-after workpiece material in many other sectors.



*At AMB 2022, MAPAL presents the FaceMill-Diamond-ES, an all-rounder for smaller quantities and changing part types, and the indexable insert milling cutter NeoMill-T-Finish for cost-effective finish machining in series production.*



With an extensive range of tools for reaming, drilling and milling and many years of process experience, MAPAL places a huge focus on aluminium machining. In milling, the PCD face milling cutters from the Power, Eco and FaceMill series are used for precise high-performance machining with high removal rates and special accuracy requirements in series production. With two new products, MAPAL is addressing additional customer requirements: The FaceMill-Diamond-ES is a versatile all-rounder that ensures high economic efficiency and lasting process reliability in demanding production conditions with smaller quantities and changing part types. The indexable insert milling cutters from the new NeoMill-T-Finish series ensure a dramatic increase in economic efficiency as well as efficiency in finishing in series production.

#### FACEMILL-DIAMOND-ES – THE VERSATILE PCD FACE MILLING CUTTER IS IDEAL FOR SMALL QUANTITIES

The new FaceMill-Diamond-ES is a versatile addition to the PCD face milling cutters in MAPAL's FaceMill-Diamond family. While the existing FaceMill-Diamond face milling cutters are established in the high-performance bracket in series production, the FaceMill-Diamond-ES now offers an entry-level version which is economically efficient to procure even for negligibly small quantities and varying parts and meets high standards in terms of surface finish.

The milling cutters have fewer cutting edges than the established FaceMill-Diamond tools, making them a more cost-effective and an "Economic Solution". With a diameter of 50 mm, for instance, the FaceMill-Diamond-ES has five cutting edges, while the classic FaceMill-Diamond has twelve. Another difference is the area of application: The FaceMill-Diamond-ES is suitable for shoulder milling, trimming and machining thin-walled parts, as well as face milling.

The new milling cutter is available in the diameter range of 32 to 80 mm. Dimensions have not changed in comparison to existing FaceMill-Diamond models. Accordingly, it can be used directly in existing production, if, for example, the larger chip space of the new tools should be used. Cutting depths of up to 10 mm are easily possible.

All milling cutters in the FaceMill-Diamond-ES series can be reground and re-equipped. They are exclusively available as milling cutters for arbor mounting.

#### NEOMILL-T-FINISH – FINISHING ALUMINIUM WITH INDEXABLE INSERTS

With the NeoMill-T-Finish, MAPAL presents a milling cutter with indexable inserts for face milling aluminium at high quantities for the first time. The finishing milling cutter with replaceable inserts functions according to the "plug and play" principle: Customers change the inserts on site without having to adjust them afterwards. This means that fewer tool bodies need to be kept on hand as a result.

With the new system, customers can also use other cutting materials in addition to the PCD-tipped inserts, depending on application and workpiece material, such as uncoated carbide or carbide with CVD diamond or PVD coating. This means the optimum cutting material can be used for aluminium workpiece materials with different silicon content and casting processes (sand casting, pressure die casting and permanent mould casting). The indexable inserts each have up to four usable cutting edges. An optimum version is available for every customer and every requirement, offering maximum economic efficiency and process reliability.

A patent-pending insert arrangement system is what makes the new milling cutter unique. The main inserts, which perform stock removal of up to 2.5 mm, are attached to the circumference. A

wide finishing insert arranged axially is responsible for the ability to reach surface roughness levels of  $R_z = 1.5 \mu\text{m}$ . The innovative system enables homogeneous wear and tear on the cutting edges: Thanks to the special arrangement of main inserts and wide finishing inserts, all main inserts have the same feed per tooth, smooth running for good surface quality and no burr formation. The resulting longer tool life is reflected in a lower cost per part with a high level of process reliability.

Each tool is adapted specifically to the customer's requirements. Maximum economic efficiency and productivity are the top priority. The tool body is usually made from steel. If weight restrictions are in place, MAPAL manufactures the tool body in aluminium or with a weight reduction bore. The NeoMill-T-Finish can be configured in the diameter range from 50 to 315 mm and can be ordered as a monolithic unit or an adaptive unit for milling holders with arbor. Cutting speeds of up to 6,000 m/min and feed rates of 2.5 mm per revolution are possible in use.

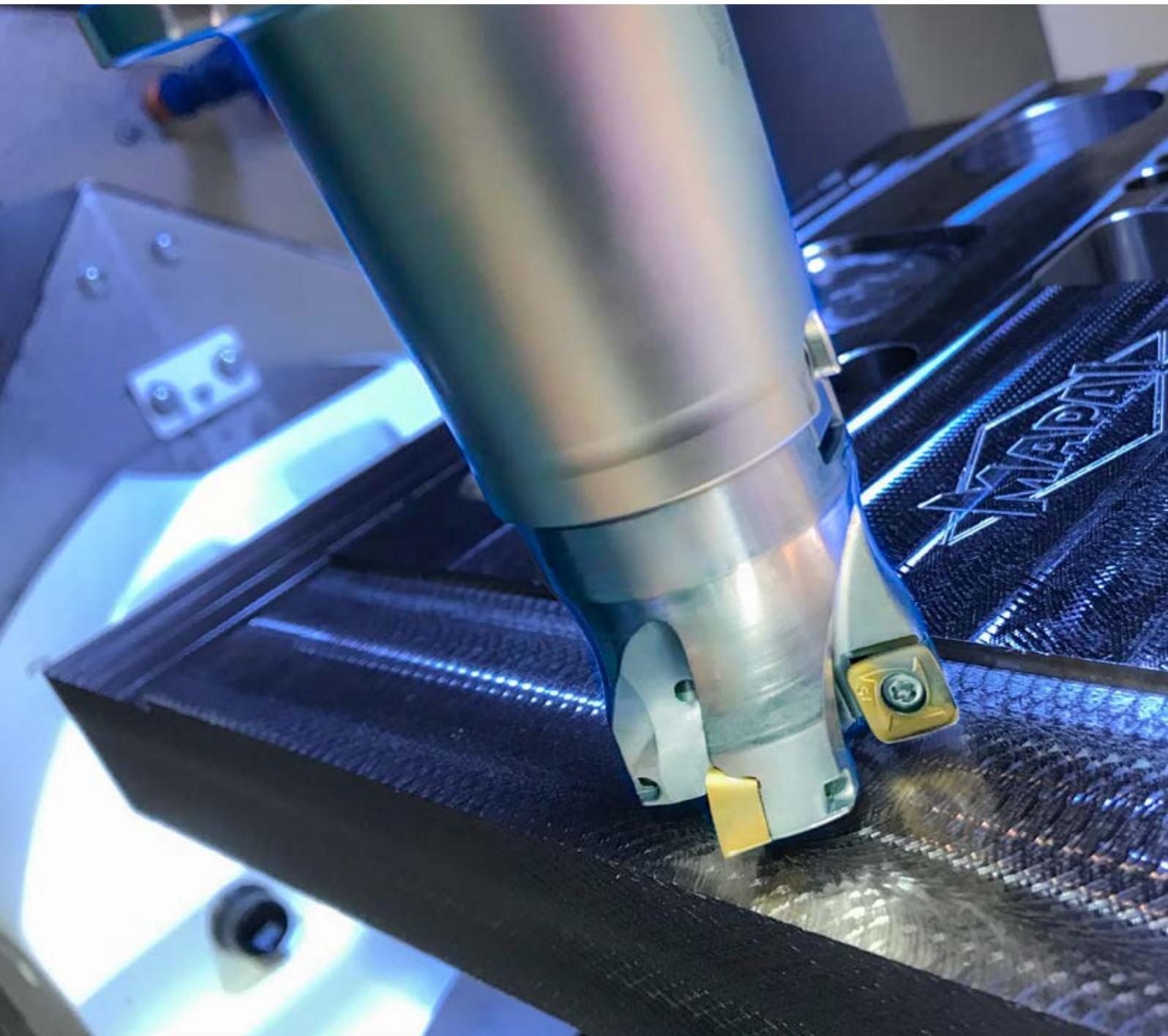
#### PRESENTATION AT THE AMB IN STUTTGART

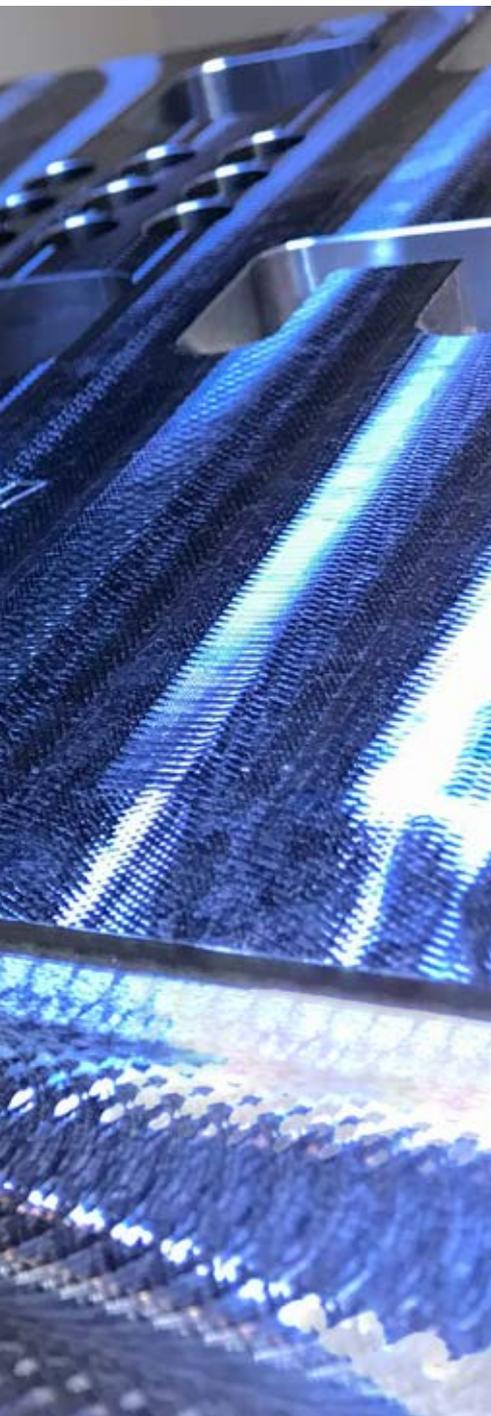
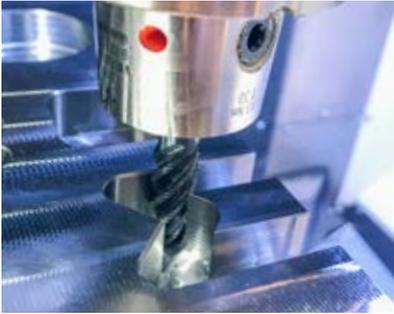
Both new milling cutter series for aluminium machining will be presented for the first time at the AMB 2022 in Stuttgart and are available from September 2022 (FaceMill-Diamond-ES) and January 2023 (NeoMill-T-Finish) respectively. ■

MAPAL Technology Days at MAZAK in Leipzig

# When the claim is proven directly on the machine ...

MAPAL invited customers from the central German region to MAZAK in Leipzig at the beginning of July to present the product areas of milling with indexable inserts, solid carbide tools and clamping technology in a very practical and close exchange. The event was a resounding success.





"My colleague André Ranke and I had been looking for an option for some time to demonstrate our milling and clamping programmes to customers and potential new customers", Sven Frank, Global Head of OEM Management, summarises the intention behind the Technology Days. Area Sales Manager André Ranke adds: "We have an intensive business relationship with MAZAK, so working together on this was an obvious choice. The Technology Centre in Leipzig offers the perfect conditions for holding a hybrid event consisting of lectures and live demonstrations. And that worked out wonderfully too."

50 visitors accepted the invitation to the two one-day events. The focus was primarily on solid carbide tools, the NeoMill milling programme

and the UNIQ chucks, with a sprinkling of both theory and practice. Each technical presentation by product specialists was immediately followed by "proof" demonstrated by corresponding live machining as well as further explanations in the accompanying display. Product specialists and technical advisors were available to answer questions, resulting in a very lively exchange.

"The feedback from the thoroughly mixed audience was very positive across the board", reports Frank. "Thanks to the location and the size of the event, we were able to tailor the Technology Days very individually and even received specific enquiries during the event." ■

KADIA system processes battery trays

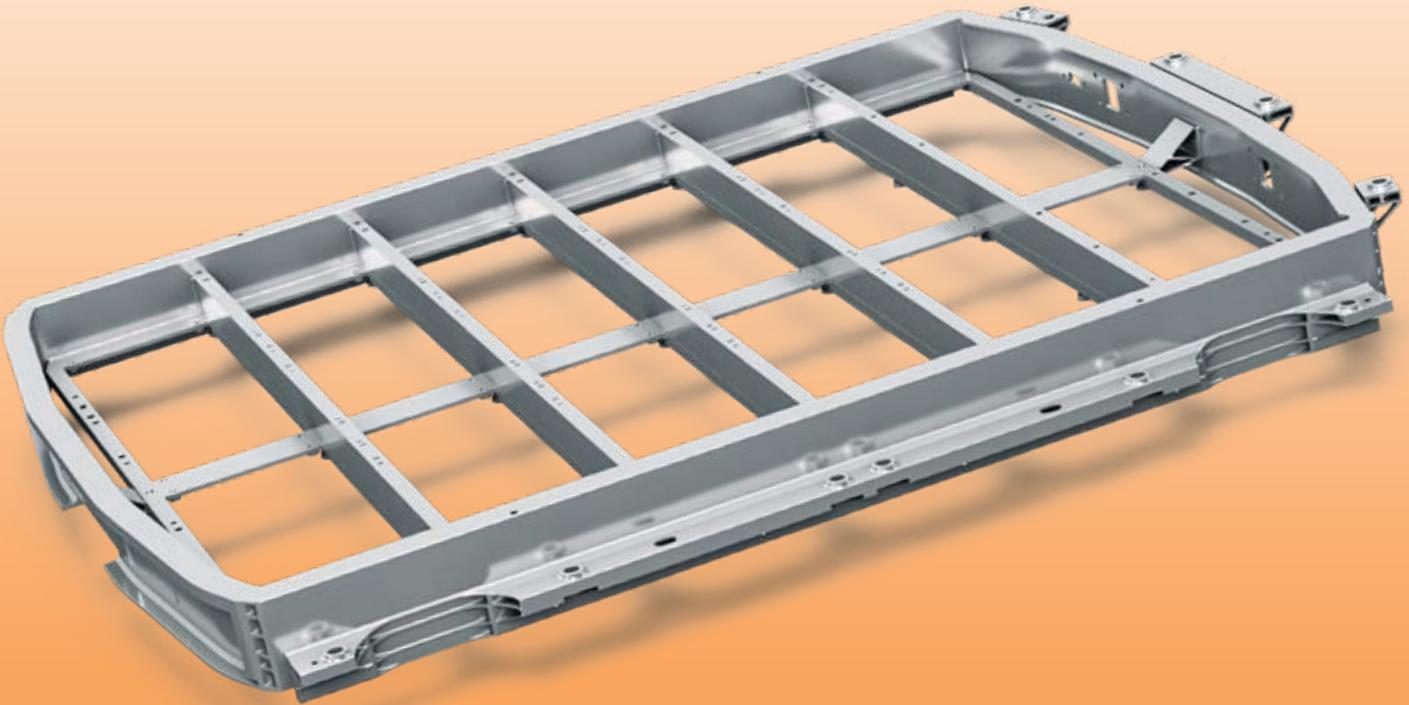
# Efficient processing with robots

If a milling cutter is guided by a robot, the machining is fundamentally more unstable than on a machining centre. To reliably ensure the shortest cycle times in industrial production in this instance, KADIA is using MAPAL's FlyCutter with three cutting edges in a newly developed system with three robots for deburring battery trays for electric vehicles.

Pictures: KADIA Produktion GmbH + Co.



*A dummy clamped in the test cell corresponds to half of an original part in its dimensions and material. In the tests, KADIA doesn't just determine the optimum cutting data, but also the most suitable position of the robot in relation to the workpiece.*



*The aluminium profile tray design is roughly the same size as a double bed frame and is used to hold batteries in an electric vehicle. The surfaces must be deburred by robots to ensure the lid fits cleanly and to ensure it remains tightly sealed after "closing".*

The story of Nürtingen-based KADIA Produktion GmbH + Co began back in 1959 with the production of honing tools. The first honing machines were developed ten years later. The company tapped into another branch of business in 1981 with the manufacture of deburring machines. Today, KADIA is a leading specialist in honing and deburring technology and currently employs 200 people.

Its main customers are car manufacturers and suppliers, construction and agricultural machinery manufacturers, wind power plant producers and the aerospace industry. While the manufacturer offers standard machinery in different sizes for honing, in principle, custom machines are built for deburring. Customers include major machine manufacturers that bring KADIA on board as a deburring expert.

### PENCIL TEST FOR BURRS

In mechanical machining, a distinction is made between loose and fixed burrs. After deburring, depending on what's required, the part should have sharp edges, edge rounding or a chamfer, which is why this is also known as edge design. To assess a burr, KADIA uses a simple but meaningful test using the lead of a mechanical pencil extended by five millimetres. If it can be used to remove the burr, then the burr is loose. If the lead breaks, it's a fixed burr, which needs to either be milled off or can be left in place, as it won't come off later.

The size of the workpiece is also crucial to machining processes that make use of robots. Guiding the workpiece is favoured for smaller parts. The robot guides the workpiece along fixed processing units. In a tool-guided strategy, the robot arm processes a workpiece firmly clamped in place. "For bigger workpieces, I'm much more skilful with the milling cutter in hand than if I have to move the bulky part," explains Jannik Weiss, Sales Specialist Deburring & Robotics at KADIA.

When a major car manufacturer requested a deburring machine for battery trays in electric vehicles, it soon became clear that the robot would have to guide the tools in this instance. The aluminium frame, welded together from extruded profiles, measures 1,900 x 1,400 x 100 mm. The requirements for KADIA involved milling the separating surfaces and then brushing the burrs created by the milling cutter so that the frames can later be bolted and sealed with a lid. Tasks of this nature are performed more efficiently and flexibly by a robot cell than a machining centre, especially as the surface finish requirements are moderate.

### MACHINING IN THE TEST CELL

The centrepiece of development at KADIA is a five-by-six-metre test cell with a six-axle industrial robot and a quick-release unit. This enables testing of what is set to go on to become the system. Preliminary tests determine the optimum cutting data and assess stability. The cell

is home to 15 changeable units. The robot has automated access with an action radius of 2.70 m to nine of these. Each unit represents a specific function that is used for machining a part. Typically, it consists of a motor spindle with a connection and a cutting tool.

A rotary table as the seventh axle is also part of the equipment of the test cell, which also has enough space to accommodate other systems, such as coolant supply or additional process units. At KADIA, several parts are equipped for various tests in the cell at the same time.

For initial preliminary tests on a dummy part for the battery tray, KADIA used a round-insert milling cutter already in stock in. The tool proved wholly unsuitable for the task. The vibrations that occurred were so severe that even the processing spindle was damaged. Even with low cutting values, the background noise during milling was still noticeable in the adjacent building.

With the task to deliver a suitable milling cutter for the aluminium housing, MAPAL was chosen as the partner of choice. "We evaluate in advance in which tool manufacturer we see the potential for cooperation," says Jannik Weiss. Although KADIA initially focuses on standard tools, it was a major plus for MAPAL that the tool manufacturer produces custom tools where necessary.



**TWO MILLING CUTTERS TO CHOOSE FROM**

KADIA already used this service in a previous project for which MAPAL developed a special hydraulic chuck. The services of the Aalen-based manufacturer came to be appreciated here. When Norbert Meier, Technical Consultant at MAPAL, was on site to deal with this chuck, the battery tray project was explained to him. Meier had solutions ready right away and brought two milling cutters from MAPAL's standard range with him on his next visit: the seven-blade face milling cutter IFM751 and the FlyCutter D63 with three cutting edges. Both milling cutters demonstrated they were up to the task in the tests, but to Jannik Weiss's amazement, the little three-blade milling cutter gave much better results: "What the FlyCutter did there was really great."

But Norbert Meier, who wanted to show the customer an alternative with the second milling cutter, had reckoned with this outcome. "We specially developed our FlyCutter for requirements like these," he explains. MAPAL developed the lightweight tool specifically for unstable machining requirements that occur in robot applications. It is optimised for small connections such as BT30. The innovative design and use of aluminium ensure the milling head is particularly lightweight. With the diameter of 63 millimetres used at KADIA, the PCD milling head, including milling inserts, weighs just 220 grams. The sensitive wedge adjustment make  $\mu$ -precise adjustment of the milling inserts possible. The dovetail guide and an additional worm screw ensure perfect seating and high accuracy of repetition for the assembly of the milling inserts. The special, ultra-positive cutting edge geome-

try means only weak forces are applied to the part and the tool spindle guided by the robot.

When machining the battery tray, accuracy down to the  $\mu\text{m}$  is not required. In fact, to ensure the sealant applied by the automotive manufacturer holds better, a certain rawness of the surface is needed. Only the waviness must not be too high. In the tests, the milling cutter was moved beyond the limit to determine up to which point chatter marks on the relatively thin part still lay within the required tolerance.

**CUTTING DATA AND POSITIONING ARE KEY**

"The crux of robot processing is the interplay between tool, fixture and robot," explains Norbert Meier. Rigidity is a fundamental issue in machining. The further the robot arm extends,



1



2



3



6

the more unstable the machining. That's why KADIA doesn't just test various cutting data, but also various positions for the robot, in front of or beside the workpiece.

In this case, the partners determined that the optimum cutting data for a spindle speed of 11,000 rpm was a feed of 0.16 m/s and material removal rate of 0.5 mm. The FlyCutter reliably delivered very good surface quality. KADIA incorporated this test data into the concept for the custom machine. The manufacturer therefore determined that the use of three robots in one cell would be the most cost-efficient solution for series production. While two share machining on the front side, the third works on the rear. In addition to the cutting data, KADIA delivers the customer with the duration of the machining steps and the cycle time that can be

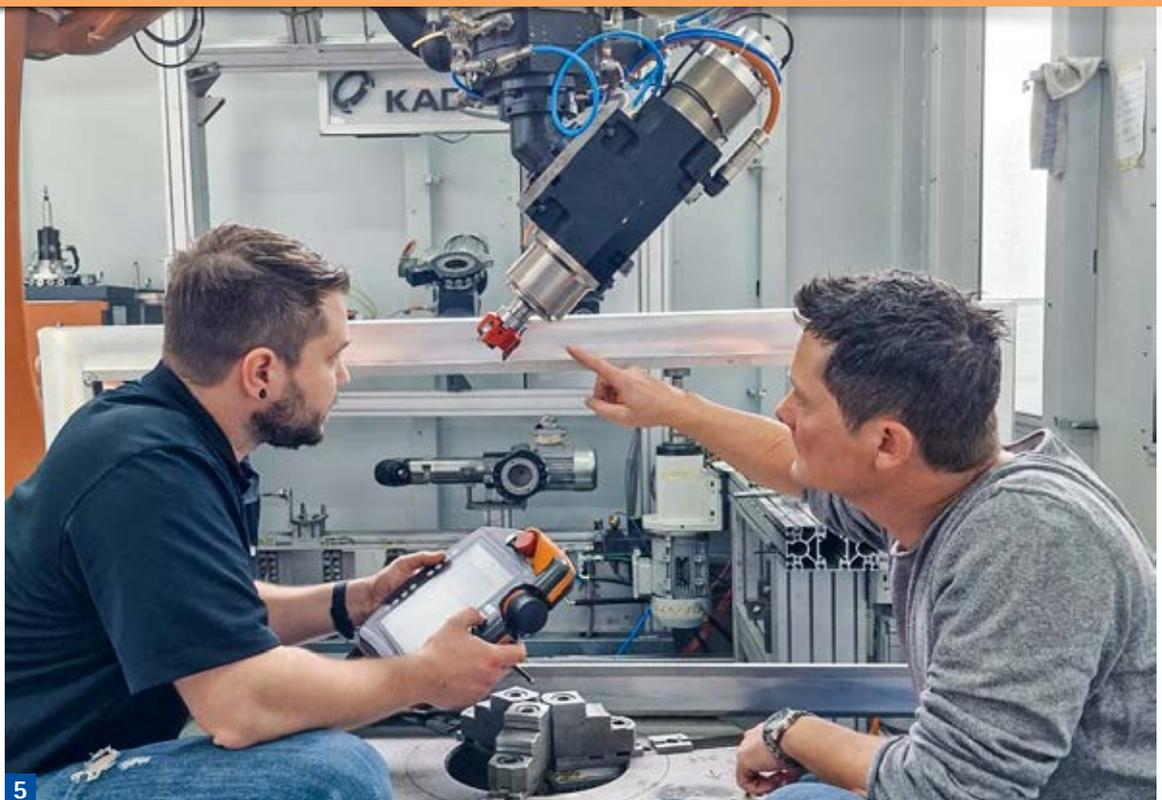
achieved. Accordingly, deburring a large battery tray will take around 80 seconds. "In a robot process, such process information on cutting data is not as standard as for a CNC machine. Depending on the robot's positioning, the same data generates different results," says Jannik Weiss.

Due to the thoroughly positive results, KADIA and MAPAL wish to deepen their cooperation. Further testing for various machining processes is already planned. ■

Pictures: KADIA Produktion GmbH + Co.



4



5

**1** A symbol of the transformation of mobility: In KADIA's test cell at the front, there is still a ship's engine block, while at the back, tests are carried out for the machining of a battery tray for electric vehicles. The robot takes the units required from the hopper.

**2** Some of the units are used for all kinds of different machining operations. Equipped with a solid carbide milling cutter, this 45° unit with its high-performance spindle is used to shape the edges of large gears. The robot provides the teeth with chamfers up to 5 mm.

**3** The further the robot arm extends, the greater the risk of vibration and chatter marks. Test series offer conclusions on cutting speed, feed and cutting depth for which a good surface is reliably produced with the milling cutter from MAPAL.

**4** The FlyCutter with PCD-tipped milling inserts was developed specifically for unstable machining processes and small connections.

**5** Jannik Weiss, Sales Specialist Deburring & Robotics at KADIA (left), and Norbert Meier, Technical Consultant at MAPAL, are very happy with the results of this joint project. © MAPAL

**6** The custom machine layout requires the use of three robots. Two deburr the front, while the third machines the back. This achieves the optimum cycle rate in industrial production.

Minimum quantity lubrication with MAPAL

# Green tools protect resources

With the advent of machining with minimum quantity lubrication (MQL) nearly 30 years ago, the appeal of this technology was its potential cost savings. Today, protecting resources, energy efficiency and an improved carbon footprint take centre stage. The use of MQL is particularly appealing for new manufacturing lines, such as for e-mobility.

To successfully implement MQL, all parts must be coordinated in the production process. The machine, MQL system, medium, workpiece material, clamping fixture, process sequence, extractor system, tool and clamping technology form one unit. MAPAL offers almost all its tools in versions for MQL too. The Aalen-based manufacturer marks tools and clamping tools suitable for this resource-saving use with a green label.

In these "green tools", the MQL connections and cooling channels are modified in such a way that the MQL medium is transported to the cutting and guide elements of the tools in a constant and flow-oriented manner. The outlets are closer to the cutting point and have steeper outlet angles than in tools for wet machining. To assist with chip removal, chip spaces in tools suitable for MQL are twisted, polished and made larger where necessary.

## LESS LUBRICANT MEANS LOWER ENERGY CONSUMPTION

By definition, an MQL process occurs when the total oil consumption of all tools used in a machining process, calculated to the process hour, is no more than 50 ml/h. Individual processing steps can be achieved with much smaller quantities. This means, for instance, that a solid carbide drill requires an oil quantity of just 0.002 ml for a bore. Examples from mass series production show that the consistent use of MQL technology can reduce consumption of fluids

containing oil by up to 98 percent. The pollution from cooling lubricants during manufacturing is thus also reduced, with the corresponding positive effects on the air and the working environment. In particular, fatty alcohols and synthetic esters are widely used as MQL oil. Both are classified as non-hazardous to water so that the environmental regulations for these oils are lower than for the normal water-miscible cooling lubricants.

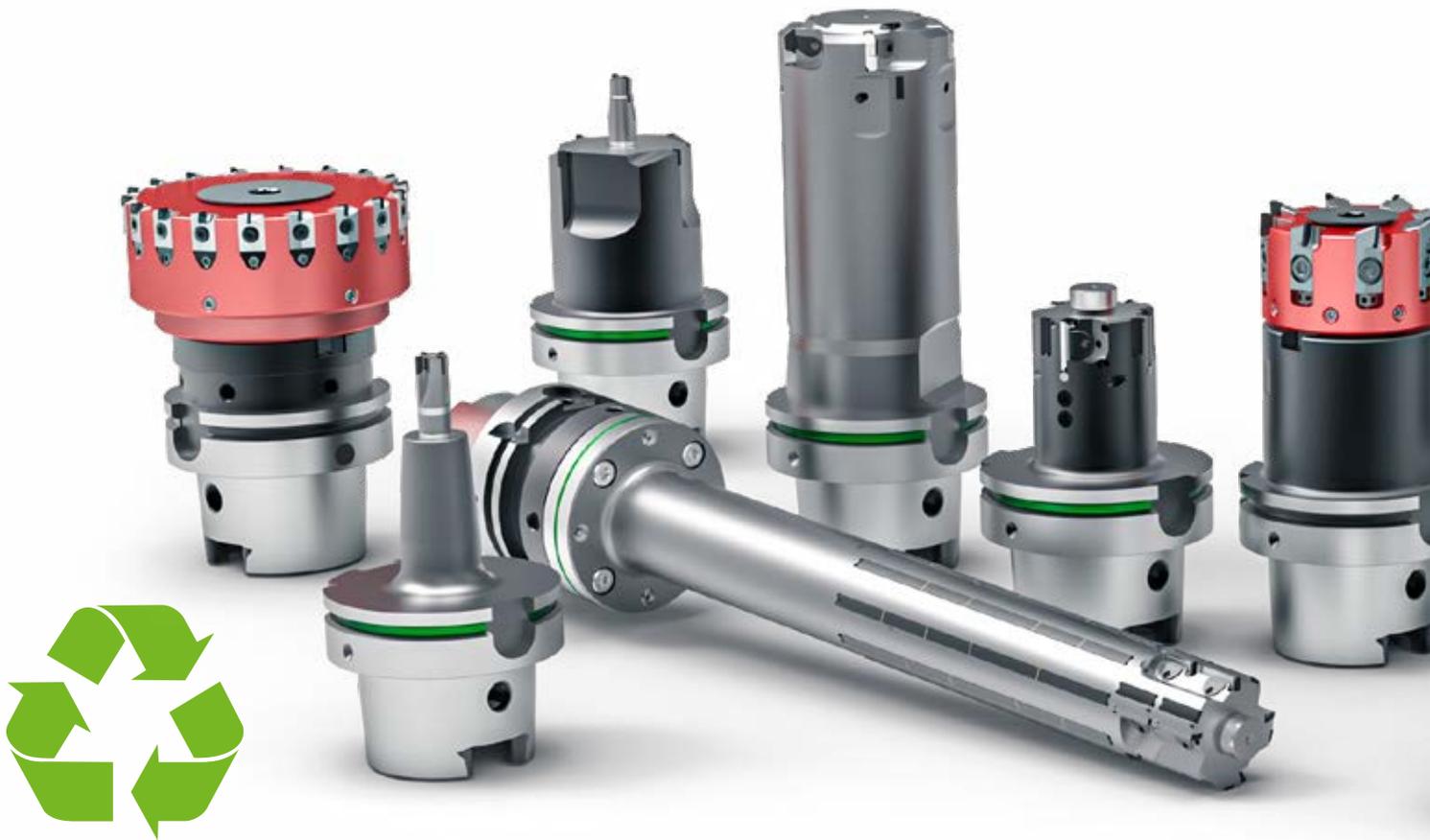
When using conventional cooling lubrication technology in a machining centre, its components high pressure, low pressure, return pump and high-pressure filter account for around 50 percent of all energy consumption in total. Even if the use of MQL technology increases use of compressed air, there is still potential for energy savings of up to 40 percent overall – a major improvement of the carbon footprint in production. Resource efficiency also includes demonstrably longer tool lives for tools used in MQL, particularly in machining aluminium. This is proven in particular by the avoidance of the thermoshock effect which occurs in wet machining.

MAPAL is currently noticing higher demand for processes with minimum quantity lubrication, particularly from countries in Asia. Here, protecting resources is a positive argument from the outset. No longer needing to process chips, but being able to continue processing them without cleaning procedure also makes workflows easier. →





*Fine boring tool for machining the stator bore with complex cooling channel guide optimised for MQL machining.*



In Germany, automotive manufacturers have been pushing the switch to MQL for some years now. However, a complete switch hasn't been achieved. First of all, in some areas, there are commercial reasons for continuing to operate existing machines, cooling pumps and processing facilities. There may also be established processes which are being continued.

However, when new manufacturing lines are being set up, MQL comes into play from the beginning. This applies in particular to electric mobility. The industry has a keen interest in also producing parts for eco-friendly vehicles in the most resource-efficient way possible, with low carbon emissions. MAPAL now also enables the use of MQL for complex precision tools which were initially not yet designed for this purpose.

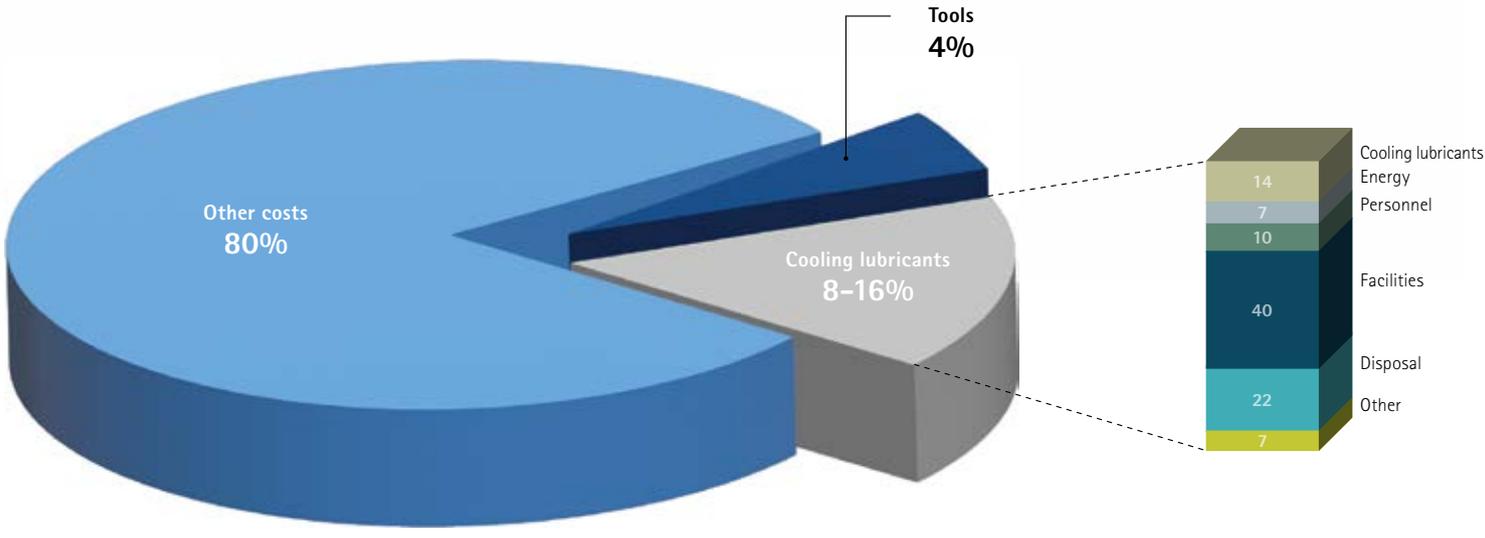
#### TOOLS FOR E-MOBILITY

One example is the tool for machining the stator bore on an electric motor. Its large machining diameter requires a complex cooling channel guide in the tool and an MQL medium flow angle that can be adapted to the point of action. MAPAL created the appropriate cooling channel guide in the tool with the help of additive manufacturing, among other aspects. The 3D printing and adapted transfer elements inside the tool allow all cutting and guide elements to be equally well supplied with MQL. As the process involves working with very low quantities of oil and large length to diameter ratios, sealed transfer points as well as non-sagging and flow-optimised cooling channels in the tool body are particularly important. Additive manufacturing, which is also used for other MQL tools, addi-

tionally allows for adjusted diameters for compressed air. This in turn has a positive impact on the energy footprint thanks to lower air volume consumption.

MQL technology is constantly developing. New, high-quality device generations from MQL system manufacturers, combined with high-quality fluids, ensure increasingly fine aerosols and/or oil-air mixtures. Furthermore, harmonisation between the MQL system and individual tools is optimised in order to be able to provide a precisely dosed oil quantity that meets requirements for every application. Machining with minimum quantity lubrication makes an even bigger contribution to sustainability in manufacturing companies as a result. ■

MAPAL offers virtually all its tools in versions for minimum quantity lubrication too.



Machining operations with minimum quantity lubrication is a notable lever for protecting resources in production.

Precision tools from MAPAL for Bulgaria

# Hofmann Consult: A wide range of technology

In Hofmann Consult, MAPAL has found a strong and skilled sales representative in Bulgaria. The cooperation began in 2019 and has enjoyed outstanding development.



*Hofmann Consult is regularly represented at the MachTech trade fair in Sofia. In 2022, the trade show will take place from 13 to 16 September.*

The trading company Hofmann Consult in Bulgaria has a high level of expertise in the distribution of technologically sophisticated products. Since 2019, the company has been one of MAPAL's 19 sales representatives worldwide. Despite a tough start due to the pandemic, the cooperation has proved promising for both parties. Based in Sofia, Hofmann Consult enjoys outstanding technical and human resources. The trading company employs around 20 staff and has a portfolio spanning products from over 30 global market-leading manufacturers. "The MAPAL tool range covers the spectrum of our customers' requirements perfectly," says Diana Hofmann, CEO of Hofmann Consult.

An informal cooperation has existed between Hofmann Consult and MAPAL for many years. Various customers were already supplied with MAPAL products before the sales representation was taken over. "So we didn't have to start from scratch in 2019," says Diana Hofmann – although she did face another challenge. Introducing pro-

ducts to a new market usually requires a lot of extra effort. At Hofmann Consult, the acquisition of new customers coincided with the beginning of the pandemic. There were only limited opportunities to make personal contacts and initiate business relationships. "But we took the crisis as an opportunity to take a very close look at our customers, their needs and how they do business," says Hofmann. Despite the difficult conditions at the start, the company managed to quickly find its feet in the relevant industries and achieve the desired sales targets in the precision tools sector.

A skilled and highly motivated team helps ensure the successful development of the distributor, which also has a consultancy office near Cologne. Sarah Hofmann is responsible for distributing MAPAL products. The CEO's daughter is assisted by a distribution team of two, who focus exclusively on distribution and logistics for MAPAL products. There is a wide spectrum of customers: users come from machine engineering, the die & mould sector and automotive and aerospace in-

dustries. The hydraulics industry also has high demand for effective precision tools. "This is a strongly developed market in Bulgaria and it still has a lot of potential for growth," explains Hofmann.

The sales representative is proud to have tapped into a large customer base who feel closely connected to the company with a varied product range. Alongside leading manufacturers, it also includes small businesses "who place their trust in our technological advice," as Hofmann adds. The team in Bulgaria works with MAPAL to develop custom solutions and tailored tool concepts. Experts from both companies are also on hand to support customers in process implementation. "We want to prove to users that using high-quality precision tools is worth their while. After all, higher productivity and accuracy in machining workpiece materials will pay off for them in the end," says Hofmann. Many projects have proven this, adds the CEO. She places a strong emphasis on optimum customer care. Accordingly, the trading company also sets benchmarks for service



*Sarah Hofmann successfully took part in a product training course at the MAPAL Academy in Aalen. Dr Jochen Kress congratulated her and presented her with the certificate.*

and constantly invests in the company headquarters in Sofia. In 2021, its storage, exhibition and manufacturing capacity was expanded. "This puts us in a position to supply our Bulgarian customers at short notice from our Sofia warehouse" explains Hofmann. The distributor is certified in accordance with ISO 9001:2008 and operates an ultra-modern technology centre for resharpening and coating solid carbide and HSS tools. ■

### **Profile Hofmann Consult**

*Hofmann Consult was founded in Cologne in 1992, initially as a consulting firm for the Bulgarian market. A year later, a commercial presence was established in Sofia, Bulgaria. Qualified engineer Diana Hofmann runs the business. In 2003 Hofmann Consult moved into one of the most modern industrial areas on the outskirts of Sofia and opened an 800-square-metre premises. In 2021, it expanded its storage, exhibition and production areas.*



*The company building in Sofia.*



*The team of Hofmann Consult.*

## IN BRIEF



### Dealers' Day in Italy

After a long break, a Dealers' Day was held again in Gessate, seat of MAPAL Italia. The Italian customers were invited to the presentation of the innovations and to network. Claudio Gabos, Managing Director MAPAL Italia, and Heiko Heinisch, Global Head of Trade of the MAPAL Group, provided information about the new technical developments and presented the current tool portfolio and the new catalogues. Afterwards, the participants got the opportunity to ask questions and talk to each other. A meal together rounded off the well-attended dealer day.

### Typification campaign

Together in the fight against blood cancer: In June, a typification campaign was held at the MAPAL headquarters in Aalen in aid of the DKMS (formerly the German Bone Marrow Donor Centre). 70 employees took part in the campaign and registered as potential stem cell donors. The case of a sick boy had prompted the management and works' council to support the search for a suitable donor. MAPAL bore the costs of the typification campaign.





## The MAPAL training centre in Aalen opened up for visitors

Under the motto "#PartOfMyFuture", MAPAL invited people to a training centre open house in July. Pupils as well as parents and teachers from the entire Ostalbkreis district visited the main plant in Aalen and found out about the training options on offer. Trainers and trainees offered the young visitors exciting insights into practical training and presented the training process and career prospects at MAPAL.

Many CNC-controlled machines were in operation, which the young visitors inspected closely with great interest. The hands-on activities also proved popular, such as a dispensing machine that had sweets ready when the drawer opened. During their tour of the 2,500-square-metre training centre, the young people were able to get an idea of how much basic knowledge is taught in addition to practical experience. The training centre has its own training rooms for this purpose. And anyone who wanted to was also allowed to start learning right away and take part in a job application training.

MAPAL will continue to be highly committed to training and apprenticeships. **At the moment, more than 300 young people complete an apprenticeship at one of MAPAL's sites worldwide.** The application phase for the 2023 training year has already begun.



