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Highly efficient grinding machines and solutions from DF Precision

Grinding solutions from Hardinge Kellenberger, Okamoto and Voumard will be showcased at EMO 2023. These companies are represented in the UK by DF Precision Machinery.

With the new VOUMARD 30 internal grinding machine, Swiss grinding specialist Hardinge Kellenberger has rounded off the high-precision internal grinding expertise of the Voumard brand by adding a machine for all industries whose main focus is on simple internal grinding operations in the small and medium series. The VOUMARD 30 is designed for workpiece lengths up to 150 mm and diameters up to 150 mm. With a footprint of 1.80 x 1.80 m, this very compact machine is particularly interesting for small and medium-sized companies.

The high-end internal and external cylindrical grinding machine VOUMARD 1000, already well established in the market, will be shown at the EMO in a new version with a grinding length up to 600 mm and an extended table with the possibility of using a steady rest, ideal for machining long shafts and spindles with high requirements for concentricity. The kinematically flexible machine design of the VOUMARD 1000 features two linear axes and two rotary axes.

The two universal cylindrical grinding machines KELLENBERGER 100 and KELLENBERGER 1000 exhibited at EMO are equipped with many new features for superior grinding results. The KELLENBERGER 100 comes with the innovative gTOUCH integrated structure-borne



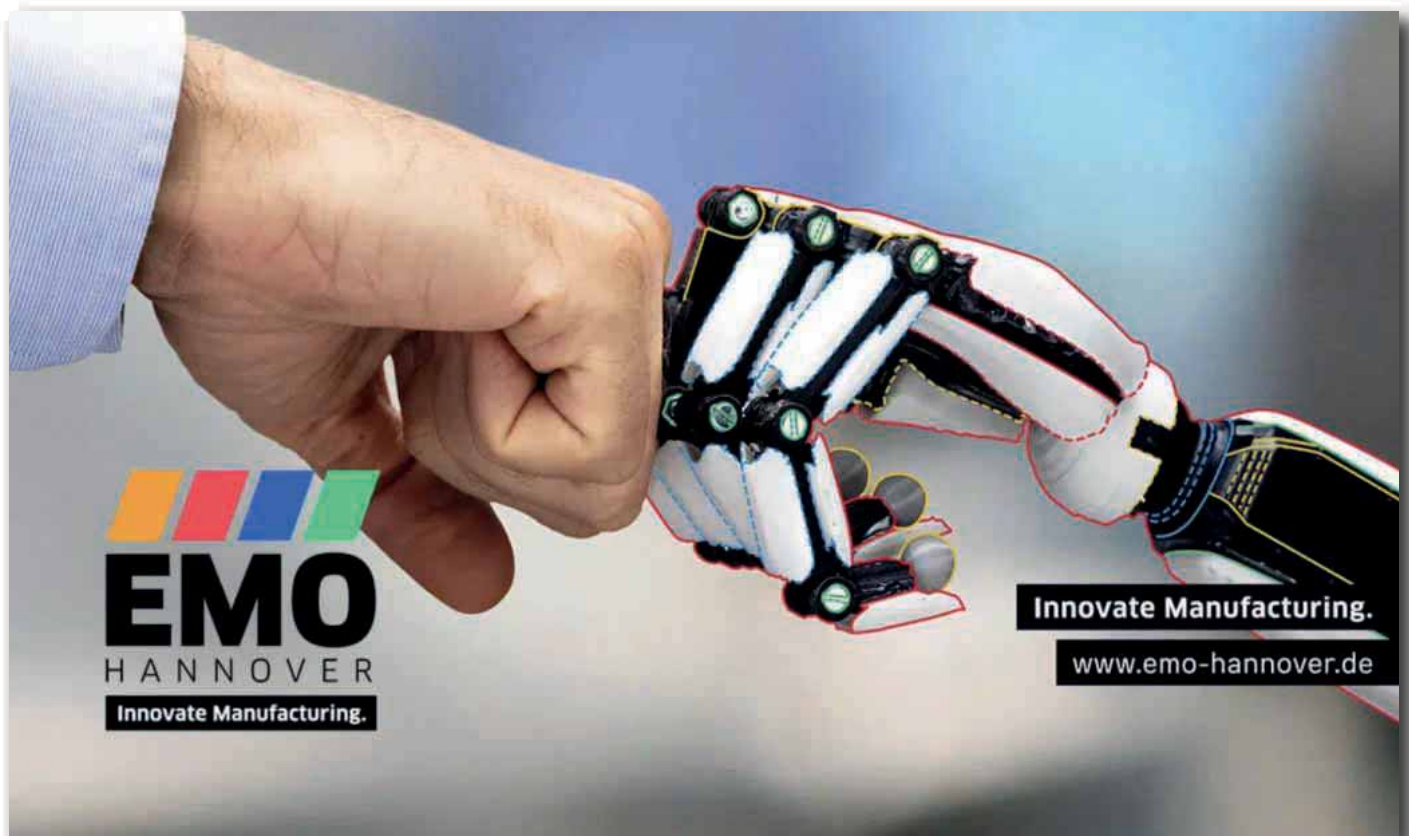
sound sensor system, a consistent further development of the proven KEL-Touch sensor system, which will in future be known as gTOUCH.

At EMO, Okamoto will proudly present a new addition to the ACC-CAiQ Series. The ACC-CAiQ range with sizes from 600 x 400 up to 1,000 x 600 has been extended with the addition of 3 new larger heavy-duty sizes, the PSG-126CAiQ with a size of 1,200 x 600, the PSG-127CAiQ with a size of 1,200 x 700 and the PSG-157CAiQ with a size of 1,500 x 700.

The new larger models benefit from an extremely robust heavy duty main machine casting with a new moving column design that features a high-level column cross slide that further increases the rigidity and strength of the machine. Starting with the 1.2 m size, these larger machines are also delivered with a heavy-duty wheel-head together with a 15 kW spindle motor and a Ø510 mm grinding wheel. Despite having a longer table stroke, the cycle time is reduced thanks to a ball-screw table drive with 40 m/min feed rate.

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Leading trade fair for production technology returns

International manufacturers of production technology will be presenting smart technologies for the entire value chain at EMO Hannover 2023 from 18th to 23rd September. Under the banner of Innovate Manufacturing, the leading trade fair for production technology will showcase the entire range of modern metalworking technology which is at the heart of every industrial production process. The latest equipment will be on display, as will efficient technical solutions, product-related services, sustainable production methods and much more besides.

The main focus of EMO Hannover is on cutting and forming machine tools, manufacturing systems, precision tools, automated material handling, computer technology, industrial electronics and accessories. EMO visitors come from all major industrial sectors including machine and plant construction, the automotive industry and parts suppliers, aerospace technologies, precision engineering and optics, shipbuilding, medical engineering, tool and mould making, steel and lightweight construction.

EMO Hannover is the number one international meeting place for the industry. More than 2,200 exhibitors from 47 countries attracted nearly 120,000 trade visitors from around 150 countries at EMO Hannover 2019.

The claim of EMO Hannover is Innovate Manufacturing. This is aimed at industry, the exhibitors and visitors and EMO Hannover itself. All are facing major challenges and must constantly reinvent themselves if they are to survive in the international competition. The future of business, the future of connectivity and the future of sustainability in production are three topics that are currently dominating the business, political and social discussion in most industrialised countries. Production technology is helping to put forward solutions in all three fields. EMO Hannover will show everyone how. Carl Martin Welcker, EMO general commissioner explains: "At no other event in the world does the international production technology community, both the manufacturer and user sides, come together as cohesively as at EMO Hannover.

What better place is there to discuss and showcase the latest trends, challenges and solutions than here."

International production technology is changing at an unprecedented speed. As a leading trade fair for the machining industry and an international business platform, EMO is not only part of this change, it is actively shaping it. Since the services and products of its exhibitors now extend far beyond metalworking, the focus is even more clearly on the entire production technology than before. In addition, related topics and aspects such as industry-wide and cross-industry networking and training are moving more into focus.

Year-round communication platform for production technology

EMO Hannover makes this claim not only during the trade fair itself, but 365 days of the year, before and after the events as well as in between. Interested parties can find out more at www.emo-hannover.com/news about topics such as establishing new markets, ensuring the security of supply for energy and vendor parts, networking, data

security and new business models, the introduction of artificial intelligence to production, sustainability and energy efficiency, digital training and support in combating the shortage of skilled workers, as well as new products, solutions and services for production to name just a few. Production experts, machine suppliers, scientists, economic experts, company leaders and political decisionmakers will all be on hand to give their views. "The broad range of topics is evidence that production technology sees the importance of the bigger picture and is not an end in itself," explains Carl Martin Welcker. "Comments and dialogue are most definitely welcome."



Separate IIoT in production exhibition area

Innovation in production technology is increasingly being triggered by software solutions. For this reason, EMO Hannover is planning to feature a separate IIoT in production exhibition area. It will bundle IT solutions of all kinds, from data analytics, data management, digital twins and cloud services through to process monitoring, predictive maintenance, AI and cyber security. The target group is international IT manufacturers looking to appeal both to manufacturers and SMEs with their digitalisation offerings and also to the many small and medium-sized providers of digitalised manufacturing solutions. They will encounter exhibitors from the entire value chain at EMO Hannover, including everything from production planning, manufacturing and automation through to quality assurance. The individual steps are intelligently networked in the factory by means of IoT solutions. These

include horizontal networking between machines, systems, tools, measuring devices, etc. on the one hand and vertical networking from the shop floor to the cloud on the other. "EMO Hannover offers great customer potential for all companies in networked manufacturing, from both the exhibitor and visitor sides," confirms Dr Wilfried Schäfer, executive director of VDW (German Machine Tool Builders' Association.)

Focus topic: Sustainability in production

Industry, too, is struggling to make itself more sustainable amidst the current debate surrounding climate change. This covers a whole range of aspects such as rapidly rising fossil energy prices, the reactivation of coal and nuclear power plants, the EU Green Deal, expanding renewable energies and improving the resilience of supply chains. Sustainability is a mega topic which is set to occupy business and society in

general for many years to come, which is why it has been included as one of the Future Insights at EMO Hannover 2023.

As an enabler for greater sustainability in industry, production technology is at the heart of the inevitable transformation process. Technical solutions incorporated into machines to minimise CO₂ emissions are one side of the coin, improving the energy efficiency of the production process is the other.

"It will take a major effort by all stakeholders, suppliers and users to achieve the desired savings. But the transformation also offers opportunities for companies," says Dr Wilfried Schäfer. "Businesses and researchers need to pull together on this. That's why VDW, in cooperation with WGP, is using EMO Hannover as a platform to create more transparency on what's available."

This will include a special sustainability stand which will present the energy efficiency initiative of WGP, the association of leading production scientists in Germany. It is designed to help small and medium-sized enterprises in particular to make immediate savings through greater energy efficiency. A joint science stand spotlighting sustainability projects is also planned.

"The whole point of EMO Hannover is not only to showcase practical solutions for industry, but also to highlight research trends that could be marketed as tomorrow's solutions," concludes Dr Wilfried Schäfer. "That's why it is important to network all the exhibitors who are making a contribution in this area and to publicise their involvement."

<https://emo-hannover.com/>



World premieres and winners from ANCA

CNC grinding technology pioneer ANCA will showcase its latest products and industry-specific grinding and automation solutions at EMO. The winner of its renowned Tool of the Year competition will be announced live at the exhibition.

Never ceasing in its commitment to creating the highest quality product, years of continuous refinements at ANCA have made the ULTRA technology possible. ANCA's unique vertical integration is key to its success, where machines, controls, drives and precision components are all designed and manufactured in-house. Successfully introduced to the industry last year on the MX machine platform, it boasts the highest accuracy and quality cutting tools in the world. In fact, the MX7 ULTRA achieves one nanometre axis resolution and can maintain better than ± 0.002 mm line form accuracy of any profile which includes ballnose and corner radius endmills.



At EMO, visitors will find out how ANCA spreads the ULTRA advantages to further fields of application, including smaller batches, regrinding and tools with small diameters.

The FX7 ULTRA introduces cutting-edge technologies, including ANCA's unique nanometre control, that revolutionise precision grinding for small and micro tools down to 0.1mm diameter. This significant technology breakthrough is already redefining the standards for tool and component grinding with the highest levels of accuracy and surface finishes.

New software, hardware and design features significantly improve surface



finish, accuracy and controlled runout, ensuring batch consistency from the first ground tool to the last.

From blank to a finished high-quality tool, all on one machine, ANCA's ultimate single setup solution for complete machining of cutting tools will be demonstrated on the MX7 ULTRA at EMO. Following a legacy of machine efficiency, this latest solution combines peel grinding and tool grinding on the one platform, enhanced with additional power to extend capability. The MX7 ULTRA's remarkable spindle power of 26 kW can handle demanding tools like larger taper ballnose endmills, step drills, and aerospace components ranging from 0.1 to 25.4 mm. This leads to reduced cycle times and increased productivity.

By utilising the latest innovations in peel grinding technology, ANCA guarantees exceptional stability, accuracy and value, all achieved on a single machine. Manufacturers can now produce high-quality tools with confidence, knowing that the MX7 ULTRA delivers outstanding results.

ANCA has further developed its AIMS system for automated tool production. At EMO, visitors can see examples from the field, with systems operating completely unattended over extended periods.

The AIMS automation package is a modular and growing system, spanning across the tool production process. ANCA is set to include additional operations like blank preparation or laser marking in the automated process. The system's intelligent design allows for progressive steps of automation, including an automated laser marking station AutoMarkX. The versatile laser marking station is tailored to meet the needs of tool manufacturers.

The AutoMarkX's new, retrofittable rotary

workholding system allows for unlimited index marking around the tool, with automatic Z-axis focus and compatibility with tool shanks from 3 to 32 mm. Moreover, the AIMS Autoline Basic, the standard interface for easy loading at the AutoMarkX enables customers to experience smoother material transfer between machines.

ANCA's expertise in grinding solutions extends to blank grinding and integrated complete machining of gear tools, including in-process measuring and compensation. The CPX blank preparation machine will feature productivity-enhancing features in Hannover, including automated loading of tools up to 32 mm, a flip station for grinding from both ends, tailstock and extensive probing enabling statistic process control.

One of the most eagerly awaited events at ANCA's stand will be the announcement of the Tool of the Year 2023 competition winner. This prestigious competition brings together tool manufacturers from around the globe, who compete for the title of the best real and virtual tools. The judging process, overseen by a panel of ANCA and external experts, evaluates precision, surface roughness, creativity, and practical use. The award ceremony promises to be a highlight of the exhibition, recognising the industry's most innovative and exceptional tools. Visitors will also experience exclusive product launches to be revealed at the show.

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At EMO, visitors will find out how ANCA spreads the ULTRA advantages to further fields of application, including smaller batches, regrinding and tools with small diameters.

Scan to learn more




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Klingelnberg to present innovative solutions for renewable energy

Systems supplier Klingelnberg will once again be exhibiting at EMO. In addition to numerous machine demonstrations, it will also be offering a dedicated lecture series directly at its booth.

In recent years, the company has worked continuously with many of its customers to analyse the challenges presented by renewable energies, such as electromobility and wind energy and incorporate them into its development process. The high standards in regard to noise behaviour of gears in electric cars are a key aspect that has come to light based on numerous discussions. This has led to new products and advances in existing products that are designed to manufacture application-specific, high-quality gears on a cost-effective basis, now and in the future. The highest profile addition to its portfolio is the Höfler Roll Testing Machine R 300 for torsional acceleration testing of gears. Klingelnberg will also be exhibiting the Höfler cylindrical gear grinding machine Speed Viper and the series P 152, P 40 and P 26 precision measuring centres.

The metrology on the Höfler cylindrical gear roll testing machine R 300 provides a reliable way to determine the root causes of gearbox noise. Due to the short measuring time, it can be easily integrated into any manufacturing process and enables 100 percent quality control of the gears produced. The R 300 is designed for all roll testing processes that are relevant for evaluating the running behaviour and noise behaviour of gears. These include the single-flank test, the structure-borne noise test and torsional acceleration test and the double flank test. Depending on its



equipment, the R 300 enables testing of gears and shafts.

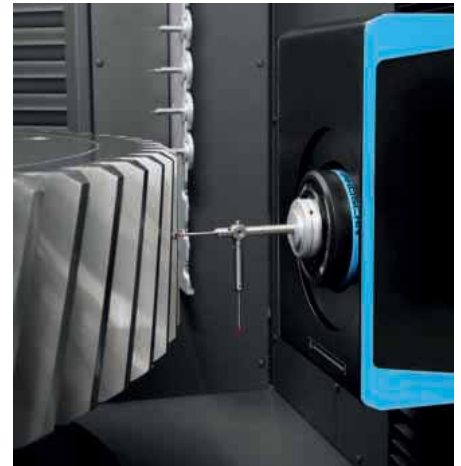
A 100 percent quality control of the gears can be carried out either as an incoming inspection for assembly or immediately after hard finishing of the gear in production. The advantage of the latter option is that only OK parts are passed on to the next process step, thus preventing any rejects from undergoing the finishing process. The Klingelnberg production cell, consisting of the Höfler Speed Viper, the CompactLoader and the integrated Höfler Machine R 300, is ideally suited for this purpose. The production cell can be equipped with all machine models in the Speed Viper series, from the Speed Viper 80°, dual spindle, to the Speed Viper 300.

What's more, the R 300 is networked with Klingelnberg's GearEngine®, making it possible to use roll testing data for production evaluation and tolerance management.

The increasing cost pressure on large components for wind power requires new technologies that will enable proven principles for high-volume and mass production of smaller components to be transferred over to large components. The newly developed Klingelnberg precision

measuring centre P 152 closes the gap in the portfolio between the mid-sized and the large precision measuring centre model series.

The latest addition to the family is capable of measuring components with a maximum outside diameter of 1,520 mm and workpiece weights up to 8,000 kg with the usual



measurement precision. Despite this heavy workpiece weight, no special foundation is required. Klingelnberg has succeeded in scaling the technology concept of the small and mid-sized series to the larger component dimensions.

The introduction of hybrid metrology with optical pitch measurement has significantly reduced measurement times. It is now possible to perform optical pitch measurement on almost all surfaces using the white light sensor technology, developed by Klingelnberg and partners, along with other innovative measuring strategies. Two other processes for reliably measuring single pitch deviations are also available.

For the first time, Klingelnberg will offer interested trade show visitors live presentations in a short-seminar format on the subjects of aviation, wind energy, and automotive applications. Digital solutions for smart production will also be part of the lecture series. At scheduled times, the team of experts will give 20-minute presentations followed by a discussion in German and English directly at the trade show booth in the company's own Gear Campus. Pre-registration is not required.

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Klingelberg has continuously analyzed the challenges of renewable energies, such as electromobility and wind energy, and incorporated them into its development. This has resulted in new products as well as further developments that will ensure the production of high-quality and economical gears in the future.

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Highlights at the EMO 2023

Subject to changes



R 300

Cylindrical gear roll testing machine to make gear noise visible



Speed Viper

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Hybrid Metrology

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P 152

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European launch for three new larger capacity Okamoto precision surface grinders

At EMO, Okamoto will present a new addition to the ACC-CAiQ Series. The ACC-CAiQ range with sizes from 600 x 400 up to 1,000 x 600 has been extended with the addition of three new larger heavy-duty sizes, the PSG-126CAiQ with a size of 1,200 x 600, the PSG-127CAiQ with a size of 1,200 x 700 and the PSG-157CAiQ with a size of 1,500 x 700.



The new larger models benefit from an extremely robust heavy duty main machine casting with a new moving column design that features a high-level column cross slide that further increases the rigidity and strength of the machine. Starting with the 1.2 m size, these larger machines are also delivered with a heavy-duty wheel-head together with a 15 kW spindle motor and a $\varnothing 510$ mm grinding wheel. Despite having a longer table stroke, the cycle time is reduced thanks to a ball-screw table drive with 40m/min feed rate.

All CAiQ Series machines benefit from an extremely rigid main casting with fully supported slide ways to guarantee the highest stability and accuracy. Double V hand scraped table slideway ensures that the lubrication oil is perfectly distributed to ensure a flat surface and straight table movement.

The touch screen FANUC control, that has proven so popular with existing users of the CAiQ Series, has been further developed and made even quicker and easier to set both in production and in tool room environments. The new FANUC control offers an even faster response, with a larger high-definition touch screen with sharper graphics.

Graphical representation of common user-friendly grind patterns and wheel shapes are quickly set up directly on the touch screen view panel with the help of the iQ function. The iQ function can automatically set the optimal grinding conditions, simply by entering the grinding wheel mesh/grit size.

The attractive two tone colour and ergonomic design of the fully enclosed table cover, with interlocked sliding door, allows modern large volume high pressure coolant systems to be used, to increase productivity while keeping the workshop environment clean.

European launch of new Boxer style Okamoto IGM15NCIII-2B Twin Spindle Internal grinding machine

Okamoto will present the new IGM15NCIII-2B Twin Spindle Internal

Grinder. The new "Boxer" type internal grinder features independently moving wheel spindles for different sized grinding wheels allowing multiple external and internal grinding operations with more flexibility and capacity, in the same loading to be carried out.

The IGM15NCIII-2B can swing up to $\varnothing 260$ mm inside the chuck cover with a grinding length of around 125 mm. Okamoto offers a wide selection of wheel spindles with speeds ranging from 6,000 to 60,000 rpm. The wheel spindles are mounted in high rigidity quick change dovetail housings and driven via Fanuc High Torque 2.2 kw AC motors.



To further enhance the flexibility and capacity of the machine, the design also features a swing-down dressing arm, a two-axis manual pulse generator handwheel with 0.1 μ m increment and joystick control of the rapid feed of both axes. To ensure maximum efficiency, the "Boxer" is equipped with a coolant supply through the work-head and a programmable coolant flow to each wheel spindle and the dressing station.

The machine construction features a highly rigid large section bed structure with fully supported linear guide slideways for added stability. AC servo motors are directly coupled to the ball screws for spindle and work-head infeed and for high accuracy wheel positioning.

Like the other machines in the IGM-15NCIII Series, the new machine uses the latest FANUC Oi control with touch screen interface and with FANUC drives on all axes. Using the Okamoto Grinding Data Automatic Setting Function, with data input via the touch screen operator user interface, complex workpieces featuring internal bores, tapered bores, external diameters and shoulder faces can be easily and efficiently ground in one continuous cycle.

The Okamoto Grinding Data Automatic Setting Function automatically sets the most suitable grinding parameters, according to the many years of experience of Okamoto, after inputting only the wheel grain size and wheel width.

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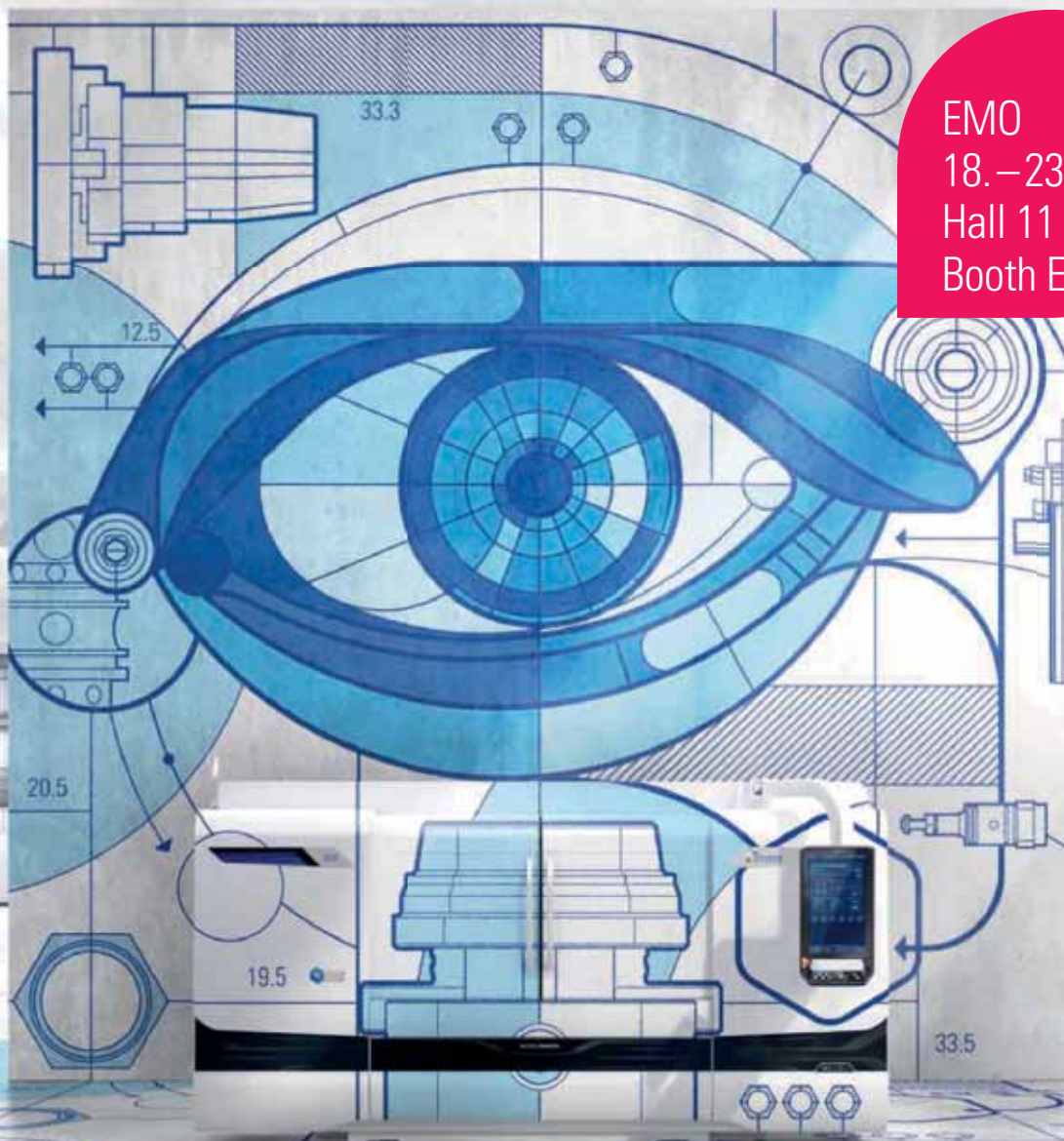
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 **STUDER**

Optimising processes

EMO 2023 will be the setting for the official unveiling of the Rollomatic smart factory, a proven concept developed over the years to meet the new challenges faced by tool manufacturers. The new Lasersmart®810XL, designed for machining large-diameter tools, will also be in the spotlight in Hannover, as will the high-performance LEAN grinding solutions from the Smart autonomous grinding programme and the Strausak solution for resharpening and special tools production.

Customers are at the heart of Rollomatic's philosophy. This is also the case when it comes to thinking ahead and being proactive in offering the best manufacturing solutions. This philosophy has led the company to develop the especially effective Smart Factory programme. It provides a new way to organise production resources using information technology, machine communication systems and robotics. Rollomatic's extensive experience in the above-mentioned fields enables it to support customers throughout the Smart Factory process. Cutting tool manufacturers want more autonomous machines in order to cut production times without skimping on operational quality. Rollomatic has mastered the production stages, is constantly optimising processes and, above all, understands what customers need. Its Smart Factory solutions can satisfy those needs.



The company's laser solutions are the most effective offerings on the market for cutting ultra-hard materials and 3D machining. With the new Lasersmart810XL, specifically designed for machining large-diameter tools, Rollomatic covers a very wide range of possible applications. Designed for the production of cutting tools in ultra-hard materials and featuring six simultaneously interpolated axes, the new,



ultra-compact Lasersmart810XL has been designed to machine tools up to 300 mm in diameter, 350 mm in length and weighing up to 15 kg. An automatic loader with a capacity of 30 parts is included as standard. The Lasersmart810XL is the perfect solution for machining ultra-hard tools used in the automotive, aerospace and woodworking industries. The Lasersmart®510 femto offers unlimited machining possibilities and maximises productivity, precision and surface quality. In addition to PCD, P-CBN, CVD, MCD and natural diamond, the Lasersmart 510 femto can machine ceramics, carbide, sapphire, glass and new combinations of materials. Thanks to this revolutionary machine, users can achieve results that set a new standard for machining ultra-hard materials.



The LEAN philosophy has anchored Rollomatic for many years. It forms an integral part of our corporate culture and permeates the design of all our products. Reducing lead times, non-productive and non-value added time and optimising process management are just some of the challenges facing today's machine fleets. The Grindsmart®660XW is a perfect illustration of what LEAN can do. With the Grindsmart®830XW machine, Rollomatic can now offer grinding solutions for the entire range of micro and macro tools.

Strausak, which celebrates its 100th anniversary this year, joined the Rollomatic

Group in 2011. As part of the group, it helped expand the range of sharpening solutions for cutting tools, as evidenced by Strausak ONE, its flagship model. This latest-generation 5-axis grinding machine has been designed for the production of special tools, inserts or resharpener. Adapted to unpredictable events, the Strausak One combines precision and efficiency. Possibilities are endless thanks to its easy programming on Numroto.



Rollomatic has carried out a complete overhaul of its digital customer portal. MyRollomatic brings together all the services that enable users to increase efficiency and speed. It also includes new features. The intuitive dashboard provides access to all machine documentation, software and the Rollomatic learning centre. It offers an easy overview of the production status, via RMonitor and of the history of service calls on machines. Customers can also issue a support ticket directly if they need to. The learning centre, a teaching platform that was set up a few years ago as a knowledge base of Rollomatic's expertise, is constantly being optimised with the aim of providing tools that will quickly make operators autonomous. It now offers over 200 hours of training in six different languages. Different levels are offered, from basic to expert, depending on the production goals set by the customer. It also offers new courses, tutorials, access to documentation and team management features for production managers.

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New VOUMARD 30 grinding machine concept and wide range of new automation solutions

With the new VOUMARD 30 internal grinding machine, Swiss grinding specialist Hardinge Kellenberger has rounded off the high-precision internal grinding expertise of the Voumard brand by adding a machine for all industries whose main focus is on simple internal grinding operations in the small and medium series. The VOUMARD 30 is designed for workpiece lengths up to 150 mm and diameters up to 150 mm. With a footprint of 1.80 x 1.80 m, this very compact machine is particularly interesting for small and medium-sized companies. With its very good price/performance ratio, it is also an ideal entry-level machine. When it comes to equipment, the VOUMARD 30 makes no compromises. Depending on the application, either one or two parallel internal grinding spindles can come into operation. These high-quality internal grinding spindles ensure the best grinding results with short cycle times.



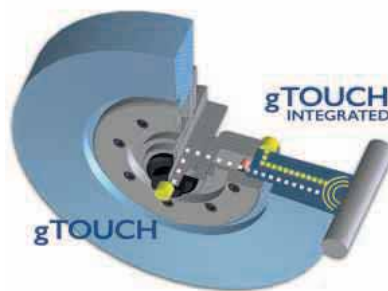
The machine is equipped with a FANUC 0i control with the latest BLUE Solution software generation, which is now standard on all Voumard and Kellenberger grinding machines. BLUE Solution is characterised by simple, fast and intuitive touch operation. The operating elements are designed so that they can be quickly grasped and logically selected. The special feature: During data entry, the operator is optimally supported by an intelligent control system. This system is equipped with a plausibility monitor that indicates incorrect entries. The operator can then readjust his entries. For automatic loading, the VOUMARD 30 can be equipped with a robot. The special feature: the robot can be optionally integrated into the machine enclosure.

The high-end internal and external cylindrical grinding machine VOUMARD 1000, already well established in the market, will be shown at the EMO in a new version with a grinding length up to 600 mm and an extended table with the possibility of using a steady rest, ideal for machining long shafts and spindles with high requirements for concentricity. The kinematically flexible machine design of the VOUMARD 1000 features two linear axes and two rotary axes.

The two universal cylindrical grinding machines KELLENBERGER 100 and KELLENBERGER 1000 exhibited at EMO are equipped with many new features for superior grinding results. The KELLENBERGER 100 comes with the innovative gTOUCH integrated structure-borne sound sensor system, a consistent further development of the proven KEL-Touch sensor system, which will in future be known as gTOUCH.



The gTOUCH integrated was developed upon the request of Kellenberger and in



intensive cooperation with the manufacturer specifically for the design conditions of the KELLENBERGER 100, whose spindle motor is equipped with a direct drive. Noise from the motor can impair the sensitivity of the sensors mounted on the spindle. The new highly sensitive gTOUCH integrated sensor system has, as a consequence, been integrated into the grinding wheel flange and is now



located at the closest point to the source of structure-borne noise, directly on the grinding wheel.

The Kellenberger product specialists have expanded the existing product portfolio of automation solutions and added the newly developed Automation FLY to the FLEX and STEP automation solutions that have proven themselves on the market.

The KELLENBERGER 100 will be shown at EMO with this new Automation FLY, which offers the ideal entry into machine automation in the basic segment with its compact, modular design.

The FLY loader is designed for shaft parts up to \varnothing 60 mm, length up to 600 mm, as well as chuck parts up to \varnothing 100 mm and workpiece weights of max. 5 kg in alternating mode, length up to 280 mm and 10 kg in single part mode. Due to its compact size of 1,200 x 1,400 x 2,200 mm, it can be easily integrated into any production environment.

Automating grinding processes on workpieces of differing lengths is a challenge. The design engineers at Kellenberger developed an integrated positioning axis, Z2 axis, for this task for the KELLENBERGER 1000, which ensures automatic length compensation during fully automatic loading by a robot or gantry loader. Previously, the workpiece headstock or tailstock had to be repositioned manually for the necessary length compensation during workpiece change. The Z2 axis reduces the changeover time by around 80 percent.

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Hall 11 – Stand E64 & E65

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UNITED FOR YOUR SUCCESS

The UNITED GRINDING Group will again be represented with a prominent booth at EMO. On its 1,000 m² stand, the Group will present 16 machines, including some new launches, as well as innovative products and services from the "Customer Care" area.

The UNITED GRINDING Group, one of the world's leading manufacturers of grinding, eroding, laser and measuring machines as well as machine tools for additive manufacturing, is considered one of the pioneers in the development of innovative technologies in its industry. "Innovate Manufacturing" is the motto of this year's EMO Hannover, therefore, the group cannot be absent.

Customer Care, special exhibition area and machine highlights

With its special exhibition area, this year, the group is placing a focus on Customer Care. This includes all products and services that accompany customers during the service life of their machines and support them in efficient production, from "start up" to "retrofit". Nevertheless, visitors to the trade show can also obtain comprehensive information about all of the group's digital assistance systems. These include the Production Monitor, the Service Monitor and the Remote Service, which are grouped under the name UNITED GRINDING Digital Solutions™. In addition, further digital solutions will be presented at EMO.

Moreover, the public can look forward to

several innovations and highlights among the 16 machines on display:

BLOHM, the specialist for surface and profile grinding machines, is celebrating a world premiere: the PLANOMAT XT 408 with automatic workpiece loading and unloading is a new solution for internal machining of hydraulic motor stators.

STUDER will also present a novelty: an innovative automation solution that will be on display on the S31 universal external cylindrical grinding machine.

WALTER is presenting the innovative "Laser Contour Check" measuring system for the first time at EMO, for highly accurate, non-contact measurement of various tool parameters on cylindrical tools, which is now also available as an option for the HELITRONIC MICRO and HELITRONIC MINI PLUS tool grinding machines.

The machines also allow users to experience the pioneering C.O.R.E. technology. The advanced hardware and software architecture of C.O.R.E. creates the basis for a new generation of machine tools, with simple networking, intuitive operation like on a smartphone and the possibility to



use modern software applications directly on the machine.

United for your success

The group presents itself with the motto that is also its slogan: "UNITED FOR YOUR SUCCESS." This motto succinctly describes what UNITED GRINDING stands for: With its nine brands under one roof, the group is strong and it uses this strength to make its customers even more successful and has been doing so for 30 years. Thus, the group is not only celebrating product highlights at the trade show, but also a round birthday.

The UNITED GRINDING Group is looking forward to the personal conversations with its customers and the interested trade audience.

UNITED GRINDING Group is one of the world's leading manufacturers of grinding, eroding, laser and measuring machines as well as machine tools for additive manufacturing. With roughly 2,500 employees at more than 20 manufacturing, service and sales locations, the Group is organised in a customer-oriented and efficient way.

Through its MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER, EWAG, and IRPD brands, as well as competence centres in America and Asia, UNITED GRINDING offers broad application expertise, a large product portfolio and a full range of services for the production of high-precision components.

UNITED GRINDING Group
Tel: 0041 313 560 128
<https://www.grinding.ch/en/>

Hall 11 – Stand E34





Details make Perfection and perfection is not a detail

(Leonardo da Vinci)



It is a principle that we have been applying to all our grinding machines for over 100 years. We design customized centerless grinding solutions that stand out for their innovation and great attention to details. We always guarantee grinding processes to the "micron", and perfection is not a detail.



GHIRINGHELLI
Centerless Solutions

Rettificatrici Ghiringhelli S.p.A.

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Follow us on:



Hall 11
Booth E37

Perfecting high-mix CNC production with Fastems Intelligent Automation

The ever-growing complexity and change around industrial manufacturing needs intelligent automation that enables resilient and efficient high-mix production. Come to meet Fastems in EMO Hanover to hear the latest news, releases and insight that is relevant to both OEM and contract manufacturers

Flexible Pallet Tower for 4- and 5-axis CNC machines

To enable lights-out manufacturing and high spindle utilisation in high-mix production with 4 and 5 axis milling and mill-turn machines, including vertical 5-axis machines, Fastems launched its Flexible Pallet Tower (FPT) in 2022. This year Fastems is releasing and showcasing a new larger version for 1,000 kg payloads and 500-630 mm pallets. With an extremely compact footprint of just 19 sq m, FPT-1000 can accommodate 12 to 24 machining pallets of two different heights and enable order-based production with a single CNC. Fastems welcomes EMO visitors to see the system live at its stand.

Modular Flexible Pallet System for 4- and 5-axis milling machines fits for any shopfloor

Fastems is excited to announce the launch of a multi-machine version of the above-listed FPT - Flexible Pallet System (FPS). FPS is a modular solution with a unique 360-degree design. Compared to typical flexible manufacturing system, FPS allows customers to place machine tools, pallet storage units and operator loading stations flexibly utilising all the four sides of the system. With the same maximum height of only 3.1-3.8 metres like FPT, FPS is a perfect fit for also low-ceiling facilities. FPS offers the full FMS benefits for producing high mix with minimum production setup times and maximum spindle utilisation. Like all Fastems systems, FPS can integrate CNCs of over 90 different brands and be later extended or upgraded if the production needs change.

Auto-Loading Cell maximises unmanned FMS production capacity

The Auto-Loading Cell (ALD) ensures that Fastems FMS runs unmanned around the clock, even when the pallet demand is extremely high. The robot cell loads and unloads the parts to and from the pallets automatically as well as re-clamps parts between machining operations. In addition to making sure the FMS never stops during nights and weekends, ALD can reduce the pallet and fixture need significantly, saving both money and space. Fastems live robot showcase at EMO demonstrates the principles of autoloading functionality, including clamping the part in different operations, into conventional clamping fixtures that are more affordable option compared to hydraulic or pneumatic fixtures.

myFastems

Visitors to the Fastems booth will be able to learn about myFastems. Offered as Software-as-a-Service (SaaS) product, as part of Fastems' automation solutions, myFastems provides powerful tools to help customers keep their Fastems systems up and running around the clock, for maximum availability and productivity. The digital service is available as a web progressive application and easily accessible via mobiles, tablets, or laptops, providing transparency to all Fastems systems: service history,



spare parts usage, and comprehensive system overview for connected systems, as well as alarm-based recovery instructions and support request tickets.

Factory Cockpit: Factory-wide transparency on central key figures

Last but not least, Fastems is presenting Factory Cockpit, a new solution that collects, integrates and analyses data from shop floor devices and IT systems. Factory Cockpit provides tools for real-time situational awareness and data-informed insights for part manufacturing, which help optimise the overall production flow and resource efficiency. With Factory Cockpit, real-time production statuses or important manufacturing KPIs such as OEE, utilisation and availability are easily available for all selected stakeholders, both internally and externally. From operators in the shop floor, to production managers, business managers and customers, the seamless information flow increases transparency and enhances collaboration throughout the whole production process, enabling manufacturing companies to lead and develop their manufacturing with data.

The offering includes consulting services in the material handling environment through to flexible manufacturing systems, robot-based automation solutions, software for production control and a comprehensive range of services. With these solutions it is possible to increase the capacity of machine tools and additionally optimise processes. With the help of the intelligent MMS software, production and tool management are efficiently planned, forecast, controlled, visualised and monitored.

Interested to learn more? Contact:

Philip Cattaneo, sales manager

Tel: 07707 912342

Email: philip.cattaneo@fastems.com

www.fastems.com

Hall 12 - Stand D67

STUDER presents innovation at EMO

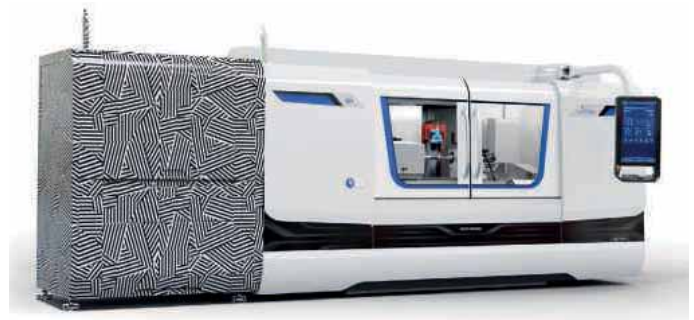
In Hannover, STUDER will present a new automation solution on its joint stand with the UNITED GRINDING Group.

Fritz Studer AG, one of the market and technology leaders in universal, external, internal cylindrical, and non-circular grinding, will present a new automation solution on the S31 universal external cylindrical grinding machine at EMO. In addition, visitors can look forward to other machines on display:

- **favorit** - The price hit for the most important applications.
- **S33 with uniLoad** - The value for money for individual requirements.
- **S100** - The ergonomic machine for the entry-level segment.
- **S131R with roboLoad** - The expert for every conceivable internal grinding task.

The customer-oriented REvolution continues

With the first-time presentation of C.O.R.E. at EMO 2021 in Milan, the UNITED GRINDING Group has triggered a revolution in the field of machine tools. The advanced hardware and software architecture on which C.O.R.E. is based enables a novel machine interaction concept. But C.O.R.E. is much more than just a revolutionary operating system. It opens up new possibilities for networking, controlling, and monitoring the production process and thus for process optimisation. It also lays the foundation for the operation of modern IoT applications and thus opens the door to the digital future.



Since 1912, the name STUDER has stood for Swiss hardware, software, system integration, and service at the highest level. With a tailor-made complete solution for every grinding task, the customer also receives knowledge and expertise in all aspects of the grinding process. For decades, the STUDER logo has been recognised worldwide as a seal of quality for first-class results. The company ensures that "The Art of Grinding" will remain closely associated with its name in the future. STUDER has over 110 years of experience in the development and manufacture of precision cylindrical grinding machines.

Fritz Studer AG Tel: 0041 334 39 1279

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Hall 11 - Stand E34

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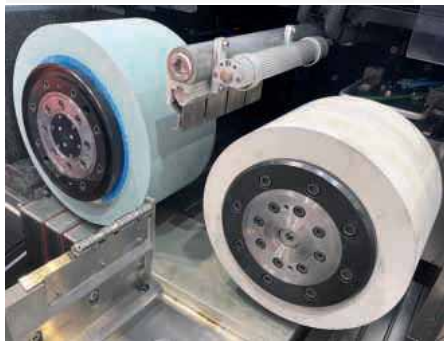


Learn more at fastems.com/fps

Advanced Grinding Solutions at EMO

Seven of Advanced Grinding Solutions principals are exhibiting at the forthcoming EMO exhibition including Rollomatic, Gerber, Meccanica Nova, Comat, FLP Microfinishing and GPA Innova

TSCHUDIN will present an innovative product portfolio at EMO; both the award-winning CUBE 350 with a robot loader and the ecoLine 400 will be on display. Iwan von Rotz, CEO of TSCHUDIN, explains: "Our customers grind workpieces of the most diverse sizes on our machines: from the smallest wires for medical technology to tapered roller bearings weighing up to 11 kg that are used in large-diameter bearings in wind turbines." The CUBE 350 is designed for machining small workpieces up to 20 mm in diameter. The 400 ecoLine/proLine is suitable for machining medium-sized workpieces up to



150 mm in diameter, and the 600 ecoLine/proLine can machine workpieces up to 250 mm in diameter. The maximum grinding wheel width is 500 mm.

The Cube uses Tschudins patented W-axis which has the workrest blade mounted onto its own CNC axis that allows for parts to be loaded to it outside of the grinding area making loading efficient, fast, and very safe. Traditional centreless grinding machines require parts to be loaded to a fixed work-rest blade that sits inside of the machine between the grinding wheel and control wheel making loading difficult, more expensive, and sometimes unsafe. This also makes changeovers more

complex and therefore lengthier. The Tschudin machine overcomes all of these issues and claims to be the world's easiest and fastest centreless grinding machine to set-up. The centreless cylindrical grinding machines from TSCHUDIN are used in all industries where mechanical components are required with high accuracy and at economical unit costs – from medical technology and the bearing industry to hydraulics, automotive engineering, drive technology, toolmaking, and aerospace. The materials machined, such as steel, aluminum, glass, titanium, carbon, ceramics, or silicon, are just as versatile as the areas of application.

Gerber will be launching its latest deburring machine on its stand: the BP Motion. This machine is the ultimate solution for deburring, edge honing and polishing. It offers unparalleled flexibility, dynamic performance and digital capabilities. This innovative machine has been designed to remove sharp edges and burrs, brush defined radii and contours on edges and to polish surfaces to the highest levels. With its extended speed range of up to 1,000 rpm, the BP Motion delivers deburring results in record time. The BP Motion also incorporates cutting-edge features such as even more precise automatic brush measurement and automatic compensation for brush wear to ensure maximum process reliability.

For producing small, medium, or large batches of parts the BP Motion is the perfect choice. With a variety of applications for flat and slightly curved parts, this machine offers incredible versatility. Thanks to its Industry 4.0 connectivity and preparation for fully integrated automation, it also provides the highest level of productivity.

One main application for the Gerber machines is the edge preparation, deburring and polishing of all types of cutting tool inserts and Gerber is able to list worldwide industry leading clients such as Plansee-Tizit, Sandvik, P.Horn, Sumitomo, Iscar and Kennametal amongst its many end users. Apart from insert production, Gerber machines are also used in the medical industry and for the manufacture of valve plates, pump components and rotors



etc. whereby parts need to be deburred with edge forms being controlled.

Nova manufactures flexible CNC grinding machines that feature excellent accessibility for quick change-over, serviceability and maximum up-time while providing the rigidity required for the most demanding of grinding applications. The range comprises of internal, external, combined and special grinding machines for the bearing and constant velocity joint industries.

Nova internal grinders are used to make small parts, such as bearings, valve lifters and giant parts such as landing gear struts. Three workholding systems are available; roller/shoe type, magnetic/shoe type and chucking with front loader or through the spindle. Tooling costs are low and change-over is rapid. The bearing industry typically uses the magnetic/shoe system. Parts must be made from magnetic steel and have a ground OD and face. When the part has a ground OD the roller/shoe system is used. Chucking systems are available when the parts do not have ground external surfaces and external grinding is critical to many manufacturing organisations. The performance of parts such as bearings and CV joints are directly tied to how well they are ground. At the same time external grinding is a bottleneck for most manufactures. The Nova PGE series of external grinders are built to achieve roundness of less than 0.0005 mm with cycle times as short as a few seconds. Dressing systems are available to shape the wheel for roller bearing tracks, ball bearing grooves and C-V Joint cage OD's.

Comat will be displaying its super-filtration systems that deliver $\leq 2\text{-}3\text{ }\mu\text{m}$ filtration quality, making oil cleaner than unused oil as supplied new and importantly do so throughout the entire working cycle while minimising lifetime running costs and maintaining maximum coolant consistency. Importantly for end users, the Comat filter systems use their Intelligent Performance Technology that allows them to be remotely monitored in real-time during the manufacturing processes with customers' filter systems fine-tuned by Comat to ensure that the optimum filtration quality is obtained at all times. Furthermore, depending upon the model, the Comat filter units can be monitored, controlled and optimised by integrated controls or externally by PCs, tablets or smart phones. Today, more than 20,000 machine-tools use Comat Filtration Systems with more than 120,000,000 litres of metal working oil being super-filtered every single day. Comat operates globally and has a 30-year history in developing the most advanced filtration systems that are available. Comat's superfiltration technology uses continuously regenerating filtering media, diatomaceous earth, cellulose or

other vegetable media, to ensure that particles larger than $\leq 2\text{-}3\text{ }\mu\text{m}$ are removed from cutting fluids and the fluid is maintained at a stable desired fixed temperature of ± 0.2 degrees. Main applications for these filter systems include tool grinding on Rollomatic and similar grinding machines and also on turning machines and automatic lathes. Comat systems can operate with any oil having a viscosity ranging between five and 30 Cst at 40°C (104°F).

The latest generation of FLP machines will be exhibited at EMO. FLP Microfinishing is the only company in Germany to offer the entire range of industrial fine grinding, lapping and polishing machines for flat surface finishing from a single source. The four FLP product lines are: new single and double-sided machines, both standard and full CNC, fully rebuilt and refurbished machines, the supply of lapping consumables and tooling and a large subcontract lapping facility. The broad range of FLP fine grinding and lapping machines includes both twin wheel, double sided CNC lapping machines as well as single wheel machines. Around 25 percent of FLPs sales are for fine grinding machines that offer 2-3

times the stock removal of more traditional lapping machines. 75 percent of sales are for lapping machines that are used where there is a low stock removal requirement with a mirror finish and perfect flatness.

The revolutionary DLYte polishing machines produced by GPA Innova benefit from utilising the world's first dry electro polishing process. The DLYte range of machines use a totally unique, single step automated process, for polishing metals. This is a revolutionary dry non-abrasive electro polishing process that does not use any liquid as the electrolyte. These new patented machines polish and deburr steel and stainless-steel, cobalt chrome, titanium, aluminium, nickel and precious metal alloys components for the dental, medical, aerospace, automotive and other industries.

AGS will be present throughout the EMO to welcome engineers to their principals' stands and further information can be seen on its website:

www.advancedgrindingsolutions.co.uk

UK Agent

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Tel: 024 76 22 6611

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EMO HANNOVER
18-23/09/2023
Hall 11
Booth E06

KAPP NILES
precision for motion

RK International Machine Tools unveils impressive partner lineup of 15 cutting-edge machines

RK International Machine Tools, a leader in the UK marketplace for supplying and supporting grinding and thread-rolling machine tools, will be participating at EMO. The company is set to showcase an exceptional lineup of 15 state-of-the-art machines at this highly anticipated event working alongside its established machine tool partner network.

Director and general manager Simon Rood, says: "As a trusted provider of innovative solutions for precision engineering, RK International Machine Tools continues to push the boundaries of technological advancements. With EMO 2023 as the perfect platform, the company is aiming to captivate attendees with its cutting-edge equipment designed to elevate manufacturing processes to new heights and machining productivity."

The 15 machines to be unveiled at RK International Machine Tools partner's exhibition booths offer an extensive range of capabilities, catering to various industry and business sector requirements. From large-scale industrial operations to small-scale precision engineering, these machines are poised to revolutionise how high-precision grinding is approached.

All the machines are based in **Hall 11** and among the highlights of the RK International Machine Tools lineup are:

- The new Robbi Omicron CNC3206 universal grinding machine on **Stand B64** will feature the new Siemens Sinumerik ONE control, which provides next-level CNC boosting productivity with its ability to deliver up to ten times faster PLC cycle time than its predecessor. Robbi, one of Europe's most extensive grinding and honing machine manufacturers, produces cylindrical grinding machines up to 1,000 mm swing x 8,000 mm grinding length.

- Surface grinding specialist, Delta S.r.l., will show the compact MINI 7 surface grinder and Rotax 7 surface grinder with a rotary table. Both machines include hydrostatic axes travel and hydrodynamic spindle. The popular Delta LC400, with its vertical spindle and rotary table, will also be on **Stand B66**.



- Continuing with its Italian machine tool partners, on **Stand C63**, Melchiorre will be exhibiting the highly precise ELC900 double sided fine grinding machine. This model features 6-part carriers with a capacity of 254 mm per carrier.

- Jainnher, a partner RK has enjoyed a 30-year-plus relationship, will be showing the compact JHP-2003CNC plunge type grinding machine. Featuring a FANUC Oi-TF CNC control, this compact cylindrical grinder has a 200 mm dia swing over the bed x 300 mm grinding length capacity and is a fully enclosed machine. Jainnher can be visited on **Stand C56**.



- On **Stand B49**, Perfect will show the latest DT touchscreen control on both a rotary table and reciprocating table surface grinders. The 300 x 600 mm Perfect PFG-3060DT and PFG-R400DT highlight how today, we all appreciate touchscreen control and, along with automatic down feed and complete machine enclosures, today's



machines are safer and more productive than ever.

- Achieving up to 20 percent stronger thread forms and increased tensile and shear strength, the MEGA TR-18T thread rolling machine will be on **Stand E53**. The TR-18T has a 60 mm maximum component diameter and, subject to application, can thread roll for 0.6 to 4.0 mm pitch threads. Starting with five tonne rolling pressure, MEGA supplies machines up to 200 tonnes.

"RK has a very established partner network," adds Simon Rood. "Due to the nature and applications, we discuss with manufacturers and we are pleased to be working alongside several new partners to fulfil missing capabilities in our portfolio." These new partners include:

- Established for over 70 years, e-tech Machinery will show the new Multi ID & OD EGM-350T hybrid CNC grinding machine on stand B52. This exciting new machine is a horizontal spindle grinding machine and features an ATC that allows between 6-8 grinding wheels to be changed in-cycle utilising a BBT30 spindle. The EGM-350T has a 400 mm dia OD x 300 mm ID grinding capacity of up to 260 mm in length.
- Joen-Lih Machinery will be highlighting the JL-52-LM-CNC profile grinding machine on stand A33. The 300 x 200 mm grinding capacity is ball screw controlled for the vertical and cross. However, longitudinal travel is controlled by a linear motor and allows exceptional positioning accuracy and increased precision.
- Dowell Machines will be unveiling on stand A22 its new HR-600PLUS high precision rotary grinding machine featuring a 600 mm dia table and its advanced DSG-2032ANDII 3-axis ballscrew driven, PLC surface grinder with 800 x 500 mm grinding capacity.

These machines represent just a glimpse of the grinding-edge technology that RK International Machine Tools will show via its supplier network at EMO 2023 in September.

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Danobat redefines precision and flexibility at EMO

Danobat, a leading provider of machining solutions, is set to showcase its precision and flexibility at the upcoming EMO exhibition. With a reputation for excellence and innovation, the company continues to redefine industry standards and meet the evolving needs of its customers.

Under the slogan: "Precision and Flexibility Redefined," Danobat remains committed to delivering exceptional quality and adaptability. Precision is a cornerstone of its solutions, differentiating its customers from competitors and ensuring unparalleled accuracy. Moreover, flexibility is deeply ingrained in the company's organisational DNA, enabling it to proactively respond to market dynamics and provide tailored solutions to meet unique challenges and requirements.

Flexibility is not only deeply ingrained in its organisational DNA but also a key characteristic of Danobat machines and solutions. This is achieved through various means, including modular design, advanced controls and software, versatile machining capabilities, integration with automation systems and readiness for fast

changeovers. Sustainability is also a priority, with energy-efficient technologies, reduced emissions, and eco-friendly materials incorporated into Danobat's machines.

Highlighted among the exhibited solutions are Danobat's range of grinding and hard turning machines, designed with a focus on precision, flexibility, and sustainability. The VG-1000, a hybrid machine, combines grinding, hard turning, milling, boring, and drilling in a single setup, satisfying tight tolerances. The CG-1000, a compact grinding machine, offers advanced technologies and robust construction for excellent surface finishes and high production.

Other exhibited solutions include the Estarta-250, renowned for its precision in centreless grinding operations and the MikroTurnGrind-100, developed by the

Dutch subsidiary Hembrug, which combines turning and grinding capabilities for complex machining tasks. Additionally, the German subsidiary, Overbeck, will

showcase the IRD-400, a versatile all-rounder that performs multiple processes with the highest precision.

"Our goal is to empower our customers with the most efficient machines that drive productivity and foster growth," says Danel Epelde, business development director at Danobat. "By embracing flexibility at our core and incorporating precision into our solutions, we offer cutting-edge technology that optimises operations and keeps our customers ahead in a competitive industry."

Danobat

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www.danobat.com

Hall 11 – Stand E38



Got a Challenge?

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Hall 11
Stand E38

Ghiringhelli exhibits its latest products at the EMO 2023

by Claudio Tacchella

The Italian company Rettificatrici Ghiringhelli S.p.A., headquartered in Luino (VA), has been developing centreless grinding solutions for over a century with a constantly renewed and customisable range of machines, automation and flexible modular systems. The company will attend the international EMO exhibition in Hannover where its latest products will be on show. In particular, the high precision A80 centreless grinding machine with fixed centre equipped with the new CNC FANUC Oi-F Plus. This implementation widens the choice of CNC solutions on the A80 range able to satisfy different production and market needs.

"The A80 line is highly appreciated in the market segment for the grinding of pieces with extremely small dimensions," says Patrizia Ghiringhelli, joint managing director of Rettificatrici Ghiringhelli. "Two years ago we launched the A80 line with the aim of satisfying the specific needs of this segment and the new business

opportunities we immediately obtained, drove us to combine the consolidated Siemens proposal in the CNC field, available on our entire range of products, with a similar FANUC proposal as well. This allows us to widen the choice of the CNC, thus providing the required solutions and increasing our market share. The implementation of the FANUC system on the A80 line, developed in no time by our engineers, confirms our strategy of further enhancing the supply of our centreless grinding machines, which are characterised by high technology, accuracy, quality and reliability."

The new FANUC Oi-F Plus numerical control is equipped with a 15" Touch-Screen display housed on an ergonomic console that can be adjusted by the operator. Thanks to the Ghiringhelli owned HMI interface, the user environment has been designed to be easy and intuitive in order to guarantee the best user experience. There are dedicated icons, high visibility design and animated



All software functions, automation included, are integrated with those of the machine through the exclusive HMI software platform owned by Ghiringhelli

functions that simplify all the operations, even the most complicated ones, for setup, programming, execution of rapid grinding cycles, advanced diagnostics, remote control, telediagnosis, preventive periodic maintenance and still many others. The new A80 centreless grinding machine can be easily integrated with the most common production management devices thanks to the particularly reliable and tested OPC UA open protocol, developed by the OPC Foundation. In general, the new A80 centreless grinding machine with fixed centre has six CNC axes on a natural granite base. The grinding wheel head has wheels of $\varnothing 200$ mm x L 80 mm, power of 4 kW, operating at a constant peripheral speed up to 50 m/s, 63 m/s as an option. The control wheel head has wheels of $\varnothing 100$ mm x L 80 mm. The control wheel head can be tilted by $\pm 5^\circ$. The machine can grind pieces from $\varnothing 0,3$ mm up to $\varnothing 10$ mm for lengths up to 80 mm, both plunge and through feed.

Ghiringhelli will exhibit a centreless grinding machine, APG-S line at high cutting speed, which features an interesting technological innovation. The main machine working axes are equipped with smart ball screws thanks to the application of the new



The Ghiringhelli's A80 centreless grinding machine with fixed centre is equipped with the new CNC FANUC Oi-F Plus



The APG-S centreless grinding machine is equipped with the new Hiwin i4.0BS system, designed for the predictive maintenance about the state of the axes ball screws

Hiwin i4.0BS system, an innovative Edge Computing solution designed for the predictive maintenance about the status of the axes ball screws. This machine integration represents an important step forward in the field of Industry 4.0, being the first ball screw in the world suitable for the integration into the "Smart-Factory". The system consists of an Edge Computing Module (ECM) and patented multifunction sensors mounted on each ball screw. This integration, thanks to advanced algorithms, can identify the right time to lubricate the axes, to monitor vibration and temperature anomalies, as well as to analyse, recognise and signal the natural decay of the preload level of the ball screws before an unwanted state of play occurs. This system maintains the initial stiffness performance of the axes ball screws and adds to the numerous Ghiringhelli functions already integrated into the CNC, thus improving the efficiency of predictive maintenance services.

Ghiringhelli has always paid great attention to providing cutting-edge solutions for diagnostics, ordinary and predictive maintenance for the users of our grinding machines," explains Patrizia Ghiringhelli. "Thanks to the application of this innovative Hiwin i4.0BS system, the ball screws on the main working axes of our

i4.0BS



Through advanced algorithms, the Hiwin i4.0BS system processes in real time several measurements and analyses of critical parameters on the conditions of the axes ball screws

APG-S become smart, thus offering improvements in terms of efficiency, accuracy and reliability. This integration adds to the numerous Ghiringhelli technical assistance solutions already integrated into the CNC of our machines, thus bringing numerous benefits to our customers thanks to optimised maintenance and increased productivity. Our dedication to quality and innovation drives us to pursue technological excellence in the grinding machine industry. We will continue to work tirelessly to

ensure the highest customer satisfaction and remain a benchmark in the market."

The technical features of the APG-S range at high cutting speed include: the mineral casting frame, the ability to grind pieces from $\varnothing 1,5$ to 70 mm, the electro-spindle on the CBN grinding wheel of $\varnothing 610 \times L 20$ mm and the motor power of 55 kW for peripheral speed up to 120 m/s. Control wheel $\varnothing 305$ mm with torque is up to 11 Nm with CNC native digital Siemens Sinumerik-ONE, Ghiringhelli's HMI interface, "multi-touch" screen on adjustable console, integration of the Siemens "Safety Integrated Plus" module, Siemens IO-Link communication protocol and numerous available solutions for diagnostics, remote service assistance, also through AI-Artificial Intelligence in Augmented Reality-AR technologies. Both the A80 centreless grinding machine and the APG-S have a wide range of piece loading and unloading automatic systems as well as accessories and optional devices for the highest customisation of the system.

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Hall 11 - Stand E37

For landing gear, grinding and turning in a single AZ machine solution

by Claudio Tacchella

With over 40 years of experience, Italian company AZ Spa from Thiene (VI) is a leading player in the aerospace sector, providing high-quality solutions to direct and indirect aircraft manufacturers, EOM and MRO industries. Specialising in designing and building a wide range of highly customisable grinding solutions, all fully Industry 4.0 compliant, known as AZ-Aerospace, the company caters to the production, maintenance, repair and overhaul of numerous aeronautical components.

The innovative solutions on its machines range from the versatile RUA, RUX, RU, and RUG series for universal external and internal grinding, to more specific grinders like the AKP series for gap bed grinding of landing gears, the GSB series for internal grinding of landing gears and the LBC series for orbital grinding of landing gears, handling both external and internal diameters or heavy asymmetric parts on a rotating table.

A recent supply, destined for a major player in the MRO sector, holds significant technological importance. "The client," states Sarah Pizzolato, marketing director of AZ SpA, "had the need to boost their



The internal grinding of deep holes on landing gears is carried out using special electro-spindles equipped with various interchangeable extensions

production with a highly flexible machine to meet the rising demands for processing various types of landing gears, especially those designed for Boeing 767-777 MLG aircraft equipped with heavy asymmetric landing gears, requiring all interior operations. We're talking about deep holes and the client requested to combine both

grinding and internal turning operations in a single machine solution. In collaboration with the client and leveraging our numerous modularly designed solutions, we efficiently tackled the challenge of the required deep holes, developing a customised solution with the CNC GSB1900 grinding machine, which represents a dedicated line of machines precisely tailored for interior machining of large-sized landing gears. The machine performs internal grinding of landing gears using a special electro-spindle, which can be equipped with various interchangeable extensions of different lengths and technical characteristics, depending on the workpiece to be ground. CBN or Corundum grinding wheels are mounted on these extensions and are profiled using two diamond dressers installed on a dedicated diamond dressing turret, one with a diamond roller for CBN wheels and the other with fixed-point diamonds for Corundum wheels. For internal turning of diameters, the machine is equipped with a turning head featuring two boring bars where various interchangeable tools are mounted, depending on the material to be removed, along with their respective cooling nozzles.



The GSB1900 grinding machine combines both internal grinding and turning operations for heavy asymmetric landing gears in a single machine solution

The turning head can be tilted by $\pm 1.5^\circ$ to correct any taper and is fixed on the grinding head carriage located beside the grinding electro-spindle. On the diamond dressing turret, a 3-point probe is also installed to control the length and diameter of the turning tool. Additionally, a special chip collection and evacuation tank is installed on the table for collecting and removing the turning chips."

During internal grinding, the workpiece is clamped at one end using a self-centring chuck mounted on the workpiece headstock and supported at the other end by a steady rest. The workpiece headstock and steady rests are mounted on a table with a vertical pin functioning as a pivot, allowing the table to rotate and vary the angle of the workpiece axis relative to the Z-axis of the machine. The steady rests and headstock can be easily positioned based on the length of the workpiece being processed.

Moreover, the positioning of the workpiece headstock along the table is controlled by CNC using a rack-and-pinion system and facilitated by a pneumatic lightening system for easy movement. The closed steady rests, equipped with lubrication points for greasing the three supporting pads, also feature pneumatic lightening for effortless manual handling. An Idrofono is installed on the steady rest to monitor the grinding wheel-workpiece contact. The rotational movement of the table on the base plane is controlled by CNC with pneumatic lightening.

The machine is built on a Composital



On GSB1900 the turning head is fixed on the grinding head carriage located beside the grinding electro-spindle

base, a special material composed of resin-granite and steel, ensuring high rigidity and vibration dampening. It features seven basic CNC axes. The transverse X-axis approaches the grinding carriage to the workpiece, the longitudinal Z-axis moves the grinding carriage along the workpiece axis, the C1-axis rotates the self-centring chuck, and the S3-axis controls the internal grinding spindle in the grinding wheel turret. The X, Z, and C axes are driven by synchronous motors, while the internal grinding spindle is operated by an electro-spindle.



The AZ AKP range with gap bed allows external grinding of landing gears

Additionally, the machine is equipped with a U1-axis for table rotation, a W1-axis for the movement of the steady rest along the table, and an S7-axis for rotating the diamond roller used for dressing CBN grinding wheels.

In this configuration, the supplied GSB1900 grinding machine offers remarkable working capacity with a maximum rotating diameter on the table of 1,900 mm, enabling a maximum internal grinding depth of 2,000 mm and a maximum internal turning depth of 1,900 mm. The diameter of the self-centring chuck platform is 1,250 mm, combined with a total clamping force of 12,500 daN, allowing for a maximum workpiece weight of 4,000 kg with the steady rest. The internal grinding spindle unit can accommodate grinding wheels with a maximum diameter of 250 mm, mounted on a 20 kW electro-spindle, with a motor torque of 39 Nm, capable of reaching speeds up to 5,000 rpm.

AZ Spa will be exhibiting at the international EMO fair in Hannover in **Hall 11 - Stand D39** where its engineers are available to explain all the technical features and provide information on the new AZ-Aerospace range.

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The AZ LBC range performs orbital grinding on the outer and inner diameters of heavy asymmetric landing gears on a rotating table, without moving the workpiece

Improving productivity of compressor blade surface finishing

Advances in CNC machining continue to transform the tolerances of component surfaces. Aerospace component manufacturers play a pivotal role in driving these advancements. Yet legacy processes for surface finishing of compressor blades, blisks and disks often includes using hand power tools.

The need for precision and uniformity in blade profiles is paramount. This is especially important on the leading and trailing edges. Here, edge rounding enhances strength, integrity and performance. Achieving consistent material removal along a blade profile is a challenge.

Even experienced hand finishers struggle to meet the stringent tolerances demanded by manufacturers. The limitations of hand finishing, coupled with problems in finding and training skilled finishers, can lead to costly production bottleneck.

Replacing hand finishing with robotic deburring and rounding using grinding wheels and brushes does help. This too has its limitations. Sharp edges can slice through brush tips leading to surface variation and contamination. Grinding wheels tend to remove material unevenly and robot movements have to compensate for this. Trying to fine-tune for difficult to reach surfaces causes more inconsistency and rejects.

High precision stream finishing

Aerospace manufacturers have shared their challenges with Fintek. The company has extensive expertise in surface engineering. Much of this comes from working with component manufacturers for F1 teams. Advanced surface finishing expertise is vital to the rapid development cycles of components for F1 cars.

Fintek has responded to aerospace component makers by working with OTEC Präzisionsfinish GmbH. Using OTEC's advanced stream finishing systems, Fintek enhance the efficiency and precision of component surfaces.

Automated stream finishing systems have brought about a game-changing shift. For example, Fintek has developed a process that combines smoothing the blade body and rounding the edges in a single



stream finishing operation. Blades are secured in the SF machine and immersed in abrasive media. Rotation of the container and blade movement in the media flow are finely controlled. Combined with timed changes in blade angle, targeted and precise surface smoothing and edge rounding results. Importantly, this happens without removing excessive material and altering the blade profile.

The benefits of this process include ultrashort processing times compared to conventional methods. Fintek, have reduced blade finishing times from around 50 minutes to as little as three minutes per blade. This advancement has not only accelerated the process but has also eliminated the need for three previous CNC operations. Meaningful time and cost savings indeed.

Conventional finishing methods may make target tolerances, given enough time. Too often it doesn't do this consistently around the entire blade profile. Whereas, stream finishing achieves closer to target surface tolerances. It does so more quickly and with greater consistency around the blade profile. Doing this for every blade processed without tiring.

Stream finishing minimises the risk of component damage during processing. The entire operation takes place within a single



machine, reducing handling time. For example, OTEC's SF5 processes up to five compressor blades at the same time. This ensures high output and efficiency. Also, it is effective in removing machining lines and residual stresses, further enhancing the durability of the blades.

Stream finishing has proven to be an ideal surface preparation method for applying ultra-hard coatings. These are often required in aerospace applications to improve component wear resistance. The integrity of such coatings is greatly enhanced by better surface finishing pre-coating. After hard coating, a further surface finishing cycle can remove any residual coating droplets. These droplets could disrupt moving parts designed with

tight tolerances if they detach during engine operation.

Subcontract service or machine?

Fintek are certified to ISO9001 and AS9100. It offers comprehensive subcontract services to aerospace component manufacturers. An experienced team advises on the ideal process to achieve the best commercial finish. Within its subcontract services, Fintek uses OTEC surface finishing machines extensively.

Fintek also sells, installs and supports the

full range of OTEC Präzisionsfinish machines, as its exclusive UK agent. These machines are ideal for the inline production surface finishing needs of aerospace component manufacturers. Deburring, edge rounding, fine-grinding, smoothing and polishing often take place in one process. The machines also recondition used and worn cutting tools. In addition to subtractive engineered parts, they can process additively manufactured parts and components made using near-net-shape production.

Different machines in the OTEC range fulfil different tasks. For example, CF disc finishing machines are perfect for the cost-effective mass finishing of smaller fasteners. They excel at finishing small and very thin parts too. DF drag finishing machines process larger components without part-on-part contact. SF stream finishing machines give fine precision control of surface finishing of parts weighing up to 200 kg. They enable accurate targeting of particular surface areas.

Collaboration

"High-bypass turbofan aero-engine primes like Rolls-Royce, GE, and Safran are developing quieter, lighter and more fuel-efficient engines. Fintek is meeting the stringent component surface tolerances these demand, while enhancing productivity. Collaborative efforts between surface finishers and manufacturers are essential to address their superfinishing needs," concludes Jamie Phillips, Fintek's general manager.

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Precision parts washing for the aerospace industry

The aerospace industry is always at the forefront of technological advancements, constantly striving for more innovative materials and more effective manufacturing processes. However, given the nature of the application, safety is always an imperative, which also controls the way that processes evolve and the verification of materials that can be used. Every element of manufacturing must be consistently repeatable and auditable to give total confidence in the end result.

These same disciplines are required of the wash systems that operate as part of aerospace manufacturing processes, whether supporting the manufacture of engines, actuation systems, sensors, or simple fasteners.

MecWash Systems Ltd has worked with major aerospace customers across the globe to develop efficient bespoke parts washing processes and systems to drive the effectiveness and reliability of their cleaning operations. This experience is to understand the complexity of the challenge and the unique requirements of many applications, which may affect the process options and chemistry used. For example, some components could be damaged by ultrasonics, excessive pressure or poor fixturing. Others are incompatible with particular chemistries or temperatures, which may cause longer term reliability problems. But despite potential constraints, high cleanliness specifications must always be delivered.

MecWash appreciates that some applications require a long development process working in partnership with a manufacturer. For example, MecWash spent about two years working on one blade cleaning application from concept design, through prototyping, then numerous trials and supporting the internal approval process for the required process change, before building the final system. It is comfortable making the investment to develop relationships with key customers. Different aerospace applications can require a variety of different wash solutions.

MecWash has designed and built systems to wash a wide range of the most challenging components with complex geometries or with tenacious contamination including high and medium pressure blades at various stages of manufacture, bearing housings, NGVs, heat exchangers and heat shields. In addition to its more standard

systems, two were developed specifically for engine components.

The SuperMaxi is the largest parts washing machine made by MecWash and can clean components such as bearing housings, blisks and intercases. The system includes its unique direct jetting technique, where the component is held in a rotating fixture with nozzles built into it, that continuously flush out critical features, blind holes or oil ways as the component rotates. Along with the flood and spray wash and rinse stages, this dedicated jetting provides powerful cleaning and highly focussed contaminant removal for engine components.

A second tailor made system is the BladeWash, created to address the tough challenge of flushing the internal cooling channels of high-pressure turbine blades. This unique system was developed by working closely with a leading blade manufacturer. The system holds the blades firmly while high speed/volume flushing over and through the blades takes place.

MecWash clean a very broad range of actuation systems for aerospace customers, from hydraulic manifolds to gears. Applications range from control surfaces to undercarriage and brakes with customers including Goodrich and Meggitt.

The precise nature of these actuation systems demands very high cleanliness standards and MecWash's MWX400 system with flood washing, ultrasonics at 20 watts/litre and vacuum drying is typically used to remove the coolant, oil, and other contamination to hit tight cleanliness standards.

Sensors require very high specification cleaning, but often need a delicate touch to avoid potential harm. The MWX300 is a small footprint high specification system, that often fits well in the smaller production facilities for these high value components, while delivering the highest cleanliness standards.

MecWash has decades of experience of working with aerospace fastener manufacturers, including SPS Technologies, to build systems for the cleaning of high volumes of titanium, brass, and steel fasteners. A high volume, good quality and good value system is typically required for these components.

The MecWash Duo is the most used machine by customers manufacturing fasteners. Suitable for both large components and dense baskets of small parts, the flood wash, spray rinse and hot air dry gives a simple but consistent wash process for such parts.

As well as delivering the highest cleanliness standards, aerospace companies require precise process control. MecWash systems support this with its fully integrated communications architecture.

MecWash's rigorous approach to aerospace components always starts with the in-house laboratory. Components are tested for cleanliness. Contaminants and substrates are assessed with different processes and chemistries and numerous options can be examined before machine trials begin.

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Best with automation. The new Multigrind® Radical, the gamechanger for all tool grinders



Radically faster tool manufacturing

Things are happening in Trossingen, Germany. After the promising presentation of the Multigrind® Radical at the GrindingHub in Stuttgart last May, the high-tech tinkerers from the Black Forest are going one better. The gamechanger for all tool manufacturers is now also available with an ultra-compact, super-fast automation system.

Grinding & Surface Finishing magazine is curious. How has the market reacted to the new tool grinding machine? Is there any initial customer feedback? What can automation do and why do people in Trossingen talk about the best tool grinding machine in the world?

Thomas Bader, technology pioneer and managing director of Adelbert Haas GmbH, is visibly proud of the new compact tool grinding machine and was happy to answer our questions.



Mr Bader, the Multigrind® Radical set out to make tool grinding faster, easier and more flexible as well as more economical and precise. Have you been able to deliver on this promise and what do the first users have to say?

Thomas Bader: Faster, more precise, more flexible, more economical, etc. That's not what we were looking for when we designed the Multigrind Radical. With a new tool grinding machine from Trossingen, better performance values are a matter of course and therefore predictable.

We wanted nothing less than to revolutionise, transform and thus lead tool manufacturing into the future. Hence the name Multigrind Radical and the nickname "Gamechanger". With the perfect choreography of software and hardware, we succeeded perfectly.

The first Multigrind® Radical machines are now at customers' sites. What do they say about the Gamechanger?

The best compliment so far came from a customer from the Swabian Alb. He said: "Now I not only have a Porsche in front of my door, but also one in the production hall and the difference? The Multigrind Radical has more endurance and makes money." As an engineer, I am particularly happy about the

Porsche compliment. Of course, also under the aspect of "grinding more beautifully". All joking aside: we have received positive feedback across the board. Only the wish for fast and really uncomplicated automation was still unfulfilled. We have now added to this.



The new automation system grinds cutters, plates and drills as needed

How do you integrate powerful automation into such a compact machine?

Yes, that was the challenge. An outstanding feature of the Multigrind Radical is its extremely compact design. With a minimum footprint of around 2.7 sq m and a height of just over 2 m, it is ideal for the smallest of



hall environments. With integrated automation, the footprint increases to just 3.7 sq m.

In return, the customer gets a fully automated and super-fast production unit with built-in productivity enhancements that set new standards in manufacturing. Regardless of whether they are grinding straight rotary or plate moulds and it is also incredibly easy to handle. Remember, a Radical doesn't take breaks, it just gives the tool time to recover.

Why don't you tell us some specific performance data, Mr Bader?

We'd be happy to discuss the details in a one-on-one meeting, expert to expert. Besides, we don't want to completely unsettle our market participants, we just want to spur them on. The tool grinding industry is looking for change and we can clearly feel that in the interest shown in our new machine.

Can you provide some additional information for our readers?

Well, here are a few superlatives. We drastically reduce non-productive time. Due to the parallel tool and grinding wheel change, we save an enormous amount of time and manage this discipline in just a few seconds. Milling cutters, plates and drills are ground as required: in large quantities, or as a very small series from batch size 1 to 1,000 and here previously unrecognised potential is raised.

Assume that you produce 2,000 hours per year in single-shift operation. Then, with an average machining time of 4 minutes per cutter, you will produce 30,000 cutters per year in single-shift operation. If you manufacture in two shifts, you will produce 60,000 cutters and in three shifts 90,000 cutters.

The industry average for a tool grinding machine is 30 seconds for workpiece change and 15 seconds for tool change. A Multigrind Radical, on the other hand, requires eight seconds for the workpiece change and three seconds for the tool change.

If we now assume that the workpiece has to be changed once and the tool twice to produce a milling cutter, the Multigrind Radical saves 46 seconds in non-productive time. This results in a savings potential of around 77 percent compared to the industry average. At an hourly rate of €80, the Multigrind Radical saves €0.50 per workpiece change and €0.26 per tool change. That pays for itself immediately. In addition, the machine can be quickly integrated into production. This can be completed within a few hours, i.e. without any loss of time and without any major programming effort. Parameterisation, templates and ERP information are provided immediately by Multigrind Horizon Software. This means that no control is required and the Gamechanger is ready for production on the spot. All that's left to do is quickly feed in the parts via automation and off we go. This is definitely rock around the clock.

Rock around the clock? Are you referring to unmanned production?

With the Multigrind Radical, we want to push the boundaries, a tool grinding machine without limits. Thanks to its compact appearance, it is also perfect as a solo performer for a garage start-up.

The real purpose of the Multigrind Radical is to combine several tool grinding machines into a hyper-profitable production cluster. Imagine five or 10 Multigrind Radical's side by side, there's a lot going on. This makes flexible, fully automated, unmanned series production the production standard. Lights-out production, 24/7 or, as the Beatles sang so beautifully: "Eight Days A Week."

By decoupling operation and machine, this happens with maximum independence. The machine operator is mobile, can control several machines at the same time and is always up to date.

Why do people in Trossingen talk about the best tool grinding machine in the world?

Our claim was exactly that. We set out to design and then build the best tool grinding machine in the world with the Multigrind® Radical. Operated by powerful software that

regulates everything in the background and only serves to control everything in the foreground.

When, as in this case, aspiration and reality correspond, it's fair to call a spade a spade, isn't it? And anyone who knows Adelbert Haas knows that we only develop something new if we can fundamentally improve what already exists, otherwise we leave it alone. The time was ripe and we delivered. Ultimately, of course, it's our customers who decide. Only when they talk about the best tool grinding machine are we satisfied and continue to tinker with the next big thing.

What prompted Adelbert Haas to develop a tool grinding machine just now?

It's like always at Adelbert Haas, our customers challenge us and we then try to exceed their expectations. When it comes to tool grinding, this meets a very, very long tradition in our company. As early as 1938, the HS 1 tool grinding machine was presented at the industrial trade fair in Leipzig and repeatedly improved in the following centuries.

It is also interesting to note that, parallel to the development of the Multigrind® Radical, we have also been working intensively on our heritage brand. From our self-image, we have long since ceased to be a pure machine builder. Since 1990, our own software development has become an important driver for more performance, more precision and unrestrained solution competence. This is often underestimated and we wanted to change that.

The "Schleifmaschinen" in our previous company name Haas Schleifmaschinen limits us and we have long outgrown it as a software pioneer. This also became clear to us when designing the Multigrind Radical. We took up this challenge and gave our company a new name. Haas Schleifmaschinen became Adelbert Haas GmbH at the beginning of 2023. Looking back at our founder and pioneer Adelbert gives us this new perspective moving forward. Towards the future, the future of high-tech grinding.

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EMO: Hall 6 – Stand E24

HB is bearing the fruit of Kellenberger machines

Located in Honley, HB Bearings is celebrating its 50th year in business in style, investing in the latest Kellenberger grinding centres from DF Precision Machinery. The latest addition, a K100 grinding centre with a Wenger automation system has cleared a backlog of two months of work in just two weeks.

The company specialises in the manufacture of special and standard metric and imperial bearings that are hard to source. This can include precision radial bearings, deep groove ball bearings, cylindrical roller, angular contact, duplex as well as many other types of bearing and housing. Katrina Wood, product manager for Gamet bearings at HB Bearings says: "HB Bearing is a bearing manufacturing company that has been running for 50 years now, manufacturing bespoke bearings as well as a standard Gamet Bearings product range."

It has recently installed a Kellenberger K100 grinding centre that has been supplied by DF Precision. The machine has been installed with a fully automated Wenger loading system that has revolutionised the way HB Bearings manufactures

large-volume runs of taper bearings.

Looking at the application Katrina Wood says: "This part is a Super Precision taper roller and it goes in the Gamet taper roller bearings. These can be used as high load bearings and where customers require super precision, for example, headstock bearings"

"There are many operations that are included in making the complete bearing. In the early days of production, it was difficult to get a whole batch quantity out for the customer, but this machine has been revolutionary. It's had a massive impact on the roller side of the manufacturing at HB Bearing."

The Kellenberger K100 is a universal CNC OD/ID grinding machine for use across medium to large-scale universal grinding applications. The Swiss-Made KELLENBERGER K100 grinding machine supplied by DF Precision is highly configurable and offers a wealth of options to accommodate the widest range of universal grinding operations. It is the combination of flexibility along with a proven track record at HB Bearings that has kept the Huddersfield manufacturer buying

Kellenberger machines. HB Bearings specified the Kellenberger K100 with a Wenger WeStep 650 automation solution. The WeStep 650 is capable of loading shaft parts up to 650 mm long and up to 260 mm diameter, HB is optimising this capability to run components from 7 mm up to 38 mm diameter in high batch quantities, the parts are fed in pallets that are drawn in and processed by a chain conveyor. Pallets are indexed under the line gantry and when a pallet of parts has been processed, it is placed on the upper finished parts conveyor and removed at the operator's side.

Looking at this productivity, Katrina Wood adds: "This machine has speeded up the number of rollers we are making in a day. We were making around 90 rollers and this machine can do 400 to 500, depending on the size. If the size is smaller, we can do a bigger batch within a day. It's had a massive impact on the business. I don't have to worry about the rollers, the quantities or quality when I'm issuing jobs or when I'm thinking about the deliveries. This isn't a problem to me anymore."

Katrina Wood continues: "The machine has made life easier. I do the sales, but I also come down to issue all the jobs and expedite, this headache is now gone. Customers are approaching us and being confident in the fact that we can deliver big quantity batches. We're getting repeat orders, but it's not just a case of the quantity, it's the quality, it's the customer service. It's the whole rounded service that we give here at HB Bearings."

The company has placed its faith in DF Precision and the Kellenberger brand over the years, with more than 8 Kellenberger machines on the shop floor. The company has Kel-Vista machines, a machine over 22 years old and more. Commenting upon the 22-year-old machine, Darren Mawhinney from HB Bearings says: "The old machine is making the same parts as it was 20 years ago. We are still grinding bearings to an accuracy of around 5µm, if not better on these kinds of machines. On the job it's running on at the moment, it is running with a repeatability of 3 µm."

Another of the most recent purchases at



The K100 with a bearing between synchronised centre

HB Bearing was a Kellenberger K10. Alluding to this, Darren Mawhinney says: "We decided to buy this machine to complement the production of our Gamet Bearings standard products. This machine offered us the opportunity to streamline that side of production and we're finding the repeatability of this machine to be 1µm, it's fantastic. When the bearings are in operation, they are extremely quiet and this is because they are super precision bearings. They need to have a running accuracy of within half a micron. So, we needed a machine that's capable of producing this precision, quality and repeatability."

Attaining micron repeatability and micron run out on the bearings is a daily practice for HB Bearing. As Darren Mawhinney adds: "We produce these bearings from one-offs up to batches in the region of hundreds-off. On the Gamet side alone, it's a 25 mm bore up to 700 mm OD and on the HB bespoke bearings, we do a 6 mm bore up to 1 m OD.

The additional machine has just given us so much capacity. It lets us keep up with customer requirements. It is letting us get ahead of our customer requirements now, so we're building up good stock quantities, shorter lead times and again the accuracy of the parts. It is highly instrumental in our goal to get our components right first time."

With both CNC and manual grinding centres, HB Bearing uses its manual machine tools for F1 bearings, vintage vehicles, reverse engineering and bespoke



The Kellenberger K10 with a magnetic chuck grinding Gamet Bearing

bearings. As Darren Mawhinney continues: "This is why we keep the manual machine shop going. But for our production side, the CNCs are the correct way to go. They've moved our company forward so much over the last 20 years, especially with the new K10 and the K100, our production capability has increased considerably."

Adding his thoughts on the Kellenberger K100 with Wenger automation, Darren Mawhinney says: "We are manufacturing super precision taper rollers and we will do these in batches of 'tens of thousands'. They come back from heat treatment and then we finish grind them through the Wenger loading system and the K100 to a precision and repeatability of 1µm. It's our second automated loader, when we had seen what is available from Kellenberger and Wenger it was an obvious choice for us. We had to move forward and we had to make sure that we could deliver for our customers."

He concludes: "Kellenberger has been here for the last 20 years, so we're expecting the same again. Our shop floor operators are well used to the machines, the operating system, they all know their way around them so there's no reason for us to look elsewhere. Everybody's happy with the machines and the support we get and we've never been able to fault the support we've had. Kellenberger has been perfect for us."

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Wenger Weststep automation system feeding the Kellenberger

Metal finishing machinery range from Sparx Machine Tools

Sparx Machine Tools is a family run business located in Poole, Dorset. It is proud to be the UK supplier for brands such as Kuhlmeier and Baileigh, offering a good range of metal finishing machinery. Its range of quality used engineering and fabrication machinery are serviced and prepared by its own inhouse engineers before being made available for purchase. The team are also on hand to value any surplus equipment you may have, followed by its quick payment and professional collection service.

The company's fully trained and knowledgeable engineers are always on hand for any service or repair work you may require and happily serve all parts of the UK and all types of machinery.

It prides itself on offering a professional service to all customers. Machines can be run and demonstrated under power and Sparx Machine Tools welcomes all visitors to visit and inspect any machinery and discuss options available to you.

Who are Kuhlmeier?

Kuhlmeier is a German manufacturer of the very best belt grinding machines available and they alone can make your finishing department profitable. Whether your need is for stainless surface grinding for parts from small to large, steel parts paint prepping or finishing of stainless welded edges and corners, these incredibly reliable, versatile and high-performing belt sanders are the best available. They feature a variety of innovative technologies delivering remarkable efficiencies and consistent reliability in delivered quality.

The range of machines are available in manual, semi-manual or fully CNC, Kuhlmeier has it all for you.

For many years, the Kuhlmeier Twin Belt Sander established the standard for superbly finished stainless parts. With a Kuhlmeier you can blend in the welded edges with the part's surface in a totally elegant way. But also think ergonomics, time savings and flow optimisation. With a Kuhlmeier Sander, your operator finishes the parts faster and Kuhlmeier enables you to speed up your finishing process like no other.

Kuhlmeier ZBS



The flagship Kuhlmeier ZBS Twin Belt Grinding Machine is built for roughing and finishing on welded edges, corners and surfaces on flat and mid-size workpieces out of steel, stainless steel, and aluminum, i.e. doors, frames, cabinets, housings, hoods, furniture parts, frame parts in automotive and aircraft manufacturing, round bins, cylinders and heaters.

Features

- Two grinding belts for roughing and finishing
- Triangular configuration for excellent access and visibility of the working area
- Pneumatic belt tensioning with durable ball guides
- Adjustable grinding belt speeds
- Swivel grinding belts up to 90 degrees with perfect belt centring.
- Self-centring grinding belt
- Pneumatic actuators on belt covers.
- Smooth high-capacity prism rollers to table and contact pressure tool
- Enhanced safety with sliding grinding belt cover, emergency pull cord, belt tension sensor and interlocked doors and covers.

Kuhlmeier EBSC



The new Single-Belt Grinding Machine EBSC is the perfect inexpensive, compact machine for your long belt graining needs. The EBSC is perfect for customers with little space available, who must process small components but need to integrate a professional and ergonomic belt grinding for machining of welding seams and surfaces in their production.

With dimensions of 2,400 x 1,850 x 2,000 mm, the EBSC can easily be integrated into existing production structures or as a mobile machine with its stable base and forklift pick-up points, it can easily adapt to a dynamic production processes.

Many details of the ZBS grinders are used in this compact machine, so you can be assured of the proven and high-quality construction, as well as from the high-precision manufacturing Kuhlmeier quality brings.

Sparx Machine Tools

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Kuhlmeyer produce the very best belt grinding machines available on the market, and they alone can make your finishing department profitable by reducing processing time and giving a consistent finish.

Whether your need is for surface grinding, or finishing of welded edges and corners, these incredibly reliable, versatile, and high-performing belt sanders are the best available.

Kuhlmeyer is trusted by names like – Mazak, Rolls Royce, BMW, AGA Rangemaster, Bentley

ZBS – Twin Belt Grinding and finishing

- 2m, 3m, 4m and 5m bed widths available
- Extremely versatile from graining/grinding flat parts to complex formed components.
- Up to 50% savings on work time due to twin belt operation
- Handling device rotates parts on 5-axis.
- No more manual preparation of weld seams
- Fully automated options available.
- Extensive range of options
- Almost eliminates all vibration to operators' hands and arms



EBSC – Compact single belt grinding

- Small footprint design allows easy integration to most production areas.
- Quick change belt change system
- Simple quick change coupling system efficient tool change
- Option of fully powered deburring unit
- Almost eliminates all vibration to operators' hands and arms



A guide to slitting discs

by Kayson Green

Slitting discs, also known as cutting discs, are thin sheets of abrasive wheels bound with resin. They are used to cut steel, both ordinary and stainless, as well as other non-metallic materials. Slitting discs are used with angle grinders and cutting machines in the production and blanking of steel and non-metal. Depending on the shape and type of material being cut, different discs can be used. In this article from Kayson Green, a leading distributor of abrasives products, it explores cutting discs and what to look for when purchasing them.

Types of cutting wheels

There are two types of slitting wheels that can be fitted into an angle grinder. Depending on the shape being cut, these slitting discs can differ. The first is a flat-cutting wheel, which offers the most versatility when cutting profiles, corners and multiple planes. The second type is a depressed centre cutting wheel that offers extra clearance space for tight corners and overhangs. While both types of cutting wheels have their benefits, most users will find more use in a flat cutting wheel. If you'd like more information on which slitting discs should be used then please feel free to book a site visit with our demonstration vehicle where we can help and advise.

Choosing the grain

The most common grain for cutting discs is aluminium oxide due to its soft bond that is fast and smooth to operate. This type of grain can cut through ordinary and stainless steel, which can be a harder type of steel to cut through. This cutting disc can also cut through other types of metal including aluminium, rebar, and other types of steel.

Choosing the size

How much you need to cut will determine the size of the cutting disc you need. A smaller disc of around 115 mm will not extend far from the angle grinder axle which makes this disc perfect for cutting small amounts of around 50 mm or so. On the other hand, a larger disc of around 230 mm may be ideal for large cuts but will be hard to use and even potentially risky for small cuts. So, you need to carefully consider the size of the disc for the amount you need to cut.

Choosing the thickness

Depending on the type of material being cut, as well as its overall shape and thickness, you will need to choose on the right thickness of your cutting wheel. Between 1 mm and 1.6 mm is a good size for standard jobs involving ordinary and stainless steel, while a 0.8 mm thickness is best for thin pieces of sheet metal. For significantly thicker pieces of metal, you may need to choose between a 1.6 mm and 2.5 mm thick wheel, although you should always lubricate these blades to avoid chipping.

Rubber bonded slitting wheels

In our selection of precision cutting wheels, we have our rubber-bonded slitting wheels for a highly accurate precision cut.



These cutting wheels come in sizes between 25 mm to 350 mm, with a thickness of 0.12mm to 10 mm. We also offer different grain materials including aluminium oxide and silicon carbide. To find out more about our products, get in touch with us today.

Electric angle grinders in foundries

One of the most versatile tools used in foundries is electric angle grinders. Not only do they grind metal, but they can be used to cut, sand, sharpen and polish other materials as well. Electric angle grinders come in a variety of sizes, from small 115 mm grinders suitable for small jobs to 230 mm models or larger which are used in industrial settings. In addition, there are a variety of accessories that can be fitted to angle grinders giving them a wide range of applications. Here is our guide to using angle grinders in foundries.

Using an angle grinder

The first thing you need to do before using your angle grinder is to ensure you are fully protected. PPE gear such as safety glasses will help protect you from any flying sparks. Hearing is also essential along with safety footwear and clothing. Set the angle grinder to the preferred side you wish to use and rotate the safety guard so it matches your position. Clamp your workpiece in place on your work surface to make sure it doesn't slip while you work on it. Switch on the angle grinder and let it build up to its maximum speed. Apply the angle grinder to the workpiece without pushing it and slowly move it back and forth along the line you wish to cut.

Angle grinder components

The type of disc used in an angle grinder allows it to perform a



range of functions. Some disc types used with angle grinders include:

Angle grinder discs

The most common disc used in basic grinding. These come in different sizes and grit numbers depending on the coarseness of the material being ground.

Cut-off discs

Used for cutting metal objects such as bars and sheets. These are generally thinner than angle grinding discs and made from harder materials.

Flexible grinding/flap discs

Similar to grinding discs, these discs are used for polishing and finishing a workpiece. The higher the grit number, the smoother the disc.

Wire brush grinding wheels

These consist of a set of wires attached to a circular base. They are mainly used for removing rust and paint from surfaces to ensure a clean surface.

Diamond cutting discs

These wheels have diamonds fixed to the surface as well as a cutting rim. They are used to cut harder materials such as granite.

Polishing pads

To make any surface look shiny and new, polishing pads come in a variety of shapes and sizes.

Kayson Green Ltd is a leading distributor of abrasive products. With over 45 years' experience of servicing and concentrating on a cross-section of businesses across the British and Irish manufacturing sectors, it



offers proven advice in the specification of cost-effective and innovative abrasive products. Combine this with its access to world-class expertise and it's easy to see why Kayson Green is often the number one choice for industrial firms seeking optimal grinding solutions.

Kayson Green Ltd

Tel: 01206 751500

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Tyrolit returns to UK Metals Expo

September will be a busy month for Tyrolit, amongst many open days across the country, it will be returning to the UK Metals Expo at the NEC in Birmingham from 13th-14th September, **Stand F14**. It is a popular event, bringing the entire Metal Supply Chain together under one roof.

This brings huge opportunities for organisations from any industry to discover first hand, the latest innovations and market developments for abrasives. Over the 2 days, businesses can interact with Tyrolit's industry leading experts on surface conditioning, grinding & abrasive requirements and discuss issues and opportunities to not only educate themselves on product development, but also discover an extended range of products now available to the UK market.

From burr removing with bristle brushes, a complete aluminium range and recently launched cost conscious Egesan cutting & grinding products, to Cerabond X: the latest innovative range of cutting & grinding discs, maximising stock removal, while minimising process time.

Tyrolit will also be showcasing a selection



of tool grinding products for high-speed steel & carbide, such as the Startec range for high strength metal bonded grinding on CNC machine platforms.

As a leading manufacturer of grinding and dressing tools, these events provide the perfect opportunity to demonstrate that Tyrolit is your ideal partner in multiple industries.

Tyrolit is a leading manufacturer of grinding and dressing tools, as well as being a system provider for the construction industry.

Since 1919, its innovative tools have been making an important contribution to

technological development in numerous industries. Tyrolit offers tailored grinding solutions for a varied range of applications and a comprehensive assortment of standard tools for customers all over the world.

The family-owned company based in Schwaz, Austria, combines the dynamic strengths of the Swarovski Group with over a hundred years of commercial and technological experience.

Tyrolit UK Ltd
Tel: 01788 823738
www.tyrolit.co.uk

Hermes to launch two new products

Hermes' research and development, production, application engineering and product management have been quite busy over the past year. Consequently, two new products are coming onto the market this late summer.

The new ZIRCONIT brand stands for robust, very aggressive zirconia alumina abrasive belts. It is available in two versions: without ZR 494 Z and with heat-reducing coating ZR 496 Z. With CERAMIT CR 476 Z, Hermes offers an overall optimised high-performance ceramic abrasive belt with improved grit technology, new backing and likewise heat-reducing coating.

Both types are aimed primarily at applications in the metal sector and, with their coarse grit sizes from +24 to +120, are suitable for all pre-sanding processes where efficient stock removal and a long service life are required. For example, for coarse sanding of sheets and plates, removing burrs and sharp edges, leveling weld seams on round and square tubes, descaling wire, grinding sprues on forged parts and compensating surface defects. They can also be used for specific applications in wood, wood-based materials and composite materials.

As a price-performance grade, ZIRCONIT is the choice when the cost factor is a priority or high durability is required in a process.

CERAMIT CR 476 Z takes you to the next level. Due to the



Abrasive grain	Zirconia alumina
Backing	Very heavy, stiff polyester Z-cloth
Coating	ZR 496: Heat reducing coating
Grit range	# 24 / 36 / 40 / 50 / 60 / 80 / 100 / 120



Abrasive grain	Ceramic
Backing	Very heavy, stiff polyester Z-cloth
Coating	Heat reducing coating
Grit range	# 24 / 36 / 40 / 50 / 60 / 80 / 100 / 120

continuously self-sharpening ceramic grain, CERAMIT reliably delivers higher metal removal rates under appropriate operating conditions, such as higher grinding pressure or faster cutting speeds. In addition, the new type is also the "grinding expert" for special materials or very hard materials, such as titanium or chrome, where ZIRCONIT reaches its limits.

What are you? A zirconia alumina or rather a ceramic type? Either way, you'll find the right solution at Hermes. Contact the grinding experts at Hermes Abrasives Ltd to find the perfect grinding tool for your process.

Hermes Abrasives UK Ltd Tel: 01206 754444
Email: huk@hermes-abrasives.com www.hermesabrasives.co.uk

A Practical Guide to Precision Grinding



This book has been written for the people who, figuratively speaking, put their noses to the grindstone every day. The book distills what the author, Walter Graf, learned during over 40 years in the abrasive industry: Travelling the industrialized world, optimising customers' grinding processes, and giving grinding seminars.

372 pages, divided into some 20 chapters covering, among others, OD & ID cylindrical grinding, centreless grinding, surface and creep-feed grinding, gear grinding, how to run grinding tests, diamond dressing, giving practical advice on effectively running these processes. Excessive wordiness was consciously avoided and counterbalanced by graphics and simple formulas to make the contents understandable, digestible and actionable.

Anyone wishing a summary of the contents, with the first page of each chapter, please send a request to info@adgrind.com

Costs per copy: £71.00 with free delivery

The book is now on stock in the UK at:



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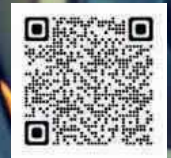
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OR CERAMIC?

Then go for our high-performance ceramic belts for applications requiring extremely high stock removal rates and long tool lives:

CERAMIT CR 476 Z

Either one, you find it at



Contact Nick Geiger
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Megatrends looking for solutions

DEBURRING EXPO

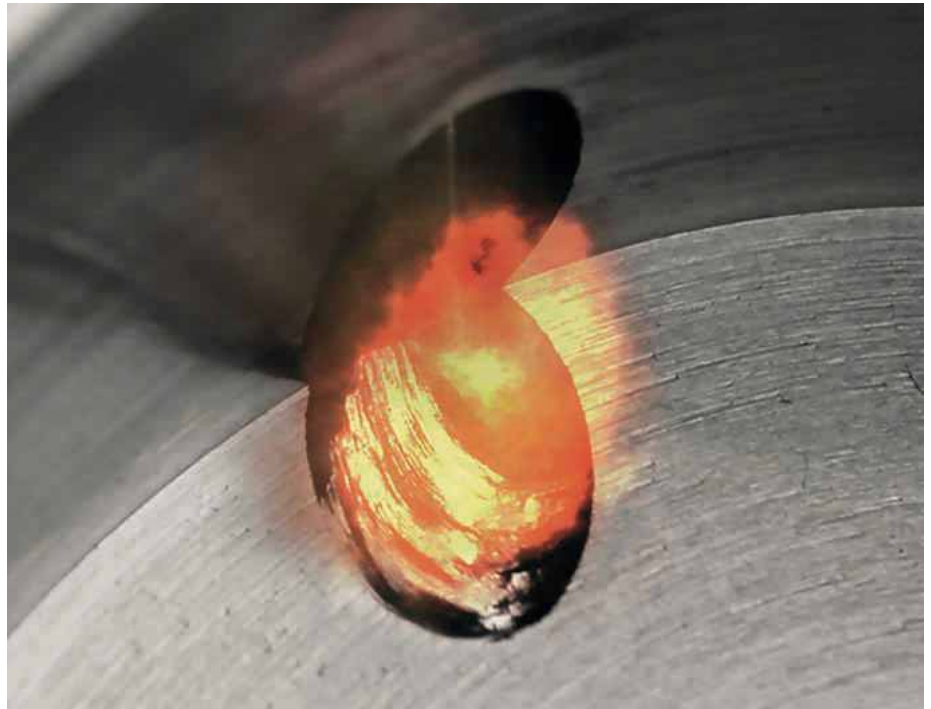
Whether mobility and energy transition, sustainability, health or safety is involved global megatrends have a profound effect on industrial production. They're also impacting demands placed on burr-free components, as well as cleanliness and surface finishing quality.

As the only international trade fair for deburring technologies and precision surface finishing, DeburringEXPO presents corresponding offerings in a concentrated fashion. The bilingual expert forum and various themed areas will also ensure an effective transfer of knowledge at the 5th leading trade fair at the Karlsruhe Exhibition Centre in Germany from 10th-12th October.

Components and the demands placed on their performance and reliability have changed dramatically in recent years in areas such as automotive and machinery manufacturing, medical and pharmaceuticals technology, aviation and aerospace, energy and fluid technology, as well as measuring, sensor and analysis technology. This results in new and different tasks in production steps involving deburring, edge rounding, cleaning and surface finishing. At the same time, factors such as the energy and resource efficiency of the utilised processes and their integration into interlinked production are becoming increasingly important. As a leading international information and procurement platform, DeburringEXPO presents new and further developed, as well as time-tested solutions to this end.

The right process for every application

"Thanks to its multi-industry, multi-material focus, DeburringEXPO supports companies from all industry sectors in their search for suitable processes," reports Gitta Steinmann, project manager at private trade fair promoters fairXperts GmbH & Co. KG. "The entire spectrum of technologies, processes, tools and services for deburring, edge rounding, cleaning and surface



In TEM deburring, the burr to be removed is oxidised by a chemical reaction occurring between the material and the process gas. The process can be used for workpieces made of various metals, as well as for thermoplastics with complex geometries and numerous, difficult to access deburring points.

finishing are presented. The strengths and the limits of the various processes ranging from mechanical deburring with tools to vibratory grinding, brush deburring and blasting with solid and liquid media, right on up to machining with special technologies, can be discussed directly on site." The latter includes, for example, ultrasonic deburring



Ultrasonic deburring takes place in a water basin in which components are advanced to the high-frequency ultrasonic sonotrode.

which makes it possible to selectively deburr edges and cross-drilled holes in a fully automated, verifiable process. Since this energy-efficient process can be used for nearly any material, the range of suitable workpieces covers everything from micro parts for the optics and watchmaking industries to precision tools for machining, all the way up to components used in machinery and vehicle manufacturing weighing 15 kgs. Abrasive Flow Machining (AFM) also covers a very broad range of applications. It's used for the deburring, edge rounding and polishing of components in the automotive and aviation industries, as well as in energy technology, fluid and medical engineering, extrusion technology and mould and tool making. The strengths of this process result from its ability to machine internal areas and surfaces which are difficult to access, for example in additively manufactured components.

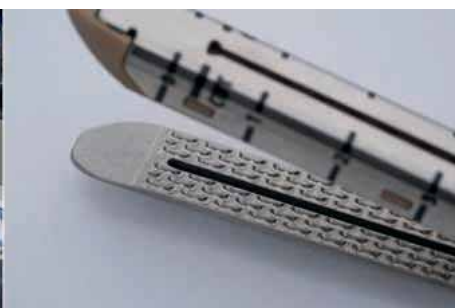
In the case of Electrochemical Machining (ECM), the machining process is based on the anodic dissolution of the respective metal. Nearly all metals can be machined, in particular high-alloy materials such as nickel-based and titanium alloys and hardened materials. In addition to deburring, selective edge rounding and

polishing, the technology is also used for contouring and shaping components, as well as for burr-free drilling for example in the aviation and aerospace industry, the automotive and toolmaking sectors, as well as in medical, microsystems and energy technology. Laser deburring is an effective method for removing fine burrs and flakes from the outer contours of very delicate, thin-walled workpieces. Even the edges of drillholes with diameters of just a few tenths of a mm can be machined. The process is also distinguished by very high processing speeds.

Thermal Energy Machining (TEM) permits the simultaneous removal of external and internal burrs by means of vaporisation. It's used primarily for metal workpieces such as hydraulic manifolds and for components made of thermoplastics from which internal and external burrs have to be removed, even from very difficult to access places.

Bilingual Expert Forum: effective knowledge transfer for added value

To complement the exhibitor presentations, the supplementary programme at DeburringEXPO offers a great deal of



Not only can workpieces be deburred with the ECM process, it can also be used to produce components. In this case a stapler used for closing wounds. Microstructuring takes place in a multiple tool.

knowledge and know-how. Themed zones including: "Automated Deburring", "Cleaning After Deburring" and "Quality Assurance in the Deburring Process" provide information on current developments and trends. Due to its highly practical orientation, the 3-day expert forum integrated into DeburringEXPO is an extremely popular source of knowledge.

The focal points of the simultaneously interpreted presentations, German to English, include fundamentals, approaches to process and cost optimisation, reports on best practice applications and current trends, as well as special content provided

by the themed zones. Trade fair visitors are admitted free of charge and will also receive a free copy of the updated and expanded brochure entitled: "Basic Knowledge in Deburring Technology" in German and English.

For further information, the entire exhibition portfolio and the agenda for the expert forum, as well as the provisional exhibitor list, can be found at:

www.deburring-expo.de

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- ✓ Controlled roughness
- ✓ Deburring

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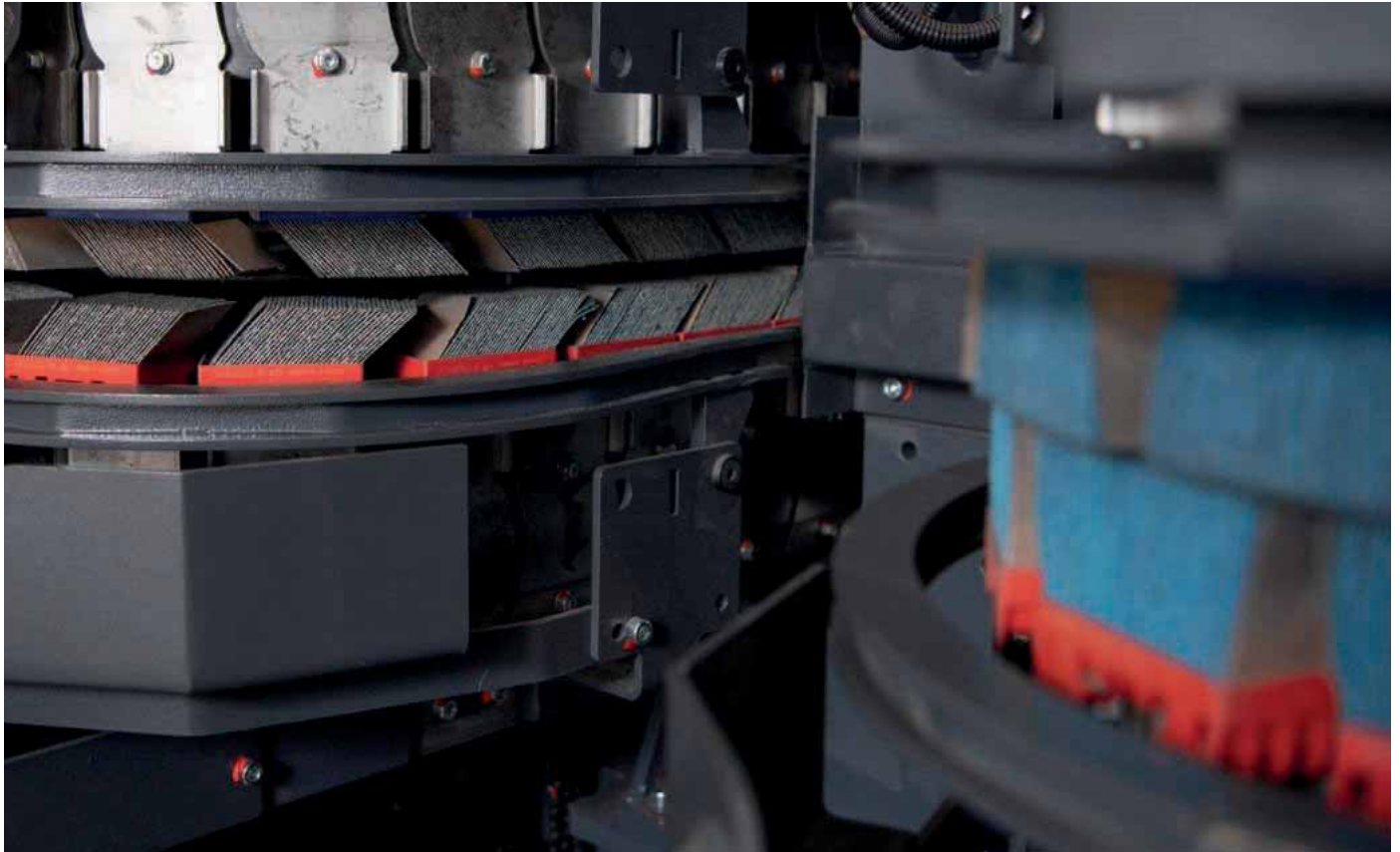


- ✓ Edge rounding
- ✓ Laser oxide removal
- ✓ Heavy slag removal
- ✓ Straight grained finish
- ✓ Controlled roughness
- ✓ Deburring



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How can I find the right deburring machine?

Machines for deburring sheet metal are available in various designs. But the choice between brushes and grinding rollers, single-sided or double-sided processing can be confusing, especially when other units are added. In this article, ARKU will help you find the deburring machine that fits your requirements.

As numerous and different as the deburring processes are, they all have their justification. After all, the burrs on the sheets also differ. In addition, there are other factors such as productivity, flexibility or uniformity of edge rounding. So, in the end, to find the right deburring machine, you have to ask the right questions in the right order.

What must be removed?

When deburring, the burrs are naturally the first thing to be focused on. But one should take a closer look: In thermal cutting processes such as oxyfuel flame cutting or laser cutting, so-called slag forms and the thicker the sheet, the more so. It is not relevant for thin sheets, but it is for heavy sheets. The slag, as a deposit of metal oxide, has different properties from the burrs



themselves, which are made of the base material. It also adheres less firmly to the workpiece and is also softer. Grinding is not recommended here because the abrasives can quickly clog. On the other hand, it can be removed relatively easily by machine using a slag hammer. This system must be connected upstream of the actual deburring machine so that both processes can run without interference.

How big are the burrs that need to be removed?

Burrs adhere firmly to the workpiece and cannot be removed without tools. These tools must also match the size of the burrs, strong enough to remove them, yet fine



enough not to damage the workpiece. The size of the burrs is highly dependent on the sheet thickness.

In general, it can be said that large burrs must be removed with a grinding roller. Brushes, on the other hand, are useful for smaller burrs, secondary burrs and for edge rounding. Accordingly, the deburring machines are designed according to different principles.

How big are the workpieces?

This question is important when deciding whether the deburring machine should work on one side or on both sides. For a machine that works on both sides, the workpieces must have a certain minimum

length, otherwise they will fall through between the brush units. Single-sided deburring machines, on the other hand, have a support, for example a vacuum belt. This can also fix smaller workpieces up to the size of a two-euro coin.

If the length of the workpieces permits, there is much to be said for a double-sided deburring machine. It works much more productively than a single-sided system: The workpieces not only require one pass instead of two, the time for turning and reinserting is also eliminated. Even if the burrs only adhere to one side of the workpiece, a double-sided system offers advantages. Then you don't have to make sure that the burrs are on the right side when inserting.



How important is particularly uniform edge rounding?

Deburring machines not only remove the burrs, they also always round the sheet edges at the same time.

However, if you want particularly uniform edge rounding, one process stands out: processing with rotating brushes. Only they hit the sheet metal from ever different direction.

However, the rotating brushes make it necessary for the workpieces to rest firmly, for example on a vacuum belt. This is only found in a deburring machine that works from one side.

How good must the surface finish be?

Even if a deburring machine mainly processes the sheet edges, a certain ground pattern on the surface is unavoidable. If the customer does not accept this, there are two possibilities: Either you process the parts with your own finishing machine, or you process them with your own unit in the deburring machine. With the second option, however, it must be noted that this is only possible with single-sided deburring systems.



Which is the best deburring machine now?

Every user can only answer this question for himself. The decisive factor is the range of parts to be processed. If one machine cannot process all the workpieces that arise, there is no need to despair. In addition to the option of a second deburring machine, certain parts can also be given to a job deburrer. Financially, both options are more interesting than the laborious and time-consuming deburring by hand.

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ITS. GMBH uses mobile surface measurement to create perfect implants

In order to treat fractures surgically, surgeons need implants that not only provide excellent support, but which can also be easily removed once the fracture has healed. To guarantee the smooth surface of the implants, ITS. GmbH successfully uses the SURFCOM TOUCH 50 measuring device from ACCRETECH. All it takes is a slip and an awkward fall to break a bone. Where a fracture is complicated, surgery is unavoidable. Implants in the form of nails, screws and anatomically shaped plates, among others, provide the stability required. These implants have to meet high standards, because they usually have to be removed after healing and the smoother its surface, the better.

For a sufficiently smooth surface and bio-compatibility, the implant manufacturer ITS. has recently started anodising its implants in-house in order to work more effectively and to be able to offer excellent quality. During the anodising process, the titanium implants are coated with a very smooth, bio-compatible oxide layer that smooths micropores and the finest cracks, thus reducing the possible integration into the bone tissue and the dreaded cold welding of screws. "In order to be able to guarantee the smoothest possible surface of the implants, we determine the surface roughness of the implants using the SURFCOM TOUCH 50 from ACCRETECH before and after anodising," reports Lukas Feichtenschlager, product manager at ITS.

Fast measurement of even hard-to-reach places

Surgery should be performed as early as possible to stabilise the fracture for movement and weight-bearing. Screwing is often combined with other methods, e.g. with traction screws through a plate. Such a plate is made of titanium grade 2, but the screws are made of a harder titanium alloy. This way the holes do not need threads. If a set screw is used, it creates a thread in the plate itself. Nothing is cut and therefore there is no dirt in the wound during the operation.

To guarantee the smooth surfaces of the implants, they are measured before and



after anodising at predefined measuring points with the SURFCOM TOUCH 50 from ACCRETECH. Thanks to its high stylus axis range, even hard-to-reach places can be measured, which is a great advantage because implants are often irregularly anatomically shaped and therefore rarely have flat surfaces. About three parts per minute are tested.

"We bought the unit because it is good value for money and in this price range the unit is unbeatable. The system is also simple and can be operated with a short training session for the employee," summarises Lukas Feichtenschlager. In addition, he points out that the measurement data not only guarantees the high quality of the implants, but also forms a basis for the research and development of new implants. For example, ITS. will soon be launching a new hip nail.

Some specifications need to be observed

The confirmed quality of the implants depends on the correct use of the measuring equipment and the chosen measuring strategy and this includes not only the right choice of probe. Since dust

deposits or lubricant residues on the surface distort the measurements, the user must ensure that the probes are well maintained and have clean surfaces. Factors such as temperature, humidity or potential sources of vibration also affect the measurement result. The environmental conditions must therefore be checked in advance, because customers rely on the measurement results being correct, i.e. the implants being sufficiently smooth, because ultimately the well-being of the patients depends on this.

For ITS., it is practical to be able to measure workpieces directly in production thanks to mobile surface measurement. Individual parameters and measuring conditions for different workpieces can be stored in the instrument memory and called up as required. Changing between workpieces is quick and uncomplicated and a large area of production can be covered with it.

In order to be able to offer the ideal implants for surgical fracture treatment in the future, ITS. is conducting research with surgeons to optimally adapt the geometry and composition of the implants to the

possible treatment options. "With our dedicated focus on developing and expanding our portfolio of implants and services, our goal is to soon be able to serve more than 90 percent of all trauma indications and the SURFCOM TOUCH 50 is indispensable here," reports Lukas Feichtenschlager.

Excellent operability thanks to smart user interface

The measuring system offers high resolution over the largest measuring range in its class thanks to an advanced detector. The probe can be changed to suit

deep, long or small bores as well as round surfaces, making it easy to measure different types of workpieces, ideal for checking irregular, anatomically shaped implants.

The Z-axis measurement range covers 1,000 µm to 2,000 µm, with a minimum resolution of 0.0001 µm. It eliminates time and effort aligning the workpieces. The device not only measures flat surfaces, but also detects the roughness or waviness of graduated or round surfaces with a single measuring track. Levelling and zeroing before measurement is also possible without any problems. Measurements of vertical surfaces, overhead measurements

and measurements of narrow areas are also possible.

The transportable, compact feed unit is easy to install and offers an X-axis measuring range of 50 mm, a guiding accuracy of 0.3 µm/50 mm and a vertical positioning range of the detector of 50 mm. Safe positioning at constant speed is made possible by operating the feed unit in the X direction from the amplifier screen.



The self-explanatory screen makes it easy to set measurement conditions, perform calibration, measurement and analysis safely and makes operation simple and intuitive. The instruction manual itself is designed like a manual for household appliances. A quick reference illustrates the basic steps so that the user does not have to write procedures.

USB/micro-USB ports are available as standard. A total of 15 measurement conditions and 20 measurement results can be stored in the SURFCOM TOUCH evaluation unit. For more, a USB memory can be connected to the standard USB port. The evaluation unit is also equipped with a micro-USB connection and with a USB cable, measurement data can be transferred to the computer and evaluated. This is an advantage for ITS because it means that there is always sufficient storage space and data processing capacity available when large amounts of data are generated in the development work for new implants.

ACCURETECH SBS UK Ltd

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LK celebrates 60th anniversary

Established in 1963, LK Metrology has an impressive heritage dating back to the birth of Coordinate Measuring Machine (CMM) technology. Founded by former Rolls Royce engineer and CMM pioneer Norman Key and his father-in-law Jim Lowther, the company is credited with many innovations in the CMM industry. In 1972, in partnership with Rolls-Royce, Norman Key worked alongside the person who would co-found Renishaw a year later, Sir David McMurtry, who today is its executive chairman, to develop the now industry standard Renishaw touch-trigger probe.

Other industry firsts accredited to LK include successive introductions to the market of the bridge-type CMM, inspection software, exclusive use of air bearings and granite guideways, carbon fibre composite spindles, microprocessor-controlled drive systems, true thermal stability of the measuring platform and a high-accuracy horizontal-spindle CMM.

With its headquarters, product development and CMM manufacturing facility in Castle Donington, UK, the

company is headed by owner and CEO Angelo Muscarella, whose ASF Metrology group bought the company in 2018. It now not only manufactures CMMs but has also added to its product portfolio a range of FREEDOM branded portable measuring arms and many metrology accessories. They include a new range of laser scanners, a surface roughness probe, stylus cleaning and sensor changing equipment, an indexing table and a checking gauge for CMM calibration. First written in 1977, LK's renowned CAMIO measurement, programming, analysis and reporting software is continually enhanced to provide leading functionality.

Angelo Muscarella comments: "When I acquired LK, many staff had been with the company for decades and continue to give their total commitment. They, and indeed I, are proud to work in such a prestigious company. There is dynamism throughout our network of offices and distribution companies around the world, with everyone sharing common values and operating as a family."



"We are looking forward to maintaining our rapid growth and would like to thank all our customers for making this possible."

Brian Samson, managing director of LK Metrology Inc in New Hudson, Michigan is pleased to report strong trading in the United States: "We and the Precision Measurement Group of the Cross Company have finalised an agreement that brings the LK line of CMMs and related metrology products to the Cross Company's calibration labs and service centres across Southeast and Central US."

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Covalent offers fast, high-res surface imaging for full wafers with CT300 system

The new, high-resolution profilometer at Covalent Metrology enables non-destructive, high-speed imaging analysis on larger and more intricate samples than ever before

Covalent Metrology, a premier analytical services provider in North America has announced the installation of a high-speed profilometer from cyberTECHNOLOGIES, a leading manufacturer of advanced 3D surface measurement systems for industrial and scientific applications. The CT300 scans an order of magnitude faster than previous systems and accommodates a substantially enlarged scan area while maintaining nanoscale vertical precision. Ready now, the tool works best for non-contact imaging analysis on semiconductor wafers, PCBs, BGAs, micro-lens arrays, and microfluidic devices.

Optical profilometry is ubiquitous for measuring and mapping the subtle topographic features of flat surfaces. The CT300 is especially useful for inspecting wafers used to develop advanced nanomaterials and semiconductor devices. With a vertical resolution better than ~500 nanometres, the CT300 system can accurately measure surface roughness, map topographic variations, and quantify bow or warp across wafers up to 300 mm in diameter. This data empowers engineers to refine the yield and quality of their fabrication processes.

Flexible optics in the CT300 preserve its high lateral resolution and broaden the range of its applications. In addition to wafers, more textured and 3-dimensional surfaces can also be characterised. Specialised detectors facilitate accurate depth measurements on and below the surface of transparent materials. The CT300 is a prime system for analysing the hollow glass channels in microfluidic devices or measuring crucial parameters in finely-controlled optical materials, such as micro-lenses, light sensors, and components.

Beyond its flexibility and resolution, the CT300 is also unbelievably fast. It uses a linear sensor array to scan line-by-line, rather than the point-by-point raster used by past systems. This accelerates measurement speeds by an order of magnitude, enabling Covalent to offer faster turnaround times and more affordable imaging services on an expanded range of sample types.

"With the CT300, Covalent can continue to provide our clients with cutting-edge profilometry and topographical analysis capabilities," says Dr. Avery Green, director of Thin Film and optical metrology at

Covalent Metrology, "It also marks an exciting expansion to our higher throughput solutions.

Covalent can now offer differentiated services that help position us as a leader in surface analysis for semiconductors, optics, consumer electronics, medical devices and beyond."

Though this is the first cyberTECHNOLOGIES instrument to be installed at Covalent, the companies anticipate ongoing collaboration in expanding access to advanced analytical capabilities in North America.

"We are thrilled to be working with Covalent to expand awareness and develop new applications for the CT300," says Karl-Heinz Strass, managing director at cyberTECHNOLOGIES, "the features of this tool could help engineers solve entrenched challenges in semiconductors, biotechnologies, medical devices, electronics and more. Covalent is ideally positioned in the heart of Silicon Valley to help clients tackle those challenges with the CT300 profilometer."

About Covalent Metrology

Covalent Metrology is a disruptive analytical services laboratory and digital platform based in Sunnyvale, California. Its mission is to help companies using and developing advanced materials to get better data and insights. Covalent strives to make it easier and more affordable than ever to drive strategic decision-making with quality metrology data, facilitating faster research, development and production of innovative materials and devices. It is dramatically changing the materials characterisation services landscape by combining an advanced data platform, world-class analysts and top-notch customer service, state-of-art tools and strategic partnerships. Covalent now has over 500 customers in 30+ industries.

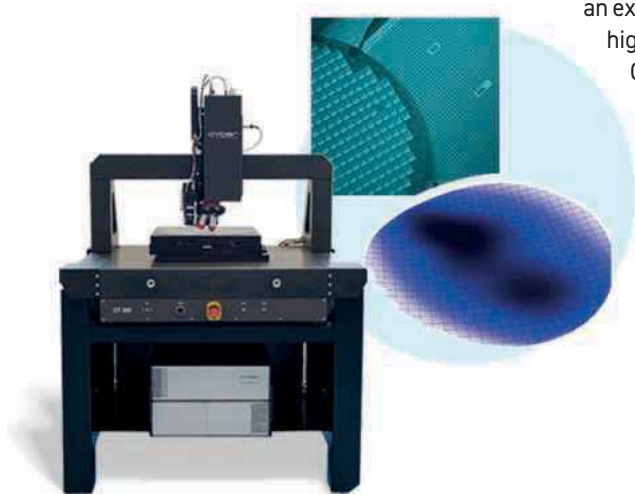
About cyberTECHNOLOGIES

cyberTECHNOLOGIES is a leading provider of high performance and easy-to-use high resolution 3D optical metrology systems. Its advanced systems are widely utilised for industrial and scientific applications. The high-resolution optical sensor with a white and infrared light source, together with the specifically designed highly precise x/y scanning stage and sophisticated software, are the core of the system and produce reliable and dependable results.

Covalent Metrology

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Fast, High-res Surface Profiling on Large Areas: Up to Full 300mm Wafers!

Groundbreaking measurement automation for precision dies and edge preparation on round tools

At EMO 2023, Bruker Alicona, a leading provider of advanced metrology solutions, will show its latest developments for measurement automations for precision dies and edge preparation on round tools. These solutions set new standards in terms of speed, accuracy, repeatability, and traceability. Experience them live for the first time at EMO in Hannover.

Edge preparation, a fundamental process in precision engineering, holds immense significance in enhancing the quality of



round tools. By carefully shaping and refining the cutting edge of tools like drills, drills with shaft, end mills and reamers, edge preparation eliminates imperfections, reduces tool failure and optimises performance. The process not only extends tool lifespan but also improves machining accuracy, surface finish and productivity. Embracing edge preparation empowers manufacturers to unleash the full potential of their round tools, achieving unparalleled precision and competitiveness in today's demanding manufacturing landscape.

Bruker Alicona's automated edge preparation measurement system revolutionises the process with just three simple steps. The round tool is securely clamped in the rotation unit, followed by automatic alignment to the CAD model using MetMaX, the proprietary software. Operators can effortlessly select the desired edges for automatic measurement and evaluation, streamlining the entire process.

Bruker Alicona's commitment to technological advancement extends to the precision die industry as well. By introducing automated measurement solutions for stamping dies, punching and bending tools, the company enables manufacturers to achieve unprecedented levels of accuracy, efficiency and reliability in their production processes.

Its turnkey automated optical measurement solution evaluates the complete surface of the form-giving shape for manufacturing tolerances as low as 0.010 mm, while tactile-based technologies reach limits such as long measuring times, limited 2D profile evaluations or compromises in accuracy and resolution.

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Hall 6 - Stand E39

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needs, assess their goals and create a customised plan that aligns with their operations.

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Polishing steel alloys

Steel alloys are highly valued in medical applications such as dental implants and orthopaedic surgery due to their excellent mechanical properties, durability and biocompatibility. The use of stainless-steel alloys in medical implants is common because of their superior corrosion resistance and low risk of infection. Additionally, they are cost-effective and relatively easy to manufacture and test. However, to ensure the optimal performance and longevity of steel alloy implants, they must undergo a process known as lapping and polishing. Lapping and polishing are crucial steps in the manufacturing process that remove surface irregularities, burrs, and scratches and result in a highly polished and smooth surface.

The lapping and polishing process involves the use of specialised machinery that utilises abrasive particles to grind and smooth the surface of the implant. One such machine is the Kemet SpheriMatch machine. This machine is designed to be highly precise and accurate, producing a uniform and consistent finish. The machine uses a range of abrasive particles and polishing compounds that are tailored to the specific type of steel alloy being processed.

The benefits of lapping and polishing steel

alloy implants are numerous. A highly polished surface reduces the risk of corrosion and bacterial growth, which can lead to implant failure or infection. Additionally, a smooth surface can reduce the friction between the implant and the surrounding tissue, leading to a more comfortable and successful implantation. Furthermore, a polished surface can enhance the aesthetic appearance of the implant, which can be important in cosmetic applications such as dental implants.

Lapping and polishing steel alloy

Test Requirements: To develop a process to polish a spherical cap

Equipment used: Kemet SpheriMatch machine, NLH cloth, 3-micron type k slurry, Customised lap, 15" pressure weight, Co42 cleaning fluid

Process breakdown

To perform lapping and polishing on a steel alloy spherical cap, several pieces of equipment are needed. These include the Kemet SpheriMatch machine, NLH cloth, 3-micron type k slurry, a customised lap, a 15" pressure weight and Co42 cleaning fluid. The first step in the process is to fix the spherical cap onto the 15" pressure weight using foam tape. The pressure

weight is then placed into the jaws of the SpheriMatch chuck and tightened using a key. Next, the customised lap is placed on the sweep arm and positioned to cover half the area of the cap, with the sweep length adjusted to give a slight sweep of about 10 mm. The machine is then run for 10-minute cycles while 3-micron type k slurry is applied every 2 minutes from a trigger spray. The process is repeated for around 6 cycles until the desired finish is achieved. Finally, the part is cleaned with Co42 cleaning fluid. After polishing the steel alloy cap using this process, the surface is smooth and polished to a high degree, making it suitable for use as an implant in the human body. The lapping and polishing process ensures that the implant is free of any rough edges or imperfections that could cause irritation or other complications.

The lapping and polishing process is a critical step in the manufacturing of steel alloy implants. It ensures that the implants are of the highest quality, and have the necessary characteristics required for medical applications. A highly polished and smooth surface enhances the performance and longevity of the implant, reduces the risk of infection and corrosion and improves the aesthetic appearance of the implant. Therefore, it is important to use specialised machinery such as the Kemet SpheriMatch machine to achieve a high degree of accuracy and precision in the lapping and polishing process.

Lapidary polishing using diamond compounds

Lapidary is the art of cutting, shaping and polishing stones and other hard materials to create jewellery, decorative objects and sculptures. This craft requires specialised tools and techniques, which is why many jewellers outsource lapidary work to specialists. However, with the right attachments and polishing compounds, beginners can handle nearly every job a full-scale lapidary unit can with a flex shaft or micromotor.

The use of diamond paste in lapidary polishing has several benefits. Firstly, diamond paste is highly effective in polishing hard materials like quartz, corundum and topaz which can be challenging to work with using traditional polishing compounds. Diamond paste can





also be used to achieve a high level of polish on softer materials like jade, turquoise and lapis lazuli, which can be difficult to achieve with traditional polishing compounds. Another benefit of diamond paste is that it is highly precise, allowing lapidary artists to achieve intricate designs and shapes with greater accuracy. The fine diamond particles in the paste can reach even the smallest crevices and angles on the surface of the material being polished, resulting in a more uniform and consistent finish. This precision is especially important in the creation of faceted gemstones, where the angles and facets need to be polished to a high degree of accuracy. Diamond paste is also highly durable, which means that it can be used repeatedly without losing its effectiveness. Unlike traditional polishing compounds, which can wear out quickly and need to be replaced frequently, diamond paste can be used for multiple polishing sessions, making it a more cost-effective option in the long run.

When it comes to lapidary work that serves general purposes, one typically makes use of a fast-running handpiece equipped with diamond burs to drill through

hard materials like stone. Once the drilling is done, the stone is polished using diamond pastes or compounds charged on felt, wood, or leather attachments. Although this process can be messy and loud, the end result is worth the effort. One of the most important aspects of lapidary polishing is choosing the right polishing compound. This decision depends on what material you are cutting, how hard the material is, and whether the compound might stain or damage the material. There are two main types of polishing compounds: oil-soluble and water-soluble.

Water-soluble compounds work well on most materials, but they can rust your tools over time. Steel and water do not mix well, so even with careful usage, steel mandrels may eventually rust. On the other hand, oil-soluble compounds alleviate this problem and work particularly well on difficult-to-polish materials such as rhyolite, ruby and sapphire, as well as stones with mixed areas of softness or hardness. Oil-soluble compounds flow more easily over stones and are less likely to "grab," which is a common problem with water-soluble compounds.

To initiate the process of lapidary polishing, it is recommended to employ Diamond Compound Type L. This entails utilising four specific micron grades, including 45 micron and 25 micron for the purpose of shaping, 14 micron for polishing, and finally, 1 micron to attain a superior level of polish.

To use the Diamond Compound, begin by squirting lubricating fluid into a small dish and adding a small amount of diamond compound to form a paste. Then, soak the felt bob or wheel into the mixture and work it smoothly over the surface of the stone. It is important to clean the stone with detergent and a clean, soft brush each time you change grits to avoid mixing a coarser grit with a finer one and accidentally scratching a stone. Organising the syringes, wheels and bobs according to their respective grit is crucial for proper storage, as it helps prevent cross-contamination.

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Robot-ready grinding systems for high-speed production

In the manufacturing process, it is often necessary to grind metals and alloys to certain specifications. However, the process of bringing a stock sheet or plate to precise dimensions has traditionally been time-consuming and labour-intensive. Although today's automated advanced rotary surface grinders have resolved these issues to speed production dramatically, loading and unloading the workpiece typically still requires an operator.

To fill in this missing piece of the automation process, rotary surface grinders are now available in "robot-ready" versions for easy connection and integration with third party robotic arms. By adding robotics for the loading and unloading of workpieces, machine shops and OEMs with higher production demands can now substantially increase cycle times while improving precision on unattended machines.

To facilitate the automation of the loading and unloading of its rotary surface grinders, DCM Tech redesigned the IG 82 Series to include discrete digital I/O inputs and outputs for easy connection to virtually any third-party robotic arm. Industrial robotic arms emulate the movements of a human arm using multiple rotary joints that act as axis points. The end of the robotic arm is fitted with a fingerlike gripper, designed to safely manipulate and handle parts. These devices include a controller, actuators, sensors, software and vision systems if needed.

Once programmed by the integrator, the robotic arm will load and unload the part, as well as clear away any debris before repeating the process.

With vertical spindle, rotary table surface grinders, the table rotates with the workpiece held firmly in place underneath a vertical spindle. The grinding is not performed by the peripheral edge of the wheel, but by the entire diameter of the abrasive surface, which facilitates grinding performance and consistency. The surface grinders are designed with advanced sensors and controls that automatically maintain very tight tolerances, removing material down to within one ten-thousandth of an inch of the final thickness.



By adding robotics for the loading and unloading of workpieces, OEMs and machine shops with higher production demands can substantially increase cycle times while improving precision on unattended machines



Automated rotary surface grinders already provide advanced features that minimise or eliminate operator intervention after set-up

The IG 82 series grinders already provide advanced features that minimise or eliminate operator intervention after setup.

One example is the part detection system, which automates the initial contact between the abrasive wheel and the part. In the past, this typically had to be finessed by the operator.

Automatic part detection eliminates the need for the operator to do time consuming, error-prone 'manual touch-offs,' where they would manually feed the grinding machine until it just touches the surface of the part before backing off and restarting it.

For high-volume production, it is also necessary to periodically dress the grinding wheel. It is vital to remove grains, clogs, and excess bonding material so the wheel can return to its original surface finish and sharpness. Dressing is also used to help restore the wheel's shape, which changes with wear. The IG 82 series comes with a programmable auto-dress capability with

selectable dress frequency. The advanced rotary surface grinders are already much faster than conventional reciprocating grinders because the units can get much closer to the required dimensions before any finishing steps. This capability can reduce or even eliminate some lapping and polishing steps.

With a conventional surface grinder, if stock with standard thickness needed to be ground down, an operator would stop short of the required removal and leave an unpolished surface. Using another machine was often required to remove the remaining material, but this could involve excessive time and labour.

For routine processes, the use of a variety of grind "recipes" with sets of parameters for specific parts can further speed production, enhance quality, and aid in quick changeover. Different grind recipes can be set for different customers, material types, or even part numbers so complex programming or data does not need to be entered at the start of each job. A new recipe can be created for job variations, such as a different finish or number of parts.

The automation already provided by an advanced rotary grinder combined with a robotic arm will allow the operator to set up the machine and then attend to other tasks. The machine does not need to be constantly monitored because it has built-in load monitoring.

DCM Tech

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Enhancing safety and maximising productivity in lifting and handling

When you're working with heavy materials such as steel and other ferrous metals, safe and efficient lifting and handling is essential. But this often comes at a price, with businesses forced to make the choice between cost and safety.

Eclipse Magnetics believes that you shouldn't have to make that decision. After all, you can't put a price tag on safety. That's why it created the innovative new Ultralift E magnetic lifter, offering high performance lifting at a competitive price. So, you can prioritise both safety and productivity without the inflated price tag.

The brand new Ultralift E magnetic lifter utilises the latest magnetic technology to provide a cost-effective lifting solution. With capacity to lift up to 1,000 kg, depending on model, the technology is extremely easy to operate and requires no electricity for operation.

This enables Ultralift E to deliver world class results when handling ferrous loads compared to traditional methods such as slings, chains, hooks and grabs. With a guaranteed Working Load Limit (WLL) of 3:1, you can rest assured that the Ultralift E



provides a safe and efficient way to lift ferrous loads in your factory, workshop or warehouse.

The Ultralift E magnetic lifter has been designed with safety at the forefront. It uses permanent magnetic technology and is suitable for single person operation. Not only this, but it also features a safety catch which must be pressed before the magnet can be switched on or off. This provides further reassurance that the load cannot be accidentally released when in use.

The innovative design of the Ultralift E means that it is supplied with a 12-month warranty. Eclipse Magnetics also offers an annual ServiceCare package, along with in-house repairs by its own skilled engineers.

Productivity is key in every industry and the Ultralift E makes productivity a priority. This magnetic lifter is simple and easy to use, enabling quick single face engagement with the load. Simply press the safety button and lift the lever to turn the magnet on and off it's as easy as that.

The Ultralift E is a cost-effective solution for safe, high-performance lifting, requiring low investment. There are no ongoing running costs as it runs on permanent magnetic technology rather than electricity and there is no risk of damage to the load.

Ultralift E can be used for both flat and round section steel so you only need one lifter. Combined with its compact size, this can help to optimise your storage space and reduce your inventory.

With no electricity required for operation, the Ultralift E is a sustainable choice for businesses. Not only that, but it is also supplied in fully recyclable packaging.

Eclipse Magnetics

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*Model featured is ULE0600. £199 is based on ULE0100. Price varies depending on model.

Sharpening technologies for tool production

At EMO, Vollmer will be showing its latest sharpening machines and services. The machine builder will be presenting automated grinding, eroding and laser machines that can be used to machine tools made of ultra-hard cutting materials such as PCD, CBN or carbide. Vollmer will also be providing information on its maintenance and training services and its digital V@dison solutions. In addition, its subsidiaries Loroach and ultraTEC Innovation will be exhibiting their products on the Vollmer stand.



As a leading production technology trade fair, EMO is increasingly focusing on the interlinking of products and services. This makes EMO the ideal place for Vollmer to showcase its machines, services and digital solutions. As a full-line supplier, Vollmer covers all production technologies with which rotary tools as well as circular and band saws can be machined - regardless of the cutting material used.

Producing tools with grinding, eroding or lasering

This year's product highlight at EMO will be the VHybrid 260 grinding and eroding machine, which can grind and erode 100 cutting tools. It features multi-level machining, which is realised via two vertically arranged spindles. Here, the lower spindle is designed for both grinding and EDM. With a new V@dison booster solution, the VHybrid 260 achieves a surface quality of up to 0.05µm Ra, micrometre/centre roughness value, when eroding PCD tools. Thanks to the digital application, EDM can be integrated as a complete manufacturing process into tool production. With the Vpulse EDM generator, even the smallest micro tools with diameters of 0.5 mm and smaller can be produced with the highest precision, performance and surface quality. High-precision machining is



The VGrind 360S machine with multi-level machining

achieved via the integrated 'Laser Check' measuring system, which achieves required tolerances of $\pm 2\mu\text{m}$ in fully automatic closed-loop round machining.

Automation for all sharpening machines

The VGrind 360S tool grinding machine at EMO also features the concept of multi-level machining. At the show, Vollmer will focus on the machining of CBN tools and how tool manufacturers can use the machine to individually configure and equip their production, regardless of whether they manufacture special tools or produce tools in high volumes. With appropriate automation such as the new HP 170 pallet magazine, the HPR 250 free-arm robot or the HC4 chain magazine, the VGrind 360S is suitable for unmanned machining around the clock. With the HP 170, optical detection of the cooling channels is optionally integrated. In addition, up to eight grinding wheel packs including the coolant supply can be changed fully automatically.

The Vollmer laser machine at EMO will be the VLaser 370. It can machine ultra-hard materials directly in the pivot point thanks to patented kinematics that effectively produce tools with high precision thanks to fewer compensating movements. In addition to its machines, Vollmer will also be presenting the products and services of its subsidiaries Loroach and ultraTEC Innovation. Loroach manufactures machines for sharpening circular saw blades. UltraTEC Innovation offers ultrasonic deburring systems that can be used to



deburr components made of metal or plastic without contact and in a resource-saving manner.

Services and digital solutions from Vollmer

With its services for maintenance, repair, training, financing and digitalisation, Vollmer completes its EMO trade fair presence. These offerings include the digital initiative V@dison that incorporates the V@boost solution 'Performance Package for the VHybrid 260'.

"The positioning of EMO as the world's leading trade fair for production technologies coincides with our corporate philosophy because we are the world's full-liner for sharpening technologies to manufacture tools with high precision and automation," says Jürgen Hauger, managing director of the Vollmer Group. "We don't just offer a very specific process, but the exact process that customers need. In addition, we flank our machines with individual services and digital solutions to optimally support tool manufacturers and sharpening services in automated and cost-efficient production."

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Walter showcases machine and technologies for efficient and effective tool and insert processing

Walter Ewag UK reports that the United Grinding stand at EMO will feature a host of Walter machines and technologies for more effective and efficient tool and insert grinding and erosion, with parent group United Grinding's revolutionary C.O.R.E. (Customer Oriented REvolution) hardware and software architecture and Walter's innovative Laser Contour Check non-contact tool measurement development in particular sharing centre stage.

The C.O.R.E architecture embraces the digital age by having intuitive operation that facilitates machine setup, operation, networking and maintenance, underpinned by 'work simplification in production' to, says Walter Ewag UK's sales director and general manager, Philip Morris: "pave the way for a new generation of machine tools which fully embrace the digital age."

Laser Contour Check is now optional on all Walter Helitronic tool grinding and erosion machines and it ensures high-precision and fast in-process measurement of tool parameters using blue laser technology in conjunction with intelligent measuring to measure various features on cylindrical tools from 1 to 52 mm diameter. Any deviations are compensated for directly during the machining process.

Laser Contour Check's analogue laser beam measures a tool's entire contour rather than measuring at specific points as with tactile or digital methods. Laser technology also avoids possible damage to the tool's cutting edges as well as measuring errors that could occur due to probe tip wear during tactile measuring routines. The measuring system can be integrated directly into the machine's working area and moves into position when required.

Both C.O.R.E and Laser Contour Check will be demonstrated at EMO on Walter's Helitronic Mini Plus and Helitronic Micro tool grinders; the former for producing tools of 1 to 16 mm diameter and up to 255 mm long and regrinding tools of 3 mm to 100 mm diameter; the latter machine for processing tools from 0.1 mm to up to 12.7 mm diameter and 220 mm long.

Helitronic Mini Plus can be supplied by Walter Ewag UK as a cost-effective 'basic'



machine or as a fully automated model. The basic version can be configured with a wide range of efficiency options and various loading systems, effectively extending it to a fully-equipped 'high-end' tool grinder capable of all current and future applications in the small and medium tool diameter range.

Also on show at EMO will be the Walter Helitronic G 200 tool grinder which, with a maximum grinding wheel diameter of 150 mm, can process tools of 1 mm to 125 mm diameter and up to 235 mm long.

Alongside these at the show will be the two-in-one, grinding and erosion, Helitronic Vision Diamond 400 L for tools of 3 mm to 315 mm diameter and up to 420 mm long and this will feature a Robot Loader 25.

Insert grinding is the forte of Walter's 6-axis Compact Line which is designed for processing, including peripheral grinding, inserts of tungsten carbide, cermet, ceramic, PCBN and PCD and a particular feature is the application of protective chamfers on inserts' main cutting edges. The machine also has a 'three-in-one' dressing unit that ensures grinding wheel concentricity and high process reproducibility, plus it offers wheel dressing, regeneration and 'crushing' in a single package.

Walter's tool measurement expertise will be highlighted by the Helicheck Nano, the

world's first automated measuring machine for 'micro' and 'nano' tools as small as 0.1 mm diameter and standard tools up to 16 mm diameter and the Helicheck Plus with 3D sensor.

Walter says that the comprehensive measurement of tools with diameters of less than 1 mm is usually fraught with problems and that even the use of microscopy sees human operation posing the greatest risk of error.

The Helicheck Nano takes a different approach, however, offering non-destructive and operator-independent reliable measurement of tools using transmitted and reflected light. It's a process made possible by the use of variable optics having up to 800x magnification and, in combination with high-resolution cameras, these microscopic optics are the basis for measurements in the nanoscale.

Importantly, the machine offers the possibility of automation with a robot loading system enabling up to 7,500 tools to be measured without operator intervention.

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Hall 11 - Stand E34

NUM releases major update to NUMROTO tool grinding software

NUM has released a major update to its renowned NUMROTO tool grinding software which includes a host of new functions to further accelerate the productivity of tool grinding machines.

Version 5.0.0 of NUMROTO provides CNC grinding machine users with an unprecedented level of flexibility. It is likely to be of special interest to tool manufacturers seeking to increase their productivity of precision drills, subland step drills, end mills and form tools.

NUMROTO features a true multiuser environment. The new version of the software allows much more detailed definition of user administration rights to help improve machine management and better protect valuable machining data.

NUM has significantly enhanced the speed, functionality and ergonomics of NUMROTO's profile editor. The new Profile Editor X enables contour lines and radii to be drawn using a computer mouse, with all elements clearly displayed in tabular form and with one-click sizing information. When importing a DXF file, all existing layers are



displayed in a preview window. Profile Editor X also offers a spline to polyline conversion facility, enabling splines to be read in and automatically converted to segmented lines with a maximum user-specified tolerance.

NUMROTO 5.0.0 introduces two new functions for machining drills and step drills and no less than seven new functions for end mill production. When using a peripheral grinding wheel for chamfer relief of a drill, the inside or outside edge of the wheel can be selected and, at the end of a clearance relief operation on a drill, it is now possible to program a disengage chamfer.

The new functions for end mills

encompass a multitude of machining operations and read like a user's 'wish list'. Up and down cutting is now possible and employs a simplified geometry dialogue. New functions are available to simplify the cutting of S-shaped and straight chisel edges and with separate increments for ball relief chisel edges. A radius can now be ground at the end of the cutting length. Separate feed rates can be programmed for the grinding wheel engagement and disengagement slants and the cutting and displacement angle of relief operations can now be individually programmed for groups of teeth.

NUMROTO software is currently used on more than 100 different types of machines from 20 prestigious international manufacturers in 50 countries worldwide.

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German screw compressor manufacturers order four British-built PTG Holroyd rotor milling machines



In just one week, Rochdale-based PTG Holroyd has secured orders for four of its EX Series CNC helical rotor milling machines from two German-based screw compressor manufacturers. The machines will be shipped during 2024. Their combined value is in the region of £5 million.

Two of the machines, both 3EX-R models, for helical parts of up to 350 mm in diameter, are destined for a leading producer of screw compressors for refrigeration applications. The other two EX rotor milling machines, a 3EX-R and a 4EX-BL model, for milling parts of up to 420 mm in diameter and Roots-type blowers, have been ordered by a specialist in screw compressors and energy efficient blowers.

"PTG Holroyd's EX Series rotor milling machines have long been renowned for their performance, precision, reliability and repeatability, regardless of whether they are producing highly complex components

with helical screw profiles, or milling worms and gear parts," comments PTG Holroyd sales director, Mark Curran. "Never content to rest on our laurels, however, we have added some key upgrades to the entire EX Series range, perhaps the most significant of which is the use of the Sinumerik ONE future-proof CNC from industrial automation specialists, Siemens."

PTG Holroyd was the first UK machine tool manufacturer to embrace the benefits of the Sinumerik ONE control, choosing the CNC for its recently launched HG350 range of gear, worm and screw pump grinding machines. It was a decision that enabled the company to bring the new HG range to market much sooner than otherwise would have been possible. It also meant that HG Series customers benefited from a future-proofed operating system, class-leading integrated safety and failsafe features, enhanced reporting of machine

health and performance data and uncompromising levels of industrial security.

"Our positive experiences of using the Sinumerik ONE CNC for the HG350 grinding machine range, combined with excellent customer feedback, confirmed our decision that it was the right control for our upgraded EX Series of rotor milling machines," adds Mark Curran.

Digital twin for 'right first time' approach

By working in close collaboration with Siemens, PTG Holroyd has also been able to incorporate the 'Create my virtual machine' and 'Run my virtual machine' software capabilities of the Sinumerik ONE suite into its EX Series machines. Used in tandem with its own internal machine design packages, these capabilities enable PTG Holroyd to create a virtual 'digital twin' of each new EX Series rotor milling machine on the desktop,

before ordering components and commencing a physical build. Virtual rotors or worm helix profiles can be cut, all while observing entire simulated manufacturing cycles and testing safety and failsafe features.

"By first creating each customer's specific machine requirements virtually, physical build time is reduced something which, in turn, helps us to remain exceptionally competitive in these cost-conscious times," says Mark Curran. "The Sinumerik ONE software also makes acceptance testing incredibly straightforward, as our customers are able to sign-off on their new machine before it has even been built."

The PTG Holroyd EX Series of rotor milling machines

PTG Holroyd's EX range begins with the 2EX, a machine capable of milling helical components of up to 250 mm in diameter, and offers stepped increases in capability, right up to the 8EX, 850 mm maximum component diameter, rotor milling machine. There are also models with the additional capability to mill Roots-type blowers.

EX machines cut a full-depth groove by

traversing the cutting tool through the material at the relevant helix angle, whilst at the same time rotating the component in the 'C' axis. Accurate synchronisation between the axes is maintained via the Sinumerik ONE CNC, with digital drive technology controlling all axis movements. The cutting head is able to remove so much material in one step because the majority of heat generated is transferred to the swarf chips. These are then removed from inside the machine by means of a conveyor system.

Extremely flexible in their manufacturing capabilities, EX Series machines are equally efficient at producing complex components with helical screw profiles, as they are when milling gear parts such as worm shafts. Developed to improve productivity through a combination of high-speed operation, powerful menu-driven touchscreen, quick-change tooling, high-power spindles and immense rigidity, EX Series machines benefit from advanced technologies such as on-machine probing and dry milling techniques for certain materials.

Incorporating the brands of PTG Holroyd, PTG Powerstir™ Friction Stir Welding and Holroyd Precision Rotors, PTG has

established itself at the forefront of high-precision machine tool design, build and supply for specialised applications. The range includes advanced machine tools for the production of complex helical components such as compressor rotors, screw pumps and high-accuracy gears, and Powerstir machine tools for friction stir welding advanced alloys used in transport applications. With production facilities in the UK, USA and China, Holroyd Precision Rotors manufactures the special purpose, ultra-precision helical components used in a wide range of industries, including refrigeration, air-conditioning, gas and vacuum pumping, industrial air handling, aerospace, medical equipment, motion control, power transmission, power generation, oil & gas, fluid transfer and high-end automotive. PTG also provides advanced technical consulting services.

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Parts cleaning for multiple tasks along the process chain at parts2clean 2023



As a key component of manufacturing processes, parts cleaning ensures the quality and function of increasingly compact and complex products. The required technical cleanliness, however, cannot be generated with just a single cleaning step at the end of the process chain. Instead, it needs to be performed along the entire chain.

The exhibitors at parts2clean will provide information about the different factors that need to be taken into account, at the same time presenting solutions for adapted, efficient and sustainable preliminary, intermediate and final cleaning. The supporting program at the 20th edition of the leading international trade fair for industrial parts and surface cleaning, taking place from 26th-28th September at the Stuttgart Exhibition Centre in Germany, will also impart substantial know-how and expertise in the field.

Components for innovative products are becoming increasingly compact and complex in virtually all sectors of industry. At the same time, the demands on the performance and reliability of products are increasing. This results in a significantly higher sensitivity of the parts to contamination and machining residues from the production process. The particulate and film cleanliness required for high quality and the safe functioning of the products can thus not be achieved with just a single cleaning step at the end of production.

Rather, it is necessary to evaluate each processing step, for example milling, forming, coating or assembling, with regard to its influence on the technical cleanliness of the entire product. "The tasks in parts and surface cleaning have not only become more diverse in recent years, but also more demanding," reports Christoph Nowak, project director at Deutsche Messe AG. "For the changed spectrum of tasks, exhibitors at parts2clean will present future-oriented solutions optimally adapted to the respective production step, component geometry and material, as well as contamination and cleanliness requirements. And that's regardless of whether it's a matter of preliminary or intermediate cleaning or final cleaning." This approach ensures that the required results are achieved in a stable, efficient and sustainable manner, even in high-purity cleaning applications, such as those found in the semiconductor supply industry, medical technology, sensor technology, electronics, aviation and aerospace, plus a range of electromobility areas.

Everything for process-secure, efficient and sustainable cleaning

parts2clean features every segment of industrial parts and surface cleaning,

including all the relevant suppliers. The range of products and services includes equipment, systems, media and process technologies as well as containers and workpiece carriers for fluid-based processes and energy-efficient drying as well as solutions for water treatment and bath care. This also includes options for optimising existing processes and designing them to be more energy-efficient. Technologies for dry cleaning will also be presented, for example CO₂ snow blasting, plasma, laser, vibration, compressed air and vacuum bakeout processes. Other areas include the control, monitoring and inspection of cleaning, rinsing and drying processes, as well as the achieved cleanliness. Innovative solutions will also be presented in the segments of cleaning automation, including parts handling and, for the digitisation and intelligent integration of cleaning processes, in connected production environments. Topics such as a cleanliness-compatible manufacturing environment, for example clean rooms, cleaning services and technical literature complete the range of offerings. "On the one hand, parts2clean offers cleaning technology users from product processing and the full range of manufacturing sectors a comprehensive



overview of development trends, technologies, procedures and processes that is unparalleled at any other trade fair in the world," reports Christoph Nowak. "On the other hand, the various products and services can be directly compared and solutions for individual tasks can be specifically discussed with the various suppliers."

Supporting program for knowledge transfer and know-how generation

In addition to the exhibitor presentations, the sophisticated supporting program offers visitors a wide range of information, impetus and valuable knowledge for designing cleaning processes that are future-proof and sustainable, adapted to the respective requirements. This includes the special show: "Technical Cleanliness", organised jointly with the CEC (Cleaning Excellence Centre).

In addition to presentations on current trends and developments and an exciting program of lectures, the German Industrial Parts Cleaning Association (FiT) will be presenting a highlight at its special show area: the presentation of the 2nd FiT2clean



Award. This annual award, which is endowed with 10,000 euros, honours outstanding achievements and innovative solutions in industrial parts cleaning.

The three-day integrated Expert Forum at parts2clean, whose technical coordination is being handled by the Fraunhofer Cleaning Business Unit and the FiT, is one of the most popular sources of knowledge internationally. The simultaneously translated presentations delivered by high-ranking experts from industry and associations, as well as from science and

research, offer a wealth of information on basic principles, solutions for optimising cleaning processes, various developments and trends in industrial parts and surface cleaning, as well as on benchmark applications in selected industries and innovations in cleaning technology. Participation in the Expert Forum is free of charge for parts2clean visitors.

Deutsche Messe

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www.parts2clean.de/en

MecWash Systems expands presence in the USA through distributorship with AQUASGROUP

MecWash Systems is pleased to announce its new distribution partnership with AQUASGROUP in the United States. Based in East Providence, Rhode Island, AQUASGROUP will serve as the exclusive distributor of the MecWash Systems line of high-performance component cleaning systems in New England, as well as New York and Pennsylvania. Additionally, AQUASGROUP will provide complete technical support for MecWash Systems customers in these eight states. Founded more than 35 years ago, AQUASGROUP is a chemical engineering-based designer and manufacturer of process water purification, treatment and recycling systems under its trademark Green Factory Series line of equipment. AQUASGROUP also manufactures its trademark Oasis Series Zero Liquid Discharge (ZLD) precision cleaning and metal finishing lines of equipment.

Established in 1993, MecWash Systems specialises in the design and manufacture of high-performance aqueous parts cleaning

systems for metal and plastic machined components. MecWash's MWX range include ultrasonics and vacuum drying for components with complex geometries that have stringent cleanliness requirements.

In early discussions about a possible partnership, the principles at MecWash and AQUASGROUP discovered how aligned they are regarding closed-loop usage and recycling of water to clean components in industrial applications. Furthermore, each company's target markets of aerospace, medical, hydraulics, automotive, electronics and precision engineering overlay almost identically. Hence, this partnership will prove beneficial for both companies immediately and into the future.

Bill Westbrook, North American operations manager for MecWash Systems, says: "This is a fantastic move for both MecWash Systems and AQUASGROUP. The partnership provides us with widespread sales coverage in the Northeast of the country with excellent technical support for our customers after the sale. The New England market is one that we have wanted



to enter for some while. Our new partnership with AQUASGROUP now gives us this opportunity."

John Pattison, managing director for MecWash systems, comments: "The American market is performing well with parts washing machines being delivered to customers from across the manufacturing sectors. New England, New York, and Pennsylvania represent some of the key areas for manufacturing in America and we look forward to seeing the results that the partnership with AQUASGROUP brings in the coming years."

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ActOn Finishing offers mirror finishing solution to UK manufacturing market by acquiring the DLyte PRO500

ActOn Finishing is an established brand in the surface finishing UK market. With more than 50 years of experience in developing mass finishing, shot blasting and wastewater treatment solutions for a wide range of industries, the surface-finishing manufacturer is looking to introduce more efficient machinery into its range every year. This year ActOn has introduced in its range the DLyte PRO500.

The DLyte PRO500 offers exceptional metal surface-finishing results with superior speed and efficiency replacing manual finishing. ActOn can supply this machine or offer a subcontract finishing service.

Sid Gulati, managing director at ActOn Finishing, states: "We are very pleased with our latest addition to our test lab. We currently manufacture all surface finishing machines in the UK and adding the DLyte PRO500 will complement our current

offering as we look to grow the business. We are confident that through this collaboration we can offer an advanced process solution and help our customers overcome challenges in finishing their components."

Why DLyte PRO500?

The DLyte® PRO Series has been designed to include the largest compact dry electropolishing machines for industrial applications. Some of its main benefits include:

- provides a solution to materials such as steel, cobalt-chrome, titanium, copperbased, nickel-based and aluminium alloys.
- the polishing action reaches every corner of the piece, so it can process inner cavities which cannot be accessed mechanically.
- the DLyte PRO500 is equipped with two, four, and eight perimeter spindles. This



versatile configuration allows it to efficiently manage single or multiple workpieces per holder. This not only boosts its overall capacity and performance but also makes it exceptionally effective when dealing with substantial workpiece quantities.

- achieves homogeneous polishing across the entire surface of the piece is the main advantage compared to mechanical polishing.
- doesn't generate grinding texture patterns, improving resistance to part wear and fracture resistance, improving the bearing ratio, an improving fatigue resistance.
- achieves Ra's under 0,09 micrometres.
- offers controlled costs and predictable lead times.

DLyte PRO500 combines easy operation, advanced automation, and intelligent software to deliver superior finishing results. With real-time parameter optimisation based on conductivity and temperature control, it maintains electrolyte quality and extends its lifespan, ensuring consistent and repeatable performance between cycles.

The specialised workpiece holders and fixtures are designed to optimise results for each piece's unique geometry and finishing requirements. The versatile holding systems ensure maximum capacity utilisation across various applications, making it the ideal solution for companies of each sector. Moreover, DLyte PRO500 connects to the DLyte HUB to access all services required for high-quality finishing. This allows users to monitor the process,



receive real-time system status updates, track maintenance schedules and download and update surface finishing programs.

Sid Gulati, managing director at ActOn Finishing, says: "We are continuously developing and adding new products to our range of finishing solutions and are certainly excited with the new DLYte PRO500 technology. ActOn are here to offer you a complete solution."

To learn more about ActOn's technology and surface finishing process, contact the team at sales@acton-finishing.co.uk. You can also request a free trial here:

<https://actonfinishing.co.uk/free-trial/>



Ultrasonic cleaning machines and how they work with ActOn finishing

Put simply, ultrasonic cleaning is a process that uses high-frequency sound waves, beyond the upper limit of human hearing, typically above 20,000 hertz, through a liquid to perform various functions and finishing applications. These sound waves are generated by ultrasonic transducers, which are devices capable of converting electrical energy into mechanical vibrations.

How does ultrasonic cleaning work?

The cleaning process works by creating ultrasonic waves that are sent through a liquid cleaning solution, causing the formation and collapse of millions of tiny bubbles. This process, called cavitation, creates intense pressure and temperature changes, which effectively loosen and remove dirt, grease and other contaminants from the surface of the object being cleaned.

What can ultrasonic technology clean?

Ultrasonic cleaning machines work on a wide range of different materials, meaning they can be used across a variety of different industries. There's a few things to consider when choosing the right ultrasonic cleaning machine for your business, such as:

Application

Determine the intended use of the ultrasonic machine. Are you looking for a machine that can help with medical imaging, industrial cleaning, laboratory research, or another specific purpose? Different applications may require different features, frequencies and power levels.

Frequency

Ultrasonic cleaning machines operate at specific frequencies, typically ranging from a few kilohertz to several megahertz. Higher frequencies provide finer detail but have limited penetration, while lower frequencies offer deeper penetration but lower resolution. Choose a frequency that suits the specific application and the type of material you'll be working with.

Power and intensity

Consider the power output and intensity requirements of your application. Higher power levels and intensities are typically needed for industrial cleaning or cutting applications, while medical imaging may require a different range of power.

Controls and features

Evaluate the control options and features provided by the ultrasonic machine. Look for machines with user-friendly interfaces, intuitive controls and adjustable settings for frequency, power, and time. Additional features like timers, programmable settings and temperature control can enhance functionality and convenience.

Size and capacity

Consider the size and capacity of the ultrasonic machine. Ensure it can accommodate the size and quantity of objects or materials you plan to work with. For industrial applications, choose a machine that has an appropriate tank size to fit the parts you need to clean or process. ActOn ultrasonic cleaning machines come in various sizes, consider how large the parts you will be cleaning are to ensure you get the right size.

Custom made machines


ActOn provides custom made ultrasonic machines designed to suit your specific needs. Check out our brochure to discover our range of ultrasonic machines.



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More sustainability in the field of surface finishing with dry electropolishing

The field of surface finishing is characterised by demands for higher quality with, at the same time, an increasing need for process consistency, traceability and resource efficiency.

Frequently, this requires new finishing methods. With the DryLyte system Rösler Oberflächentechnik offers an innovative system for electropolishing metal components that must have a perfect finish. Contrary to classical electro-chemical polishing methods DryLyte is a dry process that utilises solid particles containing electrolytes. Acid baths or other process liquids are completely eliminated. Benefits of this revolutionary technology include an excellent surface finish, a high geometrical consistency of the workpieces, a lower CO₂ footprint and lower costs for waste disposal. The costly and complex treatment of used process liquids is eliminated and the finished workpieces are discharged from the system perfectly clean.

Whether for cosmetic or functional reasons, the providers of surface finishing solutions are confronted with numerous challenges. On the one side demands for lower surface roughness values and geometrical consistency of the finished work pieces must be met, whereas on the other side the finishing processes must be cost-efficient and eco-friendly. Issues such as energy requirements, consumption of valuable resources, prevention of potentially hazardous substances and waste disposal are becoming more important. In addition, the customers are demanding absolutely consistent results and processes that can be perfectly reproduced. All these requirements can only partially be met with manual finishing or traditional electropolishing methods with liquid electrolytes. With its innovative DryLyte polishing technology GPA Innova, a partner of Rösler Oberflächentechnik, offers an excellent method for finishing geometrically complex components made from conductive metals.

Sustainable and highly efficient technology

The fully automatic DryLyte system simplifies and helps standardise different surface finishing tasks such as deburring,

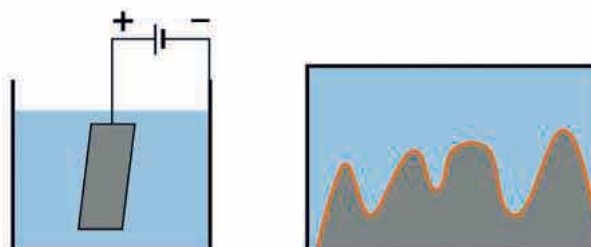


surface smoothing, surface grinding, high gloss polishing and, even, post processing of 3D printed components. Depending on the initial surface conditions and the specified finishing results, dry electropolishing can be utilised as stand-alone process or in combination with known mass finishing, shot blasting and other pre-grinding methods.

The DryLyte technology is based on the principle of electro-chemical material removal from the surface of components. However, the technology does not use liquid electrolytes but a multitude of polymer pellets in different sizes containing electrolyte media that are precisely adapted to the respective finishing task. In contrast

to the traditional electropolishing systems, no hazardous vapours are generated requiring energy-intensive exhaust systems and special protective gear for the operator(s). Since the material removed from the workpiece surface is absorbed by the electrolyte medium, no dust or metal particles are getting into the environment, as happens with manual grinding and polishing operations. High-quality, consistent processing results are achieved throughout the usable life of the electrolyte medium. This must only be replaced once the dry electrolyte has been saturated with the metal removed from the workpiece surface. The waste disposal of the saturated electrolytes is similar to the disposal of

Conventional Electropolishing



- + All surface contacts liquid
- + General oxidation
- + Low discrimination

grinding media. The saturation rate is monitored by the machine so that the operator is always up-to-date and informed about the remaining usage time. This guarantees absolutely stable and consistent finishing results and the optimal utilisation of the electrolyte. It also helps minimise the costs for labour and waste disposal. Finally, because of the efficient resource utilisation, the CO₂ footprint is reduced.

A precise and gentle finishing process that maintains the geometrical integrity of the workpieces

During the dry electropolishing process the workpieces, mounted to a fixture, are slowly moving through the dry electrolyte. This ensures complete coverage of the entire surface. If required, internal surface areas can also be finished by using special electrodes. The DryLyte method removes primarily the roughness peaks from the surface. Therefore, the metal removal rate is minimal and the overall process is very gentle. The finished workpieces have a highly homogeneous surface with no pressure points or an orange peel effect. Even in the case of delicate workpieces with complex shapes, no damage in the form of scratches or breakage occurs.

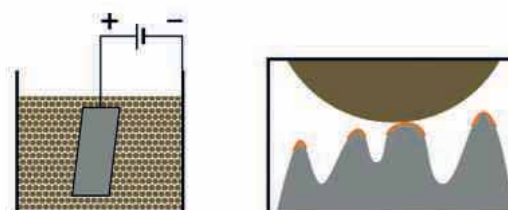
The targeted and "controlled" processing ensures that in the case of precision components like machining tools or tools for the pharmaceutical industry, their geometrical integrity is not affected and their edges are not radiused. In addition, the highly effective smoothing effect on the surface prevents micro cracks and pitting. This improves the corrosion resistance and "fatigue" characteristics and, thus, extends the usable life of the components. Compared to components treated with traditional electropolishing, dry-electropolished components corrode 4 to 15 times slower as proven in corrosion tests in a saltwater solution containing 30 grams/liter NaCl. In the case of gear components used in mechanical systems, dry electropolishing increases the material load ratio, reduces friction and guarantees the optimal distribution of lubricants on the workpiece surface. The improved surface conditions result in a lower wear rate and, at the same time, reduce the noise level.

Another significant benefit of the DryLyte technology is the relatively short cycle times. Depending on the finishing application, initial surface roughness and required results, they can vary between a few minutes and 1.5 hours. The process creates not only a smoother surface but, if needed, it can also produce a high gloss polish in one single process. For post processing of 3D printed components with their typically very high surface roughness, the electropolishing operation is preceded by a mass finishing process utilising abrasive grinding media.

Easy adaptation to many finishing applications

The unique, patented dry electropolishing technology was initially developed for finishing prototype castings and dental crowns made from cobalt chrome and titanium. In the meantime the dry electropolishing method from GPA Innova is used for finishing stainless steel, steel, hard metals as well as nickel, aluminum and copper alloys along with other conductive metals. Today the process is used whenever high finishing qualities are required in industries such as aerospace, pharmaceutical, machine building as well as luxury and consumer goods. Because of the proven biocompatibility of the finished components, dry electropolishing is also used in medical engineering for the production of implants and instruments.

DryLyte Technology



- + Spheres contact on roughness peaks
- + Localized oxidation
- + Selective removal of metal

Process development and definition of the process parameters for the respective finishing application takes place in the customer experience centre at Rösler. For this purpose, the CEC is equipped with different machine types allowing fully automatic operation. This approach guarantees that the finishing processes for the customer components are always based on precisely defined and validated parameters.

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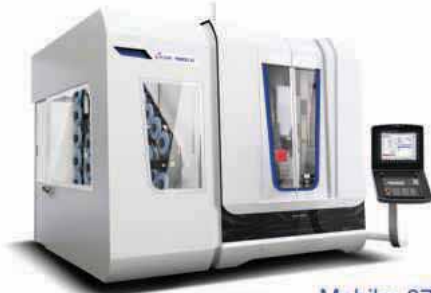
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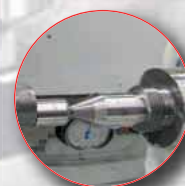


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