SUCCESS STORIES
Technology partners and problem solvers: Gühring is more than just a tools supplier. The success stories of our customers speak for themselves.

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E-MOBILITY
The automotive industry in transformation: How Gühring is able to process all machining components of an e-car already.

P.10

RT 100 XF
Features of the new ratio drill, its advantages, and how successfully it is being used by customers.

P.14
120 years of manufacturing expertise, innovative force, synergy: These are the pillars of our success that have allowed Gühring to grow into a full-service provider and market leader. This is crowned by the RT 100 XF: featured here.

Thanks to Gühring’s extraordinary consulting expertise, resourcefulness, and the ability to think outside the box, our clients and users keep achieving incredible success.

You will find a portrait of Gühring – in figures, dates and facts – as well as the outlook for 2020 from CEO Oliver Gühring in the company overview section.

The motto of EMO 2019, the world’s leading metalworking trade fair, was “Smart technologies driving tomorrow’s production!”: The highlights presented by Gühring and the success of the trade fair.

The miniaturisation of a number of industries such as electrotechnology or tool and mould-making requires processes and applications that long seemed inconceivable: Gühring is getting equipped.

More than a manufacturer and full-service provider, Gühring is not just extremely well-versed in the machining questions of tomorrow, but also in the field of digital solutions. What the Gühring Tool Management Software can do.
Dear customers,

The economy, and especially the automotive industry and its suppliers, is currently facing great challenges. And even if these challenges are largely underpinned by politics, the current consolidation comes unexpectedly for all of us after ten good years.

We are positive about future economic development in the medium and long-term. We see growth in the coming years even for the automotive sector, albeit not as rapid as in the past. The other machining sectors such as aviation, mould-making, medical technology, as well as general mechanical engineering are and will remain growth sectors.

However, the time has come to increase productivity and efficiency, and optimise processes. Here, we see great potential in the field of digitisation and innovative tools, examples of which are presented in this magazine. You will also find content on the topic of digitisation in this brochure.

We will continue to produce innovative, powerful tools and provide competent advice to you as our customers with our sales staff – online as well. But also in the future, we do not want to just be a tools supplier, but your full-service partner for machining. We already offer many services today: tool reconditioning, complete planning of components with cycle times and unit costs, tool management, logistical or technological tool management, and most recently, the reading of machine data for tool and process optimisation.

We will only be successful if we make you, our customers, more competitive. Please contact us to schedule an appointment.

We wish you much success.

Oliver Gühring
CEO, Sales and Marketing
MACHINING RECORD

HOW GÜHRING & CHIRON SET THE HPC RECORD TOGETHER

Chiron and Gühring, machine manufacturer and tool specialist. That means common development goals and the same affability. I.e. to deliver outstanding products and increase their recognition efficiency even further through symbiosis. The Swabian champions have been working together for years on collaboration projects. Once both products were ready to be put on the market, the experts joined forces to demonstrate their efficiency.

COMMON DEVELOPMENT GOAL

Extreme material removal rates, pharmaceutical feed rates. Both companies pursue the same goal. i.e. bringing a product to the market that is outstanding in terms of dynamics and performance. The companies were in the development phase of their top products – the new FZ 16.5 five axes for Chiron and a version of the HSK 63 milling cutter for Gühring – at the same time and maintained an ongoing exchange due to the many years of collaboration on projects. Once both products were ready to be put on the market, the experts joined forces to demonstrate their efficiency.

The interplay of machine dynamics and milling stability makes such a material removal rate possible and will make the hearts of those in mold-making, the aviation industry and the automotive industry beat faster.

MILLING STRATEGY: HPC ROUGHING

Gühring specialists applied an HPC strategy. Control of the cutter path with low radial infeed enables a comparably gentle edging of the workpiece. HPC roughing is especially suitable for machining greater cutting depths, whereby the end mill processes the workpiece in its entire length with the entire cutting length. This cutting forces are reduced and distributed equally along the entire cutting length. This enables high processing speeds and longer tool life. High-performance cutting is the first choice in applications with massive cutting rates. The components to be processed are usually made of high-strength steels, which place increased demands on the processing. To achieve corresponding results, higher cutting speeds, more feeds per cutting edge, and greater cutting depths are used. The high cutting speeds can be realized with the help of high rotation frequencies, provided that the cutting machine enables this.

The cutting method is not new, but HPC appears as a further development in machining when it comes to massive cutting rates only on the basis of the performance of today’s processing centres such as the FZ 16.5 five axes and geometry adjustments and wear resistances of cutting tools. The top goal was to set a benchmark for this with absolute process reliability.

Here is what Michael Elite, Head of Machine Development of Chiron said about it: “We have clearly increased the input power and the dynamics and cutting capacity of series 16. But it becomes really fun when the tool manufacturer is obliged to deliver an even more powerful tool because the machine can do even more. Then we know we did everything right.”

AT A GLANCE

Single-spindle FZ 16.5 five axes
FZ 16.5 five axes - Chiron, HSK 63
Material: 16MnCr5 1.7131
vf = 14324 mm/min
ap = 63 mm
fz = 0.5 mm/d

Two products, one aspiration: top performance.

The Gühring tool RP 100 Speed P is an end mill especially adapted for processing steel, high-strength steel, and cast iron. Its 45°-angle chamfer with smooth cutting-edge opening ensures a soft, spiral cut and very quiet operation. The optimised city form, i.e. a deep- end flute in the front cutting area, removes chips better during ramping and fed plunging. A stable cutting edge was achieved by means of a tangent protection chamfer and connection of the flute. Chip breakers (shortest cutting length of the cutter ensure a soft cut and very quiet operation. This reduces the machine load and increases volume output. Perfect conditions for Chiron’s single-spindle FZ 16.5 five axes. This processing centre is designed for special requirements as to the accuracy during 5-axis machining – with top dynamics and productivity of the same time. The right tool is essential.

The cutting parameters were thus set: 1,000 cm³ of steel per minute (16MnCr5) in 60 seconds. Eight kilograms of steel per minute. The interplay of machine dynamics and milling stability makes such a material removal rate possible and will make the hearts of those in mold-making, the aviation industry and the automotive industry beat faster.

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Chiron & Gühring: Here is a film about the common development work of the Swabian champions.

Cutting parameters that had never been seen before

In HPC conditions, the entire cutting length is used with a low cutting width (5-15 percent ap). Extremely high feeds can be achieved as a result. The feed per cutting edge was 0.5 mm in the record attempt. That means, 2 mm of feed per rotation for 4 cutting edges. This is of interest for all companies that have to machine great quantities of steel. Machine components, the classic tool and mold-making, where predominantly high-strength steels are found, but also aviation, where lightweight components are generated here with material with machining rates of up to 90 percent. Of course, the special cutting geometry can also be optimally used in the automotive and supplier industry, and is greatly popular due to the large cutting length.

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When processing engine blocks for lorries (GG26Cr), deep hole drills of up to Ø 28 mm are necessary. These drills with large diameters are time-consuming and expensive. The customer’s goal for the project was: to significantly reduce drilling time by up to 50 percent.

Important parameters had to be observed: the machine’s axial force limit of 10 kN had to be observed, with same drilling quality and same tool life. Together with the automotive manufacturer, the tool supplier Gühring developed a 4-fluted gun drill from a carbide of its own design and a 4-fluted pilot drill for perfect guiding of the gun drill. The tool geometry had to be adjusted so that the forces could be kept as low as possible. The design of the gun drill was 2+4-fluted to cope with the relatively large chip volume. In the first step, the two inner cutting edges machine and centre with a strongly elevated machining rate. In the second step, the high feed forces are then distributed among the four outer cutting edges in order to stabilise the tool. The central hole with the Y distribution ensures that all four cutting edges are equally supplied with coolant.

### TOOL PERFORMANCE REPORT

**Comparison of Serial Process – Test Ø 28 mm**

<table>
<thead>
<tr>
<th>Tool</th>
<th>2-fluted gun drill</th>
<th>4-fluted gun drill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation speed</td>
<td>n = 900 1/min</td>
<td>n = 900 1/min</td>
</tr>
<tr>
<td>Feed per cutting edge</td>
<td>f₁ = 0.17 mm/rev</td>
<td>f₁ = 0.15 mm/rev</td>
</tr>
<tr>
<td>Feed</td>
<td>f₂ = 0.34 mm/rev</td>
<td>f₂ = 0.60 mm/rev</td>
</tr>
<tr>
<td>V speed</td>
<td>v₁ = 206 mm/min</td>
<td>v₁ = 540 mm/min</td>
</tr>
<tr>
<td></td>
<td>t₁ = 200.8 s</td>
<td>t₁ = 128.8 s</td>
</tr>
</tbody>
</table>

**Special tools available on request**

Ø 13.5 mm – 28 mm  
Length up to 750 mm  
Material: GG25, GG26Cr, GG40  
The development of additional materials (GG26) and diameters is constantly ongoing. Contact us!

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**APPLICATION EXAMPLES**

<table>
<thead>
<tr>
<th>Component</th>
<th>Injection tool 60+2 HRC</th>
<th>Support 1,430</th>
<th>Tool</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread dimension</td>
<td>M6x(1.25), depth 16 mm, blind hole</td>
<td>M6x(1), depth 13 mm, blind hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool</td>
<td>MTMH3-Z M6 2.5xD SP</td>
<td>MTMH3-Z M6 2.5xD SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>1.2379 / 60+2 HRC</td>
<td>1,4301</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V speed</td>
<td>v = 30 m/min</td>
<td>v = 50 m/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed per cutting edge</td>
<td>$f₁ = 0.02$ mm (climb milling, left-sided M4)</td>
<td>$f₁ = 0.02$ mm (climb milling, left-sided M4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>dry (with air)</td>
<td>Emulsion 81%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Support Injection tool**

Test hole: 138 thread incl. core drill hole

Test hole: 618 thread incl. core drill hole

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**MTMH3-Z**

**CIRCULAR THREAD MILLING OF SOLID MATERIAL UP TO 66 HRC**

The new circular thread cutter for high-strength and hardened steels of up to 66 HRC combines core hole drilling and thread production in one tool, which significantly reduces the cycle and set-up times. The MTMH3-Z guarantees precise reliability and true-to-gauge threads. Two lubrication grooves on the shaft ensure optimal cooling with emulsion or air. Due to the special geometry of the flute with a high cut, reliable core hole and thread cutting is possible for nearly all steels. The left-cutting geometry stabilises the tool during thread cutting in synchronisation. Thanks to the temperaure-resistant TiSiN coating, processing can be done dry and wet. The MTMH3-Z is made of a special fine-grain carbide characterised by its high level of hardness, and it is optimally suited for hard processing.
The automotive industry in transformation: Alternative drive concepts such as the electric motor set completely new processing goals for suppliers. Machine builders and tool manufacturers have a duty to manufacture electric components with process reliability. The specialists in production and automation systems from GROB-WERKE Mindelheim and the tools manufacturer GÜHRING have a perfect and well-coordinated team in this context.

Manufacturers of electric components must stand up to the challenges presented by this new form of mobility. Modernisation and economic efficiency, as well as process reliability in component supply are of particular significance in serial production. One international automotive supplier has recognised this: Both GROB and GÜHRING have, as a long-term partner in the area of original equipment and a leader in the manufacturing of rotating precision tools, a cooperation founded in tradition, expertise, and trust. To be able to provide even better support to GROB and its clients with daily requirements of machining, last year GÜHRING opened a new centre for original equipment in Mindelheim, right next to GROB-WERKE. The solutions are milling tools with minimal cutting pressures. Thanks to highly positive rake angles and increased rigidity, the tolerances are reliably observed.

THE CHALLENGES OF THE FUTURE ARE CLEARLY IDENTIFIED

GROB and GÜHRING take great care to ensure for their customers that the topic of e-mobility is treated comprehensively, from a single source, and globally, and are therefore competent partners of the automotive industry worldwide in the serial production of electric drives. Thanks to the strategy of a diversified product portfolio and the ability to offer and supply all manufacturing processes for electric drives, the partners are well-prepared for the dynamical technological change in the automotive powertrain.

SUCCESS STORY

IDEAL PARTNERS FOR THE SERIAL PRODUCTION OF E-MOTOR COMPONENTS

GÜHRING is the traditional supplier of the automotive industry and has, just like GROB, outstanding manufacturing know-how and a complete and comprehensive product portfolio. GROB is the pioneer in plant engineering in serial production of e-machines and electric motors. Customers are guaranteed cost-efficient production in consideration of the costs per component and minimal cycle times for maximum output. For example, the slider bore requires high dimensional precision. The 6-cutting-edge GÜHRING PCD tool suitable for this has a diameter of 215 mm, a breakout tolerance of 27 microns, and weights less than 20 kilogrammes. This is an so-called lightweight tool made of aluminium, which delivers maximum productivity along with a reduction in spindle load.

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ALL COMPONENTS AT A GLANCE

Thanks to the strategic partnership between GROB and GÜHRING, reliable serial production of various forms of thousands of electric motor components is guaranteed for the reference customer today. For years, project groups and development teams at GROB and GÜHRING have been looking into e-mobility. In close exchange with the automotive industry, it was quickly determined that there is a high demand for production facilities for mass production in the automotive industry. This focus at GROB is on the core areas of electric motors and batteries. GÜHRING already offers winding technology, high-pressure technology, ion-coat and feed technology, and needle winding. And thus encompasses the entire manufacturing process of an electric motor, which includes the winding and forming processes, assembly and contacting. GROB and GÜHRING are thus able to process all the components of an electric vehicle that need to be machined. Proceed in addition to electric motor housings and associated gearbox covers are auxiliary units such as battery trays for the storage of energy accumulation and compressors, which are used for thermal management in vehicles. Battery trays are particularly susceptible to vibration due to their size of up to 2x1m and their thin walls. Primarily when rolling, this problem is mastered with the help of geometrical features, such as a strong unequal division of the cutting edges and a rigid tool interface, through interference-optimised retainers. With more than 20 successful battery housing projects, GÜHRING is the leader in this application. Processing with minimal lubrication also guarantees long-term sustainability in production. Here, too, the two companies can point out a large number of successfully implemented projects in the classic powertrain. Another challenge for electric vehicles is thermal management. Thus far, the internal combustion engine has driven the conventional air conditioning system. In future, the electric refrigerant compressor will be used as a heat and cold pump for electric vehicles. This consists of two spirals, the opposite movement of which compresses gas. The most efficient compression possible is achieved by tight tolerances of the spirals. The requirements for shape and position tolerance are, for example, an angularity of 30 µm and a circle of 0.5 µm. Removed surface qualities below Ra 5 µm in combination with thin-walled surfaces with wall thicknesses of less than 5 mm and contact heights up to 25 mm are representative of this machining task. The solutions are milling tools with minimal cutting pressures. Thanks to highly positive rake angles and increased rigidity, the tolerances are reliably observed.

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UBC Composites stands for outstanding expertise in the key technology of lightweight construction. As a specialist in this area, strong partners who support technical progress make a difference. This partner for UBC Composites is Gühring.

Growing challenges in the manufacturing processes as well as ever increasing demands of customers, primarily from the motorsport, automotive, aviation and boat-building fields, are always associated with extraordinary cutting tasks that UBC tackles together with Gühring. Here UBC Composites relies especially on Gühring’s manufacturing expertise:

“The design of the milling tools sometimes goes as far as the specification of the carbide composition, to be able to achieve the best possible cutting speeds and long tool life with optimal milling results,” says Flavio Budulig, Head of Operations at UBC.

“This not only guarantees the best possible processing of the lightweight components, but also ensures and implements cutting speeds, tool life, and an enormous savings potential.”

Lightweight construction always goes hand in hand with technical progress. As both the materials and the construction, joining, and manufacturing processes are continuously being further developed, close accompaniment of the tools used for manufacturing is essential. Here, tool manufacturer Gühring supports manufacturer UBC Composites comprehensively, personally, and from a single source.

UBC & Gühring: Here is a video with pictures from production, all interviews, and processing examples.

TOOL PERFORMANCE REPORT

TOOL COMPARISON MILLING / TRIMMING
COMPONENT WING OF A SPORTS CAR / MATERIAL: LAMINATE MADE OF CARBON FIBRE-REINFORCED PLASTIC
NEW. EXTREME. POWERFUL.

Ratio drill RT 100 XF

120 years of manufacturing expertise, innovative force, synergy: These are the pillars of our success that have allowed Gühring, a former drill pioneer, to grow into a full-service provider and market leader. This was possible thanks to our internal R&D areas in geometry, production and coating, and the manufacture of our own carbide as well as grinding and coating systems. This is what drives the performance of our products to continue setting new benchmarks for the sector.

The new ratio drill RT 100 XF crowns this advance in knowledge: its extreme performance and qualitative advantage. With overwhelming power and as a guarantee for outstanding machining results in your processes.

NEW CARBIDE XF AND NANOFIRE COATING

Extremely hard, absolutely unbreakable: The carbide especially developed for the RT 100 XF is a balancing act between hardness and toughness due to the unique combination of tungsten carbide and cobalt. The special structure of this composite cutting material has a resharpening effect. Big disruptions that accelerate tool wear no longer occur. The proven nanofire coating system consists of titanium and aluminium as well as a laminate, and is characterised by a high level of hardness and good thermomechanical resistance.

YOUR ADVANTAGES:

- Combined optimisation of all tool parameters enables extremely high feed rates and incredibly low nominal tool life
- In-house high-end finishing for maximum utilisation of the performance
- Reduced cycle times for hard-to-machine materials and special application cases in series production

OUTSTANDING AS STANDARD:

GEOMETRY AND MICROGEOMETRY

The robust cone-shaped point and the concave main cutting edge make the RT 100 XF an extremely stable drill tool for use in steel processing and for stainless steels, cast iron, special alloys and hard-to-machine steels (≤45 HRC). Four guide chamfers grip extremely early, thus perfecting the coaxiality, ensuring perfect workpiece quality, improving straightness and surface finish – and are therefore standard on the RT 100 XF from 5xD upwards. The third and fourth support chamfers ensure outstanding smooth operation. The chip flows through the polished flutes even faster, protecting the surface of the hole and at the same time significantly reducing the machining temperature.

TOOL PERFORMANCE REPORT

<table>
<thead>
<tr>
<th>Tool type</th>
<th>RT 100 XF</th>
<th>Solid carbide tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>1,0577 struct. steel</td>
<td>1,0577 struct. steel</td>
</tr>
<tr>
<td>Diameter (Ø in mm)</td>
<td>12.3</td>
<td>12.3</td>
</tr>
<tr>
<td>Cutting speed (m/min)</td>
<td>200</td>
<td>120</td>
</tr>
<tr>
<td>Feed per cutting edge (mm)</td>
<td>0.31</td>
<td>0.26</td>
</tr>
<tr>
<td>Tool life until change (component)</td>
<td>120</td>
<td>60</td>
</tr>
<tr>
<td>Total tool distance until change (m)</td>
<td>15.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Speed (1/min)</td>
<td>4787</td>
<td>2872</td>
</tr>
<tr>
<td>Feed rate (mm/min)</td>
<td>1484</td>
<td>747</td>
</tr>
<tr>
<td>Main time per component (s)</td>
<td>5.66</td>
<td>11.25</td>
</tr>
</tbody>
</table>

Triple tool life, shorter cycle times, happy users: the success story of the RT 100 XF as experienced by customers.
EMO 2019, the world’s leading trade fair for metalworking took place in Hannover from September 16 to September 21. Under the motto “Smart technologies driving tomorrow’s production!” the focus was on new developments and functions of Industry 4.0. Gühring is taking the decisive step towards the future and creating the optimal basis for future-oriented and digitised solutions.

EMO 2019, our highlights

Gühring presented the solid carbide drill RT 100 XF. The drill, made of specially developed carbide, comes over 120 years of manufacturing expertise and innovative strength. This results in extreme performance and incredible removal rates.

In the area of milling tools, the 5- and 7-cutting-edge versions of the RF 100 Speed series were presented. Due to the increased number of cutting edges, high material removal rates are also achieved in difficult-to-machine materials.
The mobility and independence of our trainees is a matter close to our hearts. That is why we provide them with their own trainee fleet: Whether for the way to the test, to other plants, to training courses or much more – trainee cars ensure the required flexibility. We wish our trainees a safe journey and look forward to seeing the trainee cars on the road!

THANKS
GÜHRING HONOURS
EMPLOYEES
WE EXPRESS OUR GRATITUDE

Each year, Gühring honours the company’s numerous employees celebrating anniversaries in a personal celebration. Oliver Gühring and Bernd Schatz thanked 40 employees for their commitment and long-term loyalty.

These people have been at Gühring for 40 years:

These people have been at Gühring for 25 years:
Edgar Hocher, Nikole Fletcher, Maria Gera, Nicole Gibbs, Frank Graftenberg, Michaela Hopp, Yvonne Iwanczuk, Rosiela Lai, Ali Ria Shaan, Joci Hentrich, Angelo Rizza, Wladislav Rudi, Hafidun Schnecker, Frank Scheuk, Abe Schenders, Constantine Schöner, Claudia Stöckl and Brita Wolfer.

Gühring apprentices in May 2019:
Dennis Bauer, Michael Kromer, Andreas Kehe, Martin Koch, Torsten Schüdich, Mara Zillhart, Tobias Staif, Robin Hennes, Stefan Leit, Erwin Nadolo, Tare Alikiani, Hubert Armas, Marcel Dockler, Jonas Keller, Avni Lütts, Dolen Merendi, Pascal Müller and Jonas Müller completed their training as industrial mechanics. Nico Dörner, Vidas Lēfīt, Moner Darke, Māra Liepakse, Wianget, Vika Dessel, Ambika Prick, Nina Riffenschuh and Moritz Wollf completed their training as mechatronic engineers. Tobias Bock and Friedrich Adrian are now trained cutting tool mechanics, and Lisa Pführen and Alena Sitzenfleisch are now industrial management assistants. Martin Wichterstorl completed his studies in business informatics, Julia Reinhartgen in industrial engineering and management, and Nicola Maier Schöberg is in industrial business administration.

Gühring apprentices in September 2019:
Maks Adeland, Fatmir Bòttner, Irene Fešaj, Daniel Grom, Daniel Karthausmann, Andreas Kneissl, Lucas Löffel, Tamara Sawetinov, Lahina Miser, Armin Schmiedt and Jannik Huber completed their training as industrial mechanics. Mike Borstef, Gudrun Kersacro and Edgmar Bismemaker are now cutting tool mechanics. Raphaël Haag and Johannes Unzel are now trained mechatronic engineers. Jonas Dörner and Manuel Gür are IT specialists for application development and system integration. Sascha Migo, Oskana Cahay, Lisa Colin, Jan Ruthfisch and Oliver Schubert are now trained industrial management assistants.

Every year, over 50 young people in Albstadt and Laiz decide to start their careers at Gühring. The apprenticeship ended for 56 trainees in spring/summer 2019. We thank you for the trust you have placed in us and wish you success in your future careers. Gühring once again demonstrates its high quality of technical training and can be proud of a national winner, two chamber winners, and the regional winner of the IHK Reutlingen.

Wir gratulieren!

Max Bartschat 2nd National Winner (1st State Winner, 1st Chamber Winner)
Performance competition “Profis leisten was!” Cutting tool mechanic

Adrian Friedrich 2nd Chamber Winner
Performance competition “Profis leisten was!” Cutting tool mechanic

Edgar Billmann 3rd Chamber Winner
Performance competition “Profis leisten was!” Cutting tool mechanic

Martin Weib 1st State Winner
IHK final exam winter 2018/19 | Mechatronics engineer

A GOOD RIDE IN EVERY WAY
COMPETENCE CENTRE FOR MICRO-CUTTING
TREUEN IV

What started in Treuen in 2012 with the 1st threading tool plant is a special success story from Vogtland. Back in 2013 and 2015 Dr. Gühring grew further and built plants 2 and 3, where tools made of high-speed steel and highly specialised special tools are produced. Now, in 2018/19, there has been an expansion from a mere production site to a pool of competences.

With the competence centre for micro-machining, the production of different tool groups for an entire sector is represented in one plant, and is unique in this form. As micro-machining is becoming increasingly important in the metal industry, it is important to secure competitiveness, to pool competences, and to be able to act flexibly due to shorter routes.

Manufacturing, design, product management, and a proprietary test field for the micro tool product area all converge in Treuen. The smallest machining requires a number of tool adjustments such as cutting edge geometry, tool material and coating technology, which can be efficiently implemented through such pooling. Drilling, rolling and routing tools are now made from solid carbide in the micro-range in Treuen. The test range is used in evaluation, precision engineering, jewelry, electrical engineering and tool making industries. On over 4,000 square meters, the general conditions are adapted to the high-precision production. The storage and flow of parts are just as modern as a driverless transport system for the distribution of resources. Innovative measurement technology and a test field with high-performance complete machining centres ensure precise evaluation of the machining tools.

Dr. Gühring provides a complete range for all micro machining applications for the ever smaller parts and structures in the micro range from the most varied sectors. Specially adapted geometries, substrates, and surfaces guarantee optimal performance and process reliability for a wide variety of materials and machining applications in the micro range. Our variety of micro tools ranges from the smallest drill bit Ø 0.05 mm to special solutions made from specially developed carbide. The micro tool range includes over 75 types in more than 2,400 dimensions and thus offers tool solutions in stock for many applications.

THE DIVERSITY OF OUR MICRO TOOLS

Dr. Gühring Treuener Höhe 4-7, 08233 Treuen
www.dr-guehring.de
Perfect tools and processes
Machine connection
Networking & data assessment
Reduced costs
Real-time transparency
Uncover improvement potential

YOUR ADVANTAGES:

- Uncover improvement potential
- Real-time transparency
- Reduced costs
- Networking & data assessment
- Machine connection

MACHINE CONNECTION GMCC
With the GMCC option, Gühring offers the option of a direct machine connection. This makes it possible to monitor machine conditions at any time. Through permanent life cycle analysis, optimisation potential is quickly uncovered. Stored emergency plans when the machine is at rest, alongside field help personnel, help to resolve the problem quickly and efficiently. The failure analyses offer the possibility of recognising patterns to avoid future failures. The aim is to turn disruptions into productive service times.

TOOL LIFE AT A GLANCE
The machine monitoring provides a permanent overview of the available tools including the corresponding remaining service life and automatically takes over wear detection. All information about the machine conditions can in turn be used for order planning. Users plan more efficiently, and productivity is significantly increased. A shorter reaction time in the event of tool breakages and the evaluation of the actual tool life are additional advantages to ensure that the machine is optimally equipped for the requirements.

THE GTMS SEES MORE
With process data monitoring, parameters such as machining times, an active NC program, tool costs, performance data and much more can be monitored, documented and evaluated. This way, processes are more stable because a faster root cause analysis is possible in the event of disruptions. Furthermore, cost drivers in the production process can be identified quickly and easily.

Technical data | Process optimisation
Records: 30, 34, 40
Silent chart:

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<tr>
<th>Chart 1</th>
<th>Chart 2</th>
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- 35 - 5768 3,000 3-cutting-edge V1 spindle capacity: 1.5686 / 50.4333%
- 35 - 5116 1,000 2-cutting-edge V1 spindle capacity: 1.5564 / 32.7221%
- 34 - 5768 3,000 3-cutting-edge V3 spindle capacity: 1.5625 / 56.3721%
- 33 - 5116 3,000 3-cutting-edge V3 spindle capacity: 1.5564 / 33.0750%

MACHINING CENTRE
Machine running: 7:44 hours
Expected end of order: 31/01/2019

Machine counter:

- 35 - 5768 3,000 3-cutting-edge V1 spindle capacity: 1.5686 / 50.4333%
- 34 - 5768 3,000 3-cutting-edge V1 spindle capacity: 1.5625 / 56.3721%
- 33 - 5116 1,000 2-cutting-edge V1 spindle capacity: 1.5564 / 32.7221%

Technical data:

- spindle capacity: 1.5686 / 50.4333%
- spindle capacity: 1.5625 / 56.3721%
- spindle capacity: 1.5564 / 32.7221%
- spindle capacity: 1.5564 / 33.0750%

Machine: ZORN  |  Created on: 23/08/2019  |  Record ID: 32  |  Date: 18/07/2019  
StatusCH01: In production  |  ProgCycleCH01: N350 G4F5
Spindle capacity: 1.5686 |  ProcCycleCH01: N350 G4F5
Spindle capacity: 1.5625 |  ProcCycleCH01: N350 G4F5
Spindle capacity: 1.5564 |  ProcCycleCH01: N350 G4F5
Spindle capacity: 1.5564 |  ProcCycleCH01: N350 G4F5

Machine running: 7:44 hours
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Machine counter:

- spindle capacity: 1.5686 / 50.4333%
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