EDITION 68

MAPAL TECHNOLOGY MAGAZINE

IMPULSE

FROM THE COMPANY

TECHNOLOGY HIGHLIGHTS

PRACTICE REPORTS

Cover story:
Mobility in transition
New challenges, new solutions

Dear readers and business associates,

first of all, I would like to take this opportunity to wish you health, happiness and success in 2019. I would also like to express my gratitude. Thanks to you and your trust in us, 2018 has been a very respectable year for MAPAL. We have achieved the goals that we set ourselves.

This time of year provides an occasion not only to reflect on the past year, but also to look to the future. We have set ourselves ambitious targets that will keep us busy in 2019. One of the highlights of the year for us will undoubtedly be Moulding Expo in May. MAPAL will be there to showcase an extensive range of products for the tool and mould making industry. One of our stated aims is to intensify our efforts in this field, and we are pursuing a systematic approach to doing so. We intend not just to supply our customers with tools for milling, drilling and reaming, but also to provide them with the clamping technology and full range of digital tool logistics to match, as

well as other services. This way, we can offer our customers everything under one roof.

Alongside tool and mould making and our activities relating to electric vehicles, another priority is on digitalisation and thus our start-up, c-Com. Our subsidiary has extended focus. We have seen in practice what many companies are lacking, especially small companies, and that is an easy entry opportunity to the digital market. That is what we are working on with c-Com, offering a range of modules that enable companies to get started in this arena. These include a module for efficient regrinding handling and the new c-Connect Box to make machine monitoring easy.

2019 is certainly going to be an interesting year, both economically and politically. Whatever the New Year brings, I look forward to sharing some exciting projects with you.

Yours,

Dr Jochen Kress

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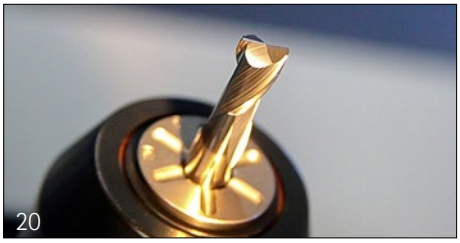

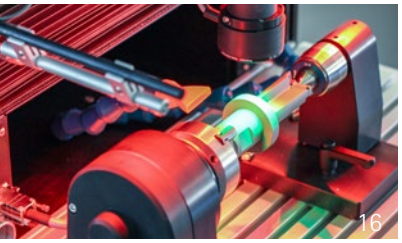

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MOBILITY IN TRANSITION

New challenges, new solutions

Electric motors and other elements of electric vehicles are components to which vehicle manufacturers and their suppliers have been devoting considerable attention for some time now. Designing new parts and manufacturing them in a way that is suitable for series production often present a challenge, and the tight tolerances require call for specialist expertise. In 2017, MAPAL worked with machine tool manufacturer HELLER to overcome just such a challenge and to get manufacturing processes for a newly designed stator housing ready for series production.

In 2017, German machine tool manufacturer HELLER received an enquiry to design and offer the complete machining process for a newly designed stator housing, including machinery, tools, process, fixtures and all corresponding data. The end customer set a tight deadline for the work. The requirements on the component were highly demanding, and the tolerances very tight. "This special stator housing was a completely new part to everyone involved, including our customer," recall Dietmar Stehle and Tobias Schur, who are responsible for fixtures and tools and for tool design, respectively, in this area at HELLER.

Already during the preparation of the quotation, HELLER involved MAPAL as the tool supplier. "When it came to implementing this project, Dietmar Stehle and Tobias Schur came to us very early on," says Norbert Meier, responsible member of the sales force at MAPAL. With new parts in particular, making sure that all parts fit together well is of paramount importance, according to Stehle. Together, HELLER and MAPAL designed the complete process for the machining of the new component. One advantage was, having worked together for decades, the two companies were able to tackle the task as a well-coordinated team. They investigated the tool design that MAPAL had proposed and examined the process. "Working together, we found the ideal tool design for machining," says Norbert Meier. They did so under enormous time pressure; as Stehle recalls, "For this job, we had to deliver the first prototypes very quickly indeed." This was in spite of the fact that they were still putting the finishing touches on the casting process for the part.

STATOR BORE AS THE GREATEST CHALLENGE

Machining the main bore for the stator housing – the stator bore – proved to be the greatest challenge of the entire manufacturing process. The process-reliable and cost-effective finish-machining of deep bores with large diameters is one of MAPAL's key competitive differentiators. The tool manufacturer with strong ties to the automotive industry gained this expertise through decades of experience in fields such as machining gear housings. "We took our expertise and applied it to the requirements for the stator housing," explains Meier.

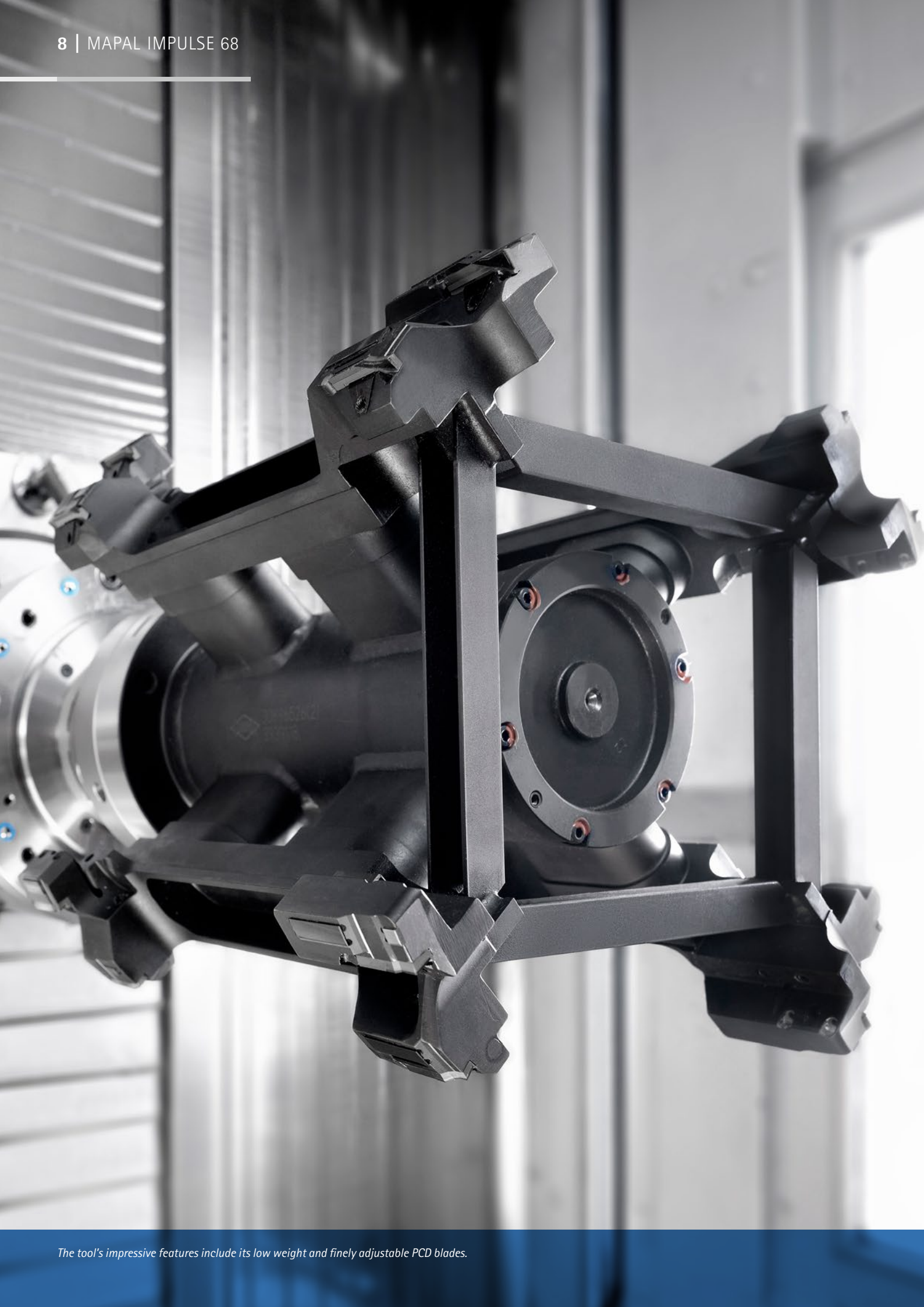
For the collaborative project, MAPAL opted for lightweight and yet extremely robust tools in welded design that are ideally suited for the machining of the thin-walled housing. Despite the long projection length and the large diameter of more than 250 mm, the tool is highly accurate.

LIGHT WEIGHT THANKS TO TUBULAR DESIGN

For tools with "welded designs", a tubular design is used for the tool body. These tools only have half the weight of a conventional boring bar. The carriers for the blades and the guide pads are welded on and support each other by means of connection ribs. This minimises the risk of chattering. It also ensures support during interrupted cuts. The resistance to bending is excellent thanks to the tubular design and the stabilising ribs.

"We split the machining of the main bore into three operations – pre-machining, semi-finishing and fine machining," explains Norbert Meier. In ➔

To manufacture the main bore of the stator housing accurately down to the micrometre, it is machined with a fine boring tool from MAPAL. (All images: HELLER)



The tool's impressive features include its low weight and finely adjustable PCD blades.

the final stage, the main bore is machined to µm accuracy, using the fine boring tool in welded design. "The PCD-tipped blades are finely adjustable to achieve maximum accuracy," says Meier. Guide pads support the tool in the bore.

SUCCESSFUL IMPLEMENTATION IN SERIES PRODUCTION

As for the stator bore, the machine and the tool manufacturers' experts found appropriate solutions for all other machining operations. "Together, we demonstrated not only that completely machining the workpiece within the specified tolerances worked well, but also that the solution we found allows reliable manufacturing within the cycle times required," says Dietmar Stehle with satisfaction. Apart from proving that the complete machining of the workpiece could be done within the specified tolerances, the partners were able to demonstrate that their joint solution enables process-capable manufacturing within the predefined cycle times.

Both HELLER and MAPAL gained sustainable know-how during the joint project, resulting in entirely new tool solutions, including self-aligning tools, allowing to achieve the required positional tolerances resulting from the necessary flip-over machining of the component. As a result, both companies succeeded in designing the perfect production process in the first expansion stage. Today, the customer manufactures a 5-digit production volume of the stator housing. ■

ABOUT HELLER

HELLER, established in Nürtingen in 1894, develops and produces machine tools and manufacturing systems for machining and employs 2,580 people. Its products include four- and five-axis machining centres, turning/milling centres, machinery for crankshaft and camshaft machining and flexible manufacturing systems, as well as a range of modular services.

HELLER specialists (from right) Tobias Schur and Dietmar Stehle worked with Norbert Meier from MAPAL to determine the ideal tools.

The combination of the HELLER machining centre and tools from MAPAL runs smoothly in series production.

DIGITIZING
ONE STEP AT A TIME

How do machining companies manage to digitalise their manufacturing processes without significant investment? How do they reap the benefits of connectivity without a complete overhaul of their existing machinery? And how can they reliably transfer data without having to interrupt production for too long? c-Com has the answer, and its name is c-Connect.

c-Com is an open cloud platform that interconnects the entire supply chain and makes data available to all involved. Information regarding tools and machinery is transferred to the cloud via RFID chips and DNC servers. Manual data transfer is not necessary. This, or something like it, represents the ideal scenario for connected manufacturing. Yet it is a scenario that only rarely reflects reality because systematic connectivity usually tends to involve considerable investment. c-Com has developed the c-Connect module, including a box of the same name, for companies wishing to go digital without incurring high costs.

Customers will find that using c-Connect will pay for itself many times over. "Using c-Connect, tool measuring data can be transferred digitally from the setting fixture to the machine, including registration of stock movements. In addition, thanks to various sensors, the c-Connect box can be used to monitor aspects such as machine status," says Giari Fiorucci, Managing Director of c-Com GmbH.

This involves mounting a c-Connect box on every machine and linking the two via USB – a quick and easy process. "Machine parks with very different machinery can be connected rapidly and without any fuss," says Fiorucci. After all, c-Connect is compatible with all common machine controllers and thus represents an affordable entry model for digitalisation in the field of machining. And it also has plenty of potential for expansion, as Giari Fiorucci explains: "c-Connect leaves all options open. The level of digitalisation can be increased gradually. For example, all the benefits offered by other c-Com modules can be integrated." ➔

Time-consuming manual data transfer

Manual data transfer

- Transfer error
- Time-consuming
- Incorrect measuring data lead to defective parts

DIRECTLY TRANSFERRING MEASURING DATA

While RFID chips and DNC servers are normally used in large-scale series production, at smaller companies, relevant measuring data are often transferred via manual input from the setting fixture to the machine tool. This process is not only time-consuming but also prone to error and can, in the worst case, result in damage to tools, machinery or parts. c-Connect eliminates such errors entirely. The setting fixture measures the tool, and, from there, the measuring data are automatically transferred to the c-Com platform. After scanning the tool at the machine, the c-Connect box takes the measuring data from c-Com and transfers them to the machine tool at the touch of a button. Not only does this eliminate errors, but it also saves on unnecessary non-productive time. "Another benefit is that stock movements are registered on the c-Com platform. It is also possible to obtain data such as tool life or reason for replacement in c-Com when a tool is taken out of service; in other words, to digitalise the tool operation card," adds Fiorucci.

Digital data transfer with c-Connect box

Data transfer at the touch of a button
The c-Connect box automatically loads the measuring data from c-Com and forwards them via USB to the machine at the touch of a button

Digital data transfer

- No additional processing effort required
- No manual input
- No transfer errors
- Shorter non-productive times

Machine monitoring

Status monitoring
The c-Connect box sends the machine status to c-Com

Notifications
c-Com sends a push notification containing the machine status to the user's device

MONITORING THE MACHINE

Furthermore, the c-Connect box makes it possible to monitor all data that can be recorded by sensors. For example, the c-Connect box can check and measure temperature, humidity or the status of a machine's indicator light. If a value is above or below a defined range, a push notification will immediately be sent to the operator or person responsible via text message, tweet or e-mail. The same goes for malfunctions. As soon as a machine's indicator light turns red, for instance, a notification is issued immediately and the error can be rectified. This makes it possible to prevent long downtimes during unattended operation, such as overnight. ■

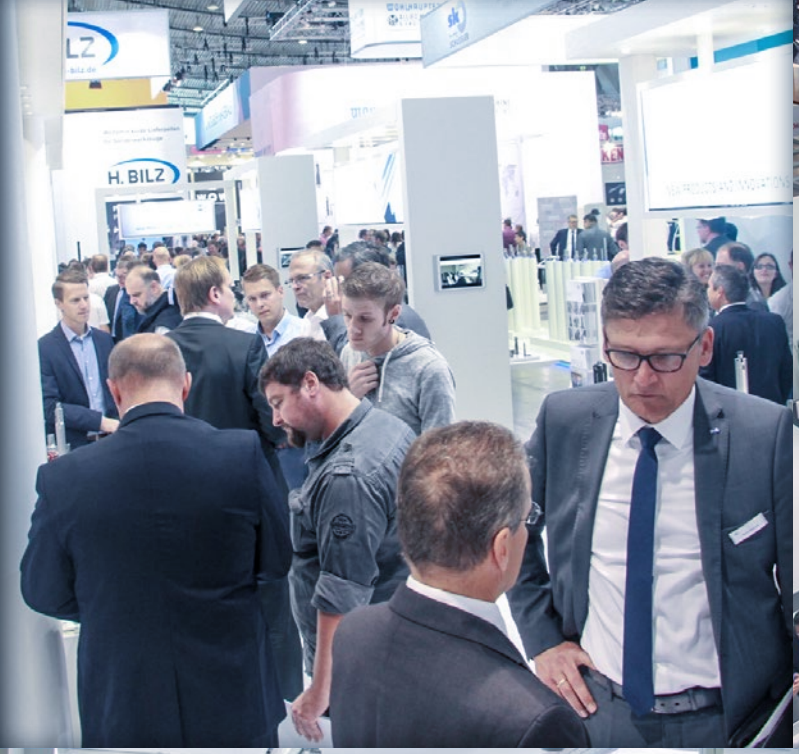
AMB 2018 in Stuttgart

HEALTHY INTEREST IN INNOVATION

AMB alternates with EMO as the most important trade fair of the year for MAPAL in Europe. MAPAL spent five days in Stuttgart at the end of September 2018 with its 440 m^2 stand at the exhibition. According to the organisers, the 2018 iteration of AMB was the biggest and most successful of all time, with 1,553 exhibitors welcoming more than 91,000 visitors.

"We had a lot of high-calibre decision-makers coming to talk to us at this year's AMB – even more than last time," confirms Dr Jochen Kress, President of the MAPAL Group. "The number of visitors, the kinds of conversations we were having with people, the networking – all of it far surpassed our expectations," reports Andreas Enzenbach, Vice President Marketing and Product Management.

Many of the conversations that the numerous members of the field sales force at the MAPAL stand had with visitors revolved around complete solutions for projects. Electric mobility was another key issue. MAPAL was the only precision tools manufacturer in Stuttgart to present advanced machining solutions for the parts necessary for electric mobility. "Just as with connectivity and automation, this is a trend that is going to continue developing and will play a major role at the next AMB in 2020," predicts Dr Jochen Kress. The second major theme of MAPAL's presentation at the trade fair was digitalisation. After all, intelligent and interconnected solutions offer enormous potential for improving productivity. ■


H. BILZ

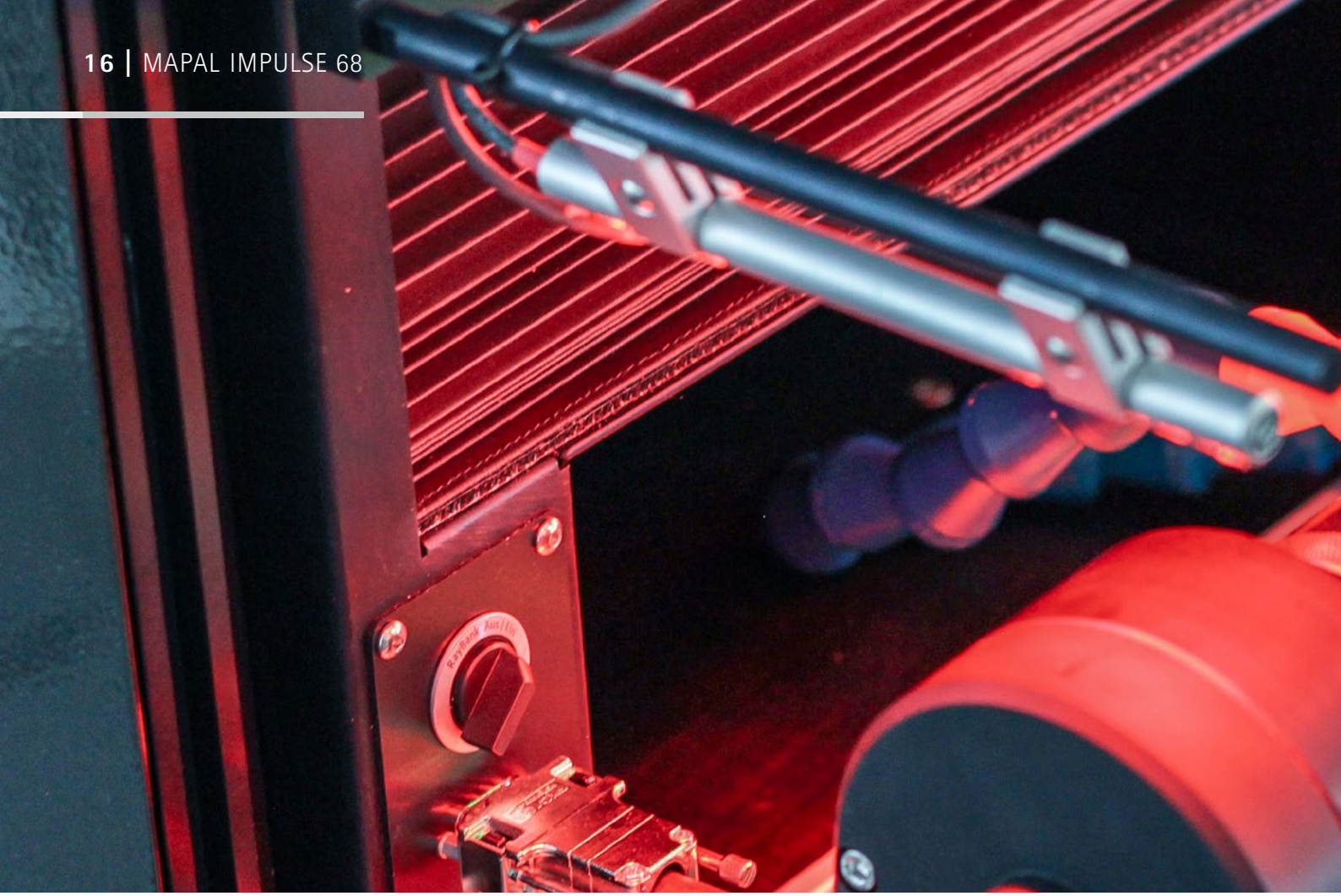
MAPAL
MAPAL
Wenn zwischen Ihnen und uns mehr entsteht.
Das ist der MAPAL Effekt.

MAPAL
NEW

BECK
MAPAL GROUP
MILLER
MAPAL GROUP
WTE
WTE
VEREINT. KOMPETENT. ZERSPANEN.
Ingersoll
Cutting Tools
Ingersoll
Ingersoll
NEW

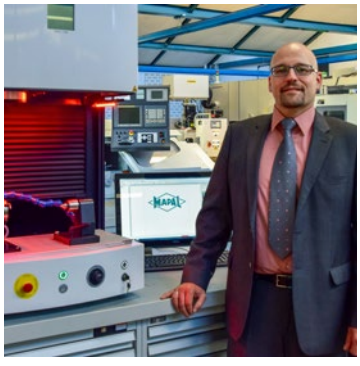
c·Com

MAPAL
AEROSPACE

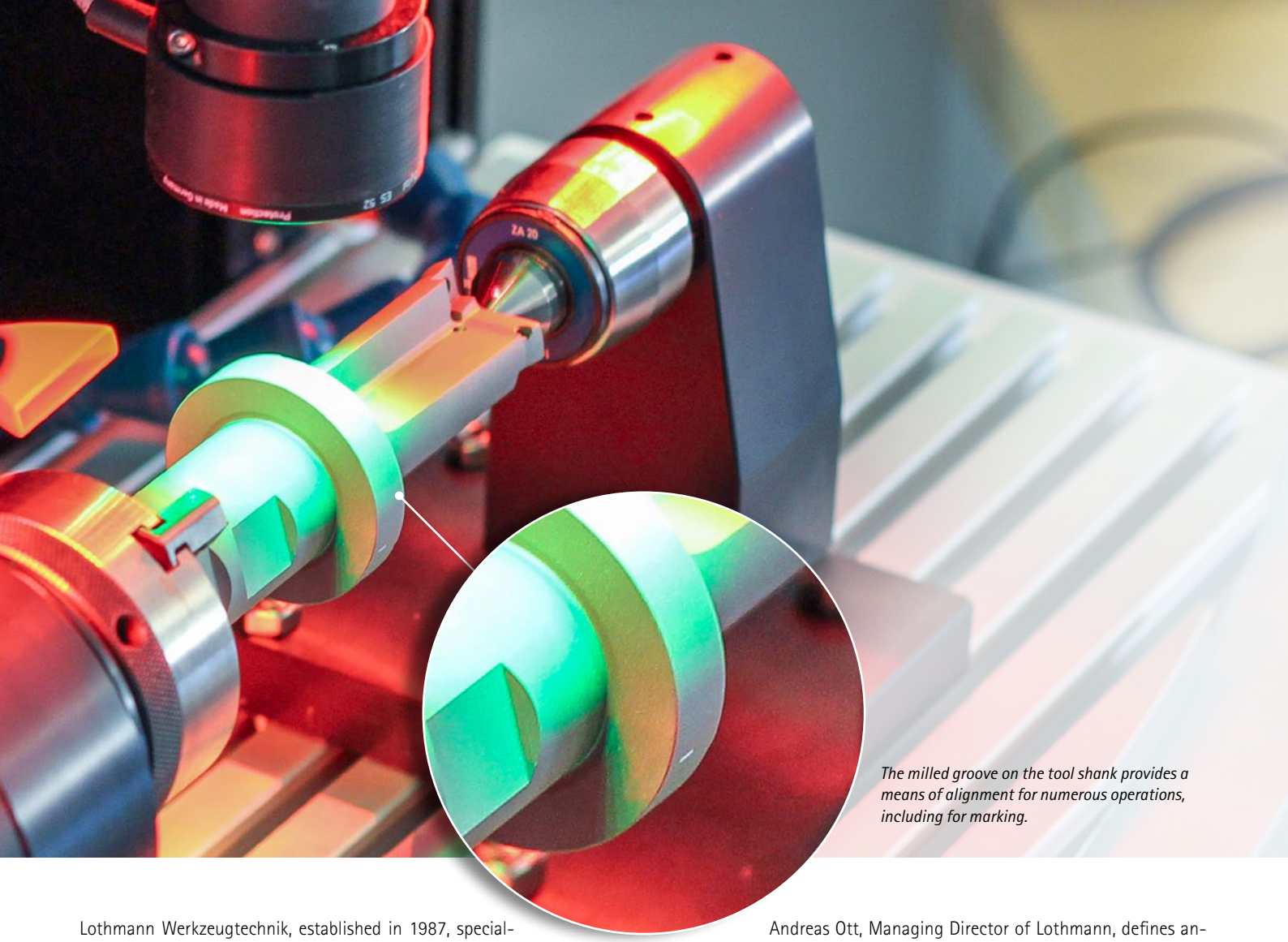


SUPREME FLEXIBILITY AND MARKING QUALITY

Lothmann supplies custom tools with ISO indexable inserts, and does so at unbeatable speed. In addition to highly accurate manufacturing, a Lothmann custom tool also features customised marking in line with the latest standards. To handle this particular process, Lothmann has recently switched to laser marking, using the LASERPLUSS RayDesk XL laser marker.



Andreas Ott, Managing Director of Lothmann, is thoroughly satisfied with the LASERPLUSS system based on the RayDesk XL laser marker.



The milled groove on the tool shank provides a means of alignment for numerous operations, including for marking.

Lothmann Werkzeugtechnik, established in 1987, specialises in manufacturing customer-specific tools with ISO indexable inserts for combined drilling, countersinking, chamfering, skimming and reverse countersinking. Lothmann delivers its tools to customers at an unmatched speed. The company, based in Ludwigsburg in Germany, manages to achieve such incredibly short lead times thanks to almost complete vertical integration. In addition, the manufacturing units are digitally networked and standardised using in-house database-linked software. Lothmann has been part of the MAPAL Group since November 2017.

Joining MAPAL, an international company with more than 5,500 employees, has meant changes to marking requirements for Lothmann as well. For example, the company now needs to add the logo and additional technical information to each tool. These are things that Lothmann could not do with its previous marking system.

CHALLENGING REQUIREMENTS FOR THE MARKING SYSTEM

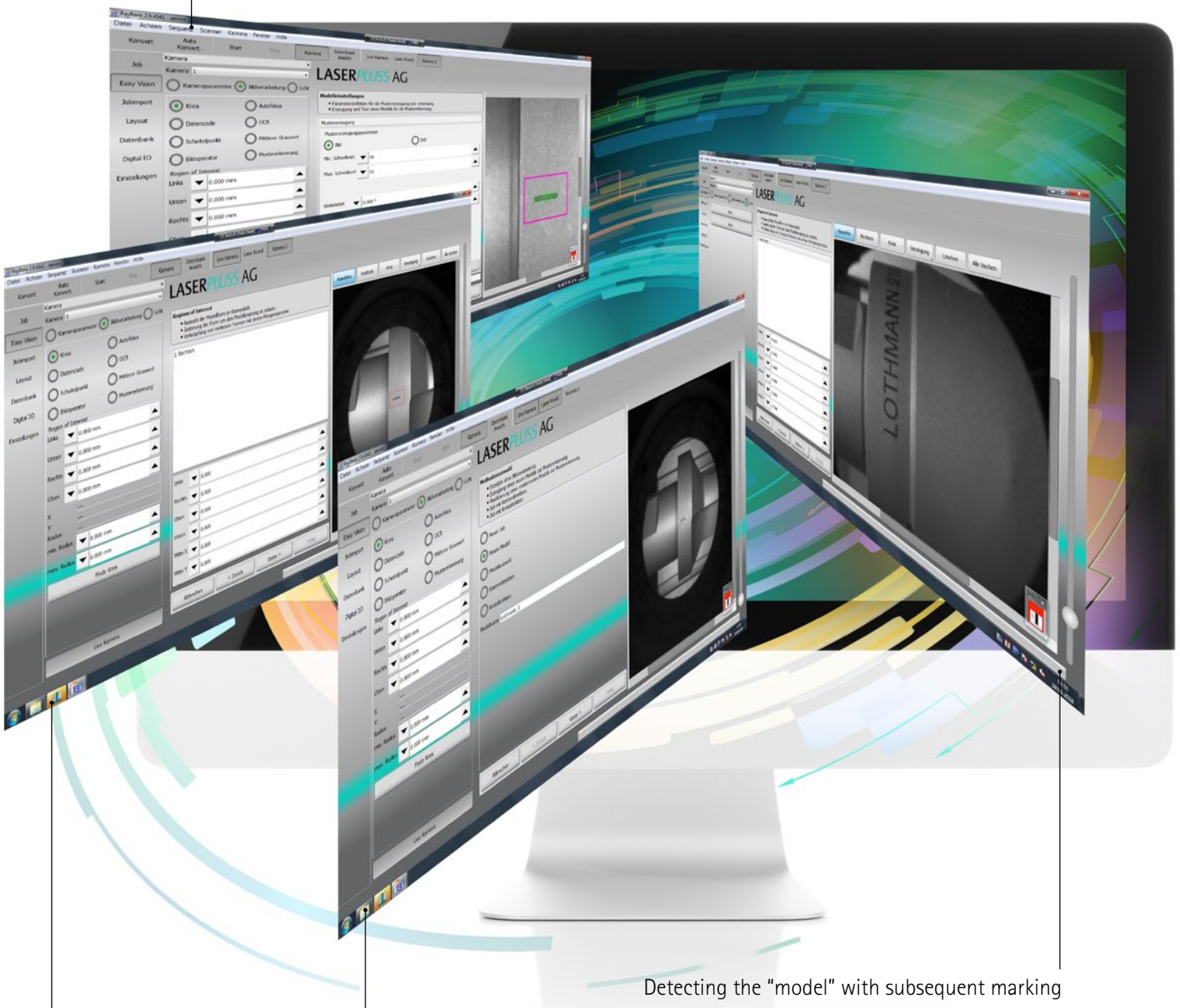
When they were looking for the best possible solution, the specialists at Lothmann had the following requirements: The tools, which can be designed with cylindrical shanks as well as with HSK connection, were to be marked with customer-specific data including information in the form of both text and pictures or, alternatively, data matrix codes. They were looking for two options; either annealing marking (involving an oxide layer applied by means of localised material heating) or engraving to a depth of 0.1 mm. Lothmann also manufactures its tools with HSK connections with projection lengths of up to 250 mm. These need additional stabilisation during the marking process.

Andreas Ott, Managing Director of Lothmann, defines another requirement as follows: "We were looking for a marking system that is able to automatically extract the relevant marking data from our database so as to minimise potential for mistakes." The system also needed to be capable of independently finding the starting point for the marking process, which is indicated by a milled groove on the shank. This way, the time-consuming alignment of the tools is no longer necessary. "The marking's position and text are entered once in our database. After that has been done, there shouldn't be any need for anyone to input this information a second time anywhere else," explains Ott.

LASER MARKING FROM LASERPLUSS YIELDS IMPRESSIVE RESULTS

Lothmann evaluated designs from several manufacturers, but it was the one from LASERPLUSS that really impressed the experts. LASERPLUSS AG has been operating for more than 20 years as a specialist in industrial laser machining systems for various applications, with particular expertise in tool marking.

The equipment designed for Lothmann is based on the LASERPLUSS RayDesk XL laser marker. This system, which features a diode-pumped fibre laser, was designed specifically for marking and precision engraving and can be operated as a stand-alone solution or integrated into a production line. It is a modular system, and it is possible to add rotary axes or the EasyVision camera system for inspecting parts accurately down to the micrometre. The system can be incorporated into any IT infrastructure with the database interface of the integrated RayBank order management


Generating and saving a "model"
LASERPLUSS AG
LOTHMANN
Detecting the "model" with subsequent marking
Detecting the "milled groove" via "EasyView"
Defining a "region of interest"

application. The standard system comes equipped with a red pilot laser for preview purposes and to enable simple, fast setup. It is operated using a touchscreen PC.

Because the RayDesk XL laser marker comes with an extensive range of equipment and options for add-ons, only two customer-specific adjustments were needed in addition to linking it to the Lothmann database. One was to integrate a centre point to keep longer tools stable in the laser marker, and the other was to add the EasyVision camera system to the RayBank software module. This made it possible to detect the milled grooves and align the laser accordingly.

IDENTICAL FEATURE FOR PERFECT POSITIONING

"The milled groove on the shank provides a means of alignment for a whole host of operations in tool manufacturing," explains Andreas Ott. All machining steps make use of this one feature, which enables the lettering to already be positioned during the design phase and the character size to be defined to fit the space available.

The actual marking process begins when an employee manually clamps the tool. The employee scans the barcode on the tool's process card, and the defined marking is loaded to the system. The employee can then use the software to align the laser with the milled groove in just a few steps. The milled groove is saved to the database as a specified feature. The laser then starts the marking process at a defined angle – either an annealing marking or an engraving. This decision is also made during the design phase depending on the requirements of the respective order. For example, annealing marking is used if markings are required on surfaces that absolutely must not be damaged.

SUCCESSFUL USE IN DAY-TO-DAY BUSINESS

Lothmann has been using the laser system to mark its custom tools to great effect since mid-2018. "We can now mark all tools quickly, easily and reliably," says Andreas Ott. "The laser gives us much more flexibility in meeting customer requests for specific markings." ■

Lothmann manufactures customer-specific tools in record time. The LASERPLUSS system allows custom markings to be applied quickly, easily and reliably.

Yet more expertise in tool and mould making:

VOHA-TOSEC IS NOW PART OF THE MAPAL GROUP

voha-tosec, based in Lindlar, Germany, joined the MAPAL Group in September 2018. Its expertise is strengthening the Group in its market position in tool and mould making. Carsten Klein (56) and Dieter Scheurer (58), the Managing Directors and founders of voha-tosec, are thereby laying the groundwork for the company, which currently employs 27 people, to maintain its successful course and continue to enjoy healthy growth.

The collaboration has come at just the right time for both MAPAL and voha-tosec. After all, the tool and mould making industry is a growth market. That is why MAPAL and the company from Lindlar are pooling their strengths. Dr Jochen Kress mentions voha-tosec's wealth of knowledge and experience in tool and mould making "that will help MAPAL to build on its efforts in this field." For Carsten Klein, Managing Director of voha-tosec, the opportunities for growth now open to the company represent the main attraction. "We are thrilled to be part of the international MAPAL Group. MAPAL's global nature and worldwide sales network offer the ideal conditions for us to continue to develop." voha-tosec specialises in milling tools and related services in the high-performance sector. For example, its product range includes solid carbide milling cutters with diameters starting at 0.05 mm as well as complex indexable insert tools. It also offers strategies for process optimisation alongside reconditioning for solid carbide tools. voha-tosec serves a number of industries. It has customers in tool-, mould-, model- and die-making as well as mechanical, medical and dental engineering. The company also counts suppliers to the aerospace and plastics industries among its clients.

"Two of our key strengths are that we are set up to be extremely flexible and that we are constantly investing in the very best production and measurement technology," explains Klein. The company works closely with machine tool manufacturers. Many standard tools have originated from the development of customer-specific products. voha-tosec has enjoyed success on an international scale with these. "We have extremely high standards for our product quality, and we stand out from the crowd when it comes to service as well," says Klein. If a customer has a problem, "we do everything we can to provide it with a solution that same day."

The two founders and managing directors, Carsten Klein and Dieter Scheurer, intend to stick to this strategy. Becoming part of the MAPAL Group has given the company a little more clout. The newest addition to the MAPAL family is rapidly building up its capacity in terms of both personnel and production equipment. ■

PROFILE

nvoha-tosec *is based in Lindlar, near Cologne in Germany, and currently employs 27 people. The company was created in 2004 as the result of a merger of two companies: voha Vollhartmetallwerkzeuge and Tosec (Tools, Service & Consulting).*

Carsten Klein *is in charge of global sales, marketing and procurement at voha-tosec. Klein received business and technical training at former tool manufacturer Moritz Strasmann. He occupied a number of roles there, eventually becoming key account manager. In 1994, Klein decided to strike out on his own and established a new company, Tosec.*

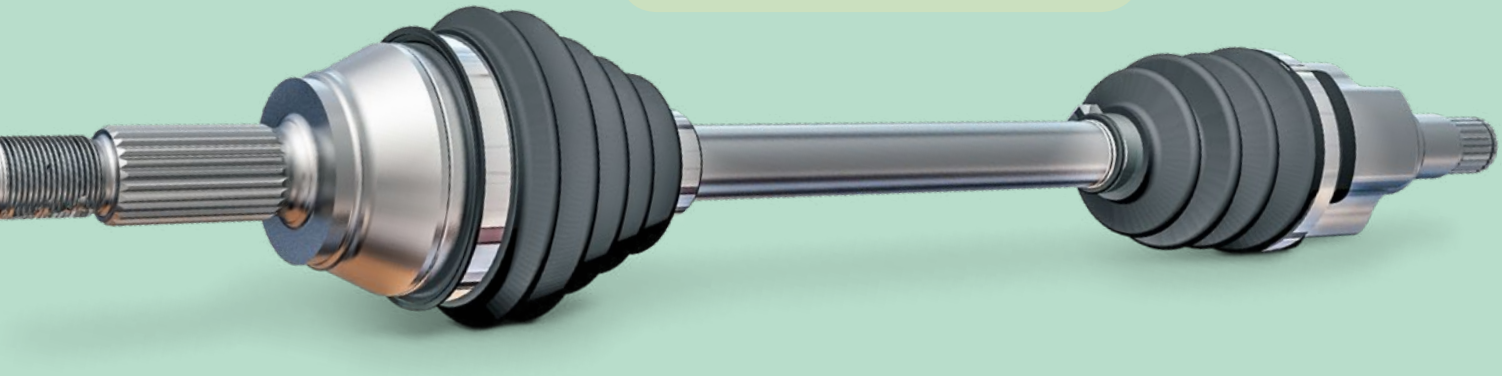
Dieter Scheurer *is responsible for the commercial direction of voha-tosec, as well as its financial affairs and taking care of customers in Germany and among the key accounts. Scheurer began his professional career at Klöckner Humboldt Deutz, a former manufacturer of diesel engines, industrial equipment and machinery. In 1992, eager to take on a new challenge, he joined voha Vollhartmetallwerkzeuge (established in 1988) as a director and took over the operational management of the company.*

CONSTANT VELOCITY JOINTS
for electro mobility

Neapco, an internationally operating supplier to the automotive industry, is receiving an increasing number of enquiries about components for electric vehicles. A current project – a drive shaft that Neapco manufactures – is also used in such vehicles. The company, which is located in Düren, relies on ball nose milling cutters from MAPAL for hard machining the outer race of the constant velocity joint of the drive shaft.

Roughly 750 employees work for automotive supplier Neapco in Düren. (Image: Neapco)

At the Düren location, Neapco has specialised in the production of drive shafts. (Image: Neapco)



"The trend towards electro mobility is becoming visible at Neapco, too," says Ahmet Simsek, who is in charge of tool management at the Neapco location in Düren. The company location, which specialises mainly in the production of drive shafts, has already received a number of enquiries regarding components for electric vehicles. This is hardly surprising, given that Neapco supplies many renowned automotive manufacturers with drive shafts from the plant in Düren and has positioned itself optimally for this task. "We were recently certified according to IATF standard 16949 (quality management in the automotive industry), as a high level of flexibility, efficiency and quality is required in such a highly competitive environment." Simsek is pleased: "We are not just fulfilling customer expectations, we are exceeding them."

Neapco and MAPAL started working together long before Industry 4.0 and connected systems became part of the production shops. "It must have been at the end of the 1980s when we started working on our first joint projects," Ahmet Simsek and Klaus Schwamborn, Area Sales Manager at MAPAL, try to reconstruct their history of collaboration. "We have also been working together successfully in the area of ball nose milling of constant velocity joints (CV joints) for a few years now," says Ahmet Simsek. This is why the precision tool manufacturer was the first choice when it came to the hard machining of the CV joints in the current project, a drive shaft for an electric vehicle. "Due to our many years of experience with MAPAL, they were our first choice," says Ahmet Simsek. ➔

CONTACT ANGLE WITHIN ± 5°

The production of the drive shaft started successfully at the beginning of 2018, and the production volume will be as high as 35,000 units in 2019. "We use the ball nose milling cutters from MAPAL to machine the ball raceways of what is known as the bell or axle spindle, for which strict tolerances are specified," says Ahmet Simsek. It is important that this drive shaft joint transmits the torque with as little influence on the steering as possible, even in the case of large working angles on the drive gears of front-wheel drive vehicles. This is why all requirements regarding quality, dimensions and surface qualities must be observed in a process-consistent manner. For example, the contact angle must be within a tolerance of ± 5°.

The machining of the forged axle spindles on a machining centre of model EMAG VSC 250 Twin makes high demands on the machine as well as the machining technology. The C50 mod. material exhibits a hardness between 58 and 63 HRC after induction hardening. "Our ball nose milling cutters are used for the final hard machining of the raceways," explains Klaus Schwamborn, who has been working with Neapco for many years. The tool, which has four soldered-in PcBN blades, removes between 0.2 and 0.4 mm of material.

The raceways of the forged axle spindles are hard milled on the twin-spindle machining centre EMAG VSC 250 Twin.

Neapco relies on ball nose milling cutters from MAPAL for the hard machining of the ball raceways of the axle shafts.

The MAPAL experts tailored the tool geometry to fit Neapco's application and requirements exactly.

Neapco has its own tool management, including a wear analysis of the individual tools.

MAPAL'S OWN HIGH-PRECISION CONNECTION

The tool is connected to the tool holder via MAPAL's own HFS connection (Head Fitting System). The milling cutterhead is pulled into the holder with a high-strength clamping screw. The cutterhead is aligned via the short taper such that it is accurate to the micrometre and clamped against the face surface to ensure that the length dimensions in relation to the HSK face surface are observed. This highly stable connection also enables a high feed rate.

"The biggest challenge when designing the tool was to observe the tolerances in terms of a symmetrical contact angle and surface quality," Schwamborn recollects. In the interest of cost-effective production, Neapco also places

value on a long tool life. "On the basis of the profound knowledge we have gathered over many years, we tailored the tool to exactly fit Neapco's application and requirements," says Schwamborn. The tool geometry was adjusted precisely to the required values in terms of raceway clearance and the osculation of the balls that later lie between the inner and outer races.

OPTIMUM TECHNICAL SUPPORT

Within just a few days, the machining process was completely broken in at the start of 2018, and Neapco's requirements were all met. Process-reliable production was ensured in no time at all. "MAPAL provided optimal technical support and assistance during the start of production," confirms Ahmet Simsek. "Cooperative, open and trusting collaboration with our partners is incredibly important to us, and this is exactly the kind of relationship we have with MAPAL." To maintain this relationship, Klaus Schwamborn as well as application engineers and product specialists from the precision tool manufacturer often visit Neapco at their location in Düren. Neapco has also set up a consignment warehouse with the MAPAL tools.

Working together to design the optimum machining concept (from left to right): Tool Manager Ahmet Simsek, Machine Operator Yilmaz Aydin, Tool Expert Armin Joussen (all Neapco) and MAPAL Area Sales Manager Klaus Schwamborn.

Extremely high demands in terms of quality, dimensions and surface qualities must be fulfilled in a process-consistent manner when manufacturing constant velocity joints.

The ball nose milling cutter with four soldered-in PcBN blades removes between 0.2 and 0.4 mm of material during machining.

So it is not surprising that Neapco uses numerous other MAPAL tools for its manufacturing – mainly fine boring tools as well as drills and milling cutters made of solid carbide. "We also use the regrinding service and send our tools to the precision tool manufacturer for reconditioning," Ahmet Simsek concludes. ■

INCREASING EFFICIENCY WITH TOOL MANAGEMENT

Professional tool management can bring about respectable levels of success, as a current project in India shows. In its new plant in Anekal Bengaluru, Shakti Precision Components relies on the services of the MAPAL India team and is recording significant increases in efficiency.

The attendants at the opening ceremony were very interested to hear about the tool management services from MAPAL.

Shakti Precision Components (Shakti) is based in the city of Bangalore and specialises in the processing of precision components for various fields of industry. With more than 25 years of experience, Shakti is one of India's leading providers with an extensive customer portfolio. To satisfy the increasing demand, it was decided to invest in a completely new plant. The greenfield project near Anekal Bengaluru, 35 kilometres south of Bangalore, today spans an area of 1,300 square metres. An office building and a state-of-the-art production facility have been built. The production area provides space for more than 250 CNC machining centres and other machines. 90 of the 100 employees work in production.

Shakti Precisions Components commissioned MAPAL India with the tool management for the plant. The project scope intended for MAPAL to set up and operate a setting room. The main objective was to eliminate production stops caused by tools that are missing or set incorrectly. A further aim was to increase production quality and delivery reliability with MAPAL as the tool manager. "Further requirements specified by Shakti included optimising inventory management, improving the procurement of tools and other production equipment, and preparing reports and analyses on tool wear," reports Thanigaraj Sripathy, Managing Director of MAPAL India.

RELIABILITY AND EFFICIENCY

MAPAL India and Shakti worked closely together on the project right from the start. All the equipment of the setting room on site was delivered by MAPAL. "It is a great advantage for us that the MAPAL Group offers its own tool dispensing systems, setting devices and other equipment for the setting room. This way we did not have to use external companies for the setting room and could rely on our own products", stresses Sripathy. In order to be able to optimally design the production and logistics processes for the customer, the tool management was decidedly tailored to the needs and circumstances of Shakti during the planning phase. The installed system allows process parameters such as tool life and cutting data to be managed centrally and called up in a decentralised manner by individual departments. For example, the manufacturing and planning departments of Shakti can access important details with a single click. The technology transfer is also made easier, and the exchange can be performed within a specific production facility or across multiple locations. This connected approach allowed Shakti Precision Components to improve its productivity considerably and to significantly increase machine capacity utilisation. The persons responsible at Shakti intend to use this resulting free capacity to become the preferred supplier of their most important customers.

The commissioning of the new plant was celebrated with a big ceremony in May 2018. Representatives from key customer Husko International (USA), MAPAL India and MAPAL Germany as well as numerous business partners and customers attended the event. Bob Mortensen, President of Husko International, officially inaugurated the Husco cell of the manufacturing unit. During the opening event, the MAPAL team presented the tool management services in general and those used at Shakti Precision

MAPAL INDIA

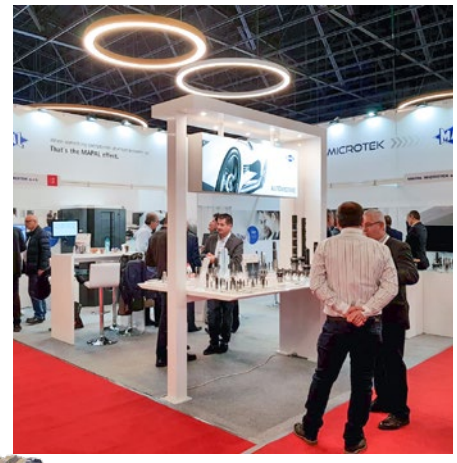
MAPAL has been active in India since opening a branch there in 1999 and now has more than 150 employees. In addition to administration and customer service, the head office in Coimbatore includes a modern manufacturing facility that is geared to quickly supplying the Indian market with individual special tools. Repairs and reconditioning are also performed here. In addition, MAPAL operates sales and service offices in New Delhi, Pune, Chennai and Bangalore.

Components specifically. All the attendants at the event were very interested to hear about the improvements that have been achieved in terms of productivity and efficiency.

C.R.N. Murthy, Managing Director of Shakti Precision Components, appreciates the first rate service MAPAL provides during the project start-up phase and in ongoing operation: "We are delighted with our great cooperation with MAPAL and the increases in productivity we have been able to achieve thanks to our customised tool management. The provision of tools that can be used on the machine directly, thereby omitting the setting effort at the machine, is an extremely valuable optimisation of the production process for us." Thanks to MAPAL, Murthy adds, there is now also transparent inventory management, which helps to avoid duplicates and order planning with foresight. All this adds up to a highly comprehensive system that is in use every day. The system, that leaves room for further improvements and new functions, will allow both companies to further develop their cooperation. For example, all CNC machines from Shakti are to be equipped for reading and storing the tool details on tools that are fitted with a chip in the future. With this feature, MAPAL can also monitor the current tool life and therefore draw conclusions as to the total service life and remaining tool life. ■

NEW LOCATION IN ROMANIA

Headquarters of MAPAL Microtek S.R.L. is in Braşov



MAPAL is expanding its capacities in Romania and has acquired a majority stake in Microtek in Braşov. Microtek is a manufacturer of custom tools and specialized in the regrinding of carbide and HSS tools. With the integration of the company into the MAPAL Group, Braşov becomes the base of the new subsidiary MAPAL Microtek S.R.L. The MAPAL branch in Bucharest was closed. Valentin Andrei, formerly CEO of Microtek, manages the business of MAPAL Microtek. The technical manager is Alin Nitu. „With the realignment, we are strengthening our position in the Romanian market and expanding our presence and our service capacities," says a pleased Dr Jochen Kress, President of MAPAL. MAPAL Microtek will use the new opportunities to ensure short service times especially of repair and regrinding orders. The existing machinery in Braşov will be expanded and additional jobs will be created. MAPAL currently employs around 60 people in Romania.

With the realignment, MAPAL meets the increasing demands of customers. The economy in Romania has been growing for years. International car manufacturers and their suppliers are expanding their plants in the EU member state or are setting up new locations. This development is accompanied by a growing demand for high-performance precision tools and their rapid reconditioning. ■

MANAGING DIRECTOR | MAPAL MICROTEK

Valentin Andrei has been Managing Director and co-owner of Microtek since 2007. The mechanical engineer started his career at the Romanian vehicle and automobile manufacturer FAUR. He then took on various management positions in the automotive supply industry, in the energy sector and in the engineering sector. Andrei has been in the precision tooling industry for 21 years.

2019 SUPPLEMENTARY VOLUME

on the MAPAL catalogue range

A second supplementary volume has now been added to MAPAL's range of catalogues. The 2019 issue joins the 2018 supplementary volume and completes the current range. In the supplementary volume, readers will once again find plenty of new products and additions. For example, the 280-page catalogue features a wealth of new solid carbide drills and milling cutters. These include the milling tools with radial ISO indexable inserts, a highlight of MAPAL's international trade show presentations last year. The new UNIBASE-S tool dispensing system – the "Spotlight" in this issue of IMPULSE – is also part of the 2019 supplementary volume.

Like the eight-part full catalogue, the second supplementary volume also boasts a clear and user-friendly layout. Using the main tabs, product categories can be quickly and easily accessed, such as tools for drilling from solid, boring and turning, milling and clamping or equipment for setting, measuring and dispensing.

The print edition of the supplementary volume can be requested via the MAPAL website at **www.mapal.com/en/catalogue-order**. Alternatively, you can view or download the digital version of the supplementary volume on the MAPAL website. ■

PROBLEM-SOLVER TURNS OUT TO BE A **BIG HIT**

FIVE SIZES OF INDEXABLE INSERTS

Operations involving drilling from the solid in aluminium often present a challenge. Brazed PCD tools, actually intended for this group of materials, often provide only limited cost-effectiveness due to the high rate of wear during drilling. A drilling tool with CVD-diamond-coated indexable inserts, however, delivers impressive results in every regard. The tool was originally designed as a problem-solver, but is now unrivalled when it comes to performance and cost-effectiveness.

"Operations involving drilling from the solid were often the main obstacle in the design of complete processes for aluminium parts", recalls Dr Wolfgang Baumann, Product Manager for tools with ISO elements at MAPAL. "Brazed PCD tools, which are the equipment of choice for large-scale production of aluminium parts, suffered problems with tool life in many cases, which was not satisfactory from a cost-effectiveness perspective." The problem with this operation lies in the fact that PCD, the very hard, brittle cutting material, cannot cope with a cutting speed of zero in the centre of the bore and will break as a result. There is another challenge in that when aluminium is used in drilling from the solid, it is in constant contact with the tool, which presents the risk of a built-up edge forming. In addition to the short tool life, there was the problem that reconditioning brazed PCD cutting edges is an expensive process. "Using a tool with indexable inserts was the logical alternative in terms of cost-effectiveness,", says Dr Baumann, adding, "For machining a suspension arm, we proactively developed a drilling tool with CVD-diamond-coated indexable inserts that also incorporated step and chamfer machining. The tool worked very well from the outset, far surpassing all expectations."

THE IDEAL SOLUTION FOR DRILLING COMBINATIONS

For drilling from the solid, the innovative tool features two CVD-diamond-coated ISO indexable inserts that position themselves across the cutting width and start the cut eccentrically. "Using carbide as a cutting material for machining aluminium materials would deliver only short tool lives. CVD-diamond-coating, however, offers guaranteed tool life, and is the ideal solution in respect of the potential formation of built-up edges", says Dr Baumann. That is because the coating's extreme hardness makes it highly wear-resistant. Diamond has a very low affinity for non-ferrous metals, which largely prevents material adhesion and thus the formation of built-up edges. In addition, its good thermal conductivity ensures that residual heat dissipates quickly and allows very high machining speeds.

The indexable insert has three cutting edges, which makes it exceptionally cost-effective. Not only that, but the tried-and-tested W shape, offering excellent positional accuracy, has also been chosen for operations involving drilling from the solid. Finally, just one type of insert can be used to occupy both cutting positions, which is of significant benefit to customers when it comes to handling and storage costs.

THIRTY THOUSAND BORES PER INDEXABLE INSERT

The machining outcomes speak for themselves. The cutting speeds of a PCD tool, the feeds of a double-edged drilling tool and ample tool lives are all enough to win users over completely. For example, a combination tool for drilling from the solid and chamfering is used to machine a suspension arm made of AlSi1 at a diameter of 41.6 mm. The cutting speed ranges between 800 and 1,000 m/min, while the feed is 0.3 to 0.45 mm per revolution. The tool life for the drilling stage is 10,000 bores per cutting edge, which equates to 650 metres of drilling. That means that the indexable insert does not have to be replaced until 30,000 bores have been completed. In this case, the subsequent finishing stage is performed with a brazed PCD cutting edge, reaching a tool life as high as 90,000 bores.

"Based on the outstanding results achieved in a range of applications, we have set up a full range of indexable inserts for drilling aluminium from the solid," says Dr Baumann. "That means that we cover diameters ranging from 15 to 54.9 mm with five different sizes of indexable inserts available from stock, and we can also provide spiral versions of the tool." ■

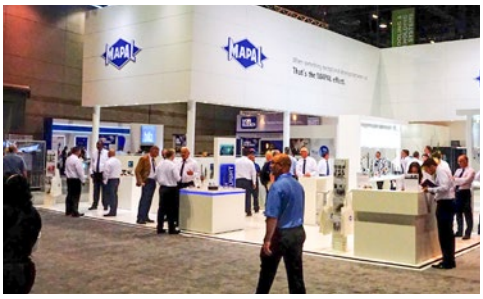
Single- or multi-staged tools with CVD-diamond-coated ISO indexable inserts are exceptionally cost-effective and easy to use.

TRADE FAIR IN CHICAGO SETS NEW RECORDS

IMTS 2018 (the International Manufacturing Technology Show) took place in Chicago, Illinois, USA, in mid-September. The largest trade fair for the manufacturing industry in the USA drew almost 130,000 visitors to the convention centre at McCormick Place and set new all-time records for exhibition space and the number of participating companies.

MAPAL was also there to welcome a host of existing and potential customers to its stand. "Over the six days of the exhibition, we talked to a lot more people than we did at IMTS 2016," reports Sidney Pimenta Paiva. As far as the CEO of MAPAL USA is concerned, that is a clear indication of the robust nature of the economy in North America. The good visitor traffic at the MAPAL stand also reflected the keen interest in new technologies among guests. "IMTS 2018 showed that the US economy is in good shape. That means that there are some outstanding opportunities for MAPAL to expand its business in the USA and to conquer new corners of the market," stresses Paiva. MAPAL showcased the full extent of its products and services at the trade fair. For example, tools for making heat exchangers met with an extremely enthusiastic reception, as did innovative concepts for machining various primary and auxiliary assemblies for electric vehicles. The innovations on show including standard milling tools with radial ISO indexable inserts and the expanded Tritan-Drill series were also popular among visitors to the exhibition.

On the basis of this demand, MAPAL is currently expanding its Fountain Inn location. "In addition to the regrinding of tools, we will also install a production of solid carbide drills there. Moreover, we are intensifying our technical support in the aerospace industry and expanding our area sales activities", announces Paiva. ■



AID FOR EARTHQUAKE VICTIMS IN INDONESIA

MAPAL INDONESIA

has been based in Jakarta since 2014. Eleven employees look after the production facilities of international companies in the island state with the support of the experts at the headquarters in Aalen. The core area of activities is the automotive industry. Other market segments, such as the oil, gas and aviation industries, are being gradually opened up.

This past September, the country of Indonesia in south-east Asia was devastated by a series of earthquakes and a tsunami. The news of the terrible disaster was met with deep sadness among the employees at MAPAL. Immediately after the awful event, staff at the branch in Indonesia and at the MAPAL headquarters in Aalen resolved to take joint action to deliver emergency aid to families affected by the tragedy. Clothing, food and medicine, especially for children and young people, were purchased locally and donated to the aid organisation ACT (Aksi Cepat Tanggap). ■

TATA HONOURS MAPAL INDIA

From left: Satish Borwankar (Chief Operating Officer Tata Motors), Thanigaraj Sripathy (Managing Director MAPAL India), Guenter Butschek (Managing Director Tata Motors), Tom Flack (Chief Procurement Officer Tata Motors)

Tata Motors presented MAPAL with its prestigious "Technology and Innovation Award". Tata Motors, the largest car manufacturer in India, decorates its best suppliers every year. MAPAL received the award in recognition of its outstanding delivery and service record in terms of product quality, technical support, reliability, customer care and cost management. MAPAL's Indian branch in Coimbatore currently supports seven Tata Motors facilities.

MAPAL was the only supplier from the machining industry to be chosen, its status of technology partner elevating it to the highest award category. "The services provided by MAPAL extend far beyond those of a simple supplier," said the panel when explaining their decision.

Thanigaraj Sripathy, Managing Director of MAPAL India, was grateful for this demonstration of Tata's confidence in the company, commenting, "We are delighted to have the opportunity to contribute to the success of Tata Motors through our expertise in development and technology." He said that the MAPAL Group was proud to have been chosen as a partner by a company as distinguished as Tata Motors.

This is a promising development, given the reorientation of the branch only five years ago. In 2014, the headquarters of MAPAL India were relocated from Bangalore to Coimbatore. The new plant meets the high and globally consistent quality standards of MAPAL. ■

TRADE FAIRS IN **2019**

MAPAL will be attending numerous international industry trade fairs. Visitors to these fairs can come to MAPAL's stand to be presented with the latest technology developments and to explore the company's range of innovative products for the machining process. The MAPAL exhibition team will be on hand to give expert advice on all products and services and to showcase the innovations. Business partners, customers, journalists and interested parties are welcome to come and see us. ■

24. - 30. January 2019	**IMTEX**	Bangalore | India
05. - 08. February 2019	**INTEC**	Leipzig | Germany
19. - 22. February 2019	**TURNING DAYS**	Friedrichshafen | Germany
05. - 08. March 2019	**GLOBAL INDUSTRIE**	Lyon | France
12. - 14. March 2019	**JEC World**	Paris | France
26. - 28. March 2019	**SAE Aerotech Americas (Aerospace)**	South Carolina | USA
28. - 30. March 2019	**MECSPE**	Parma | Italy
15. - 20. April 2019	**CIMT**	Peking | China
07. - 10. May 2019	**CONTROL**	Stuttgart | Germany
07. - 11. May 2019	**EXPOMAFE**	São Paulo | Brasilien
14. - 16. May 2019	**EASTEC**	West Springfield, Massachusetts | USA
14. - 17. May 2019	**PRODEX**	Basel | Switzerland
14. - 17. May 2019	**MACH-TECH**	Budapest | Hungary
21. - 24. May 2019	**MOULDING Expo**	Stuttgart | Germany
17. - 23. June 2019	**Paris Air Show**	Paris | France
10. - 12. September 2019	**Composites Europe**	Stuttgart | Germany
16. - 21. September 2019	**EMO**	Hannover | Germany
24. - 26. September 2019	**AEROTECH EUROPE**	Bordeaux | France
22. - 24. September 2019	**WESTEC**	Long Beach | USA
22. - 24. October 2019	**SIANE**	Toulouse | France
22. - 24. October 2019	**SOUTH-TEC**	Greenville | USA
22. - 24. October 2019	**Wichita Trade show (Aerospace)**	Wichita | USA
23. - 26. October 2019	**MECT**	Nagoya | Japan
20. - 21. November 2019	**Quest Industries**	Rennes | France
05. - 10. November 2019	**CIIE – China Int. Import Expo**	Shanghai | China

Approaching the future with plenty of motivation:

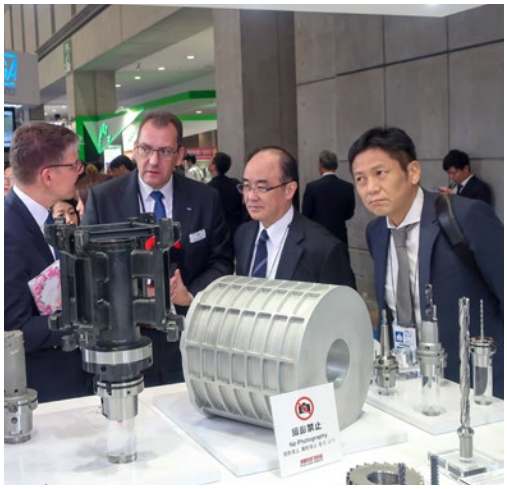
BIG IN JAPAN

Koichi Matsuda, Managing Director MAPAL KK

In November, MAPAL KK attended JIMTOF (Japan International Machine Tool Fair), its first major trade fair under the new management. Koichi Matsuda had taken over as the head of the Japanese subsidiary at the start of 2018. He is very happy with how the trade fair went, commenting: "There was a great deal of interest from visitors in our machining solutions." Over the course of the six-day event in Tokyo, MAPAL presented complete solutions for machining various parts, such as components for electric mobility. The subject of minimum quantity lubrication was addressed not only at the company's stand, but also at a specialist seminar.

Alongside Dr Jochen Kress, President of the MAPAL Group, and Armin Kasper, MAPAL's Director Asia-Pacific, Matsuda talked to industry media about the future direction of the subsidiary. All key trade journalists in the country came to the company's press conference. "Into the future with the new CEO" is the theme for MAPAL's plan for Japan, which includes significantly expanding sales and local customer service. There is also going to be a department at the company's site dedicated to the aerospace industry.

"We intend to grow in Japan," explains Kress. Consequently, the company is investing. As Kress announces, "We are going to build a new factory." To make sure that the personnel are in place to suit these plans, new sales staff have been recruited in Japan and were there to meet customers at the exhibition. "We will be recruiting more specialists," says Matsuda, who is glad to have such a highly motivated team growing around him. ■



70,000 visitors a day –

INAUGURAL CIIE A RESOUNDING SUCCESS

At the beginning of November 2018, the China International Import Expo, or CIIE, was held for the first time. It was opened by Chinese President Xi Jinping. "A trade fair full of superlatives" is how Andreas Enzenbach, Vice President Marketing and Product Management at MAPAL, describes it. And how right he is. Every day, the roughly 3,600 exhibitors from 172 countries welcomed more than 70,000 visitors to the National Exhibition and Convention Center in Shanghai.

MAPAL's appearance at the trade fair focused on the aerospace industry. In keeping with that theme, a six-metre wing stood proudly in the centre of the stand, not only catching the attention of passers-by but also serving as a demonstration of a real product machined with the precision tool manufacturer's milling cutters. "The Chinese aviation industry is growing by leaps and bounds, and demand for aircraft in China is on the rise," comments Andy Liu, Managing Director of MAPAL China. "We are planning to offer our customers in this industry a wider range of complete solutions for reliable and cost-effective machining."

Staying true to this main focus, Dr Jochen Kress, President of the MAPAL Group, gave a talk at the IASC (International Aviation Supply Chain) forum, where he outlined the precision tool manufacturer's products and services. At the forum, Armin Kasper, Director Asia-Pacific, and other companies signed a contract with the China International Import and Export Bureau to assure the company's participation in the second CIIE. The trade fair is due to become a regular annual fixture in China. ■

PARTICULARS

PASSING THE BATON AT RAINEY IN NORTHERN IRELAND

ROY DOUGLAS | EAMONN ORCHIN

Roy Douglas, former managing director of the MAPAL subsidiary Rainey Engineering Solutions in Lisburn, Northern Ireland, retired at the end of the year. He has been succeeded by Eamonn Orchin.

Roy Douglas has worked at Rainey Engineering Solutions for 30 years. Under his leadership, the company, established in 1928, became the leading tool supplier in Northern Ireland. The sales engineer's career began when he joined Rainey in 1988. He became managing director four years later. Douglas rapidly secured new customer bases in the automotive sector and in the oil and gas industry. A regrinding service for tools that he set up at Rainey in 1992 was also very successful, filling a niche in the market in Northern Ireland in the process. MAPAL precision tools were added to the product range in 1997. Douglas and a partner subsequently took ownership of Rainey. In 2015, the company became part of the MAPAL Group.

Last year, Douglas handed operational management of Rainey over to Eamonn Orchin, with whom he had maintained a business relationship over many years. Eamonn Orchin had previously worked as a production manager at car manufacturer Ford. In 2005, he moved to construction machinery manufacturer Terex, where he was in charge of global production management. He joined Rainey in 2017, taking over a range of management functions. On 1 November 2018, Orchin took over from Douglas as managing director.

Rainey offers the full MAPAL product range of precision tools, clamping systems and adapters. The MAPAL subsidiary works closely with the MAPAL branch in Rugby, England. Wayne Whitehouse, Managing Director of MAPAL Ltd in Rugby supports Rainey in his capacity as chairman, now alongside new Managing Director Eamonn Orchin.

MAPAL SPOTLIGHT

1 | Easy to use via touchscreen interface

2 | Storage drum can be rotated easily by hand

3 | Only registered employees can remove items

4 | LEDs help employees find their items quickly

5 | Localised storage directly on the workbench

UNIBASE-S – saving time thanks to shorter distances in manufacturing

As a means of enabling frequently used supplies in manufacturing to be stored and managed locally and without taking up too much space, MAPAL has developed the new UNIBASE-S tool dispensing system.

Its compact dimensions allow the stock-controlled UNIBASE-S tool dispensing system to be set up directly on the workbench. The standard version features 96 storage compartments, which can be used to store supplies such as indexable inserts, tools, chucks and personal protective equipment. That saves employees having to make the trip to the central storage area and means that they can instead find what they need right there in the manufacturing area.

KEY FACTS:

- Entry-level stock-controlled, local dispensing system
- Items available in the manufacturing area
- Less effort required for logistics
- Fast item search thanks to compartment identification with LED lighting
- Monitored item removal
- Compact dimensions – perfectly suited to the workbench
- Two sizes available - with 96 or 192 storage compartments
- Pre-installed software

Order No. 10162398 | V1.0.0
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