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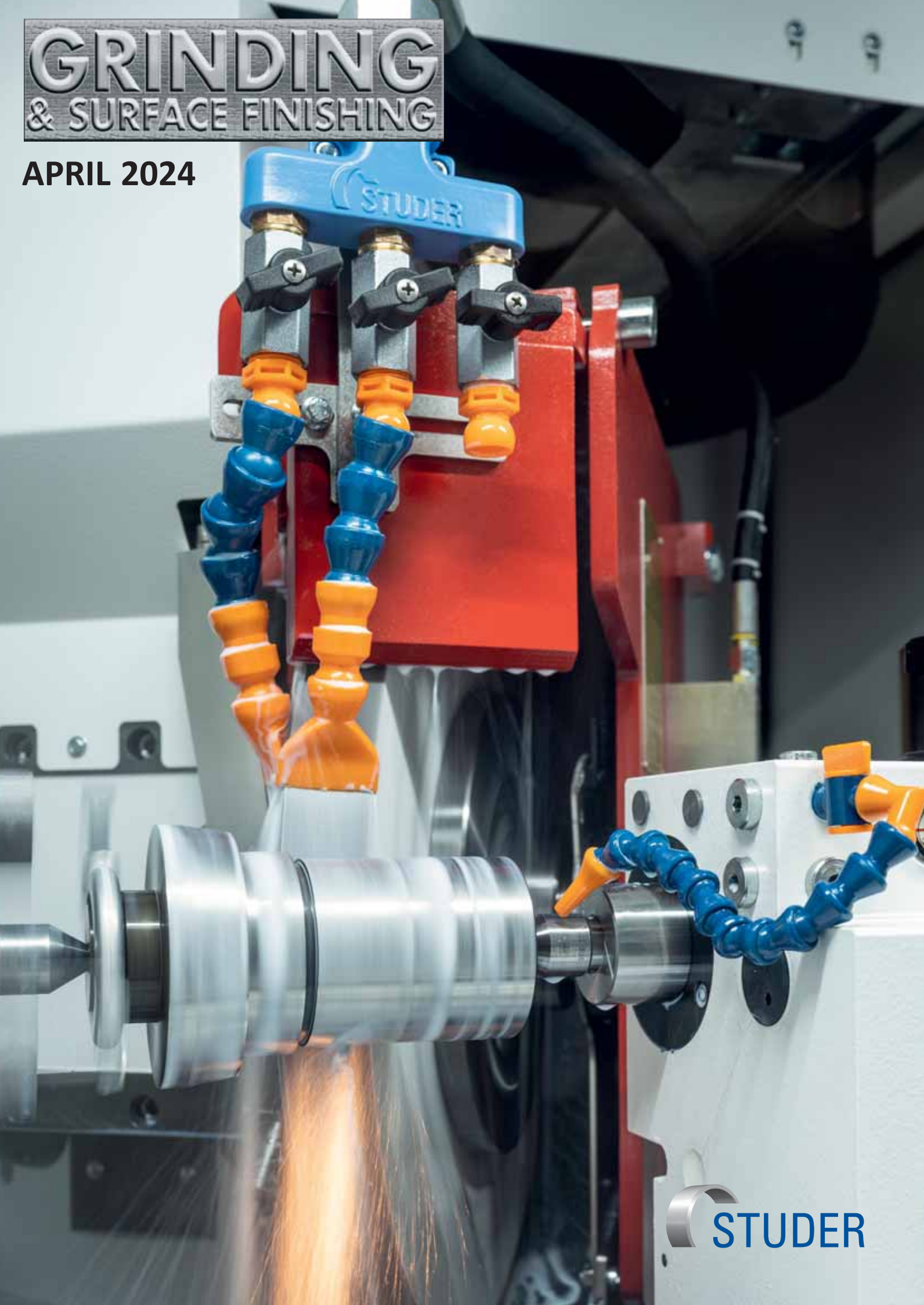
APRIL 2024



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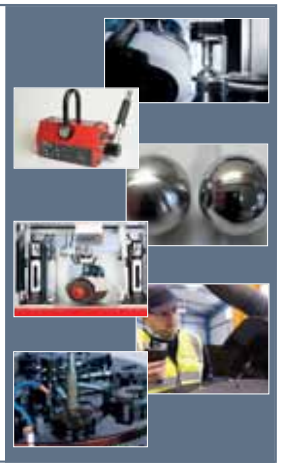

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Swiss quality as a price leader

STUDER emphasises its commitment to providing high-quality precision machinery at competitive prices with its entry-level range. Sandro Bottazzo, CSO of STUDER, highlights the philosophy behind these machines as providing "uncompromising STUDER quality and precision at an entry-level price." These entry-level models include the favorit, favoritCNC, and S100, which cater to various grinding applications with streamlined features and standardised interfaces.

Daniel Huber, CTO of STUDER, explains that, while entry-level machines offer a limited number of tools and range of spindle power compared to high-end models, they still offer excellent value for money. Optional accessories and adaptations further enhance efficiency, ensuring suitability for diverse production needs. With knowledgeable sales staff guiding customers, STUDER ensures the optimal configuration for each application.

Customers benefit from competitive pricing without compromising on quality, reliability, or precision. STUDER's entry-level machines uphold the brand's reputation for performance and offer short delivery times due to efficient in-house manufacturing processes. This combination of affordability and quality appeals to businesses like Celikis, an automotive supplier in Turkey, that experienced significant productivity gains with the favorit model.

The favorit and favoritCNC models exemplify versatility, with the ability to grind various workpieces efficiently. Made of high-quality materials such as Granitan®, these machines ensure precise results even in entry-level categories. Intuitive programming and advanced software simplify complex grinding tasks, enhancing usability and efficiency.

The S100 specialises in internal cylindrical grinding, complementing external grinding capabilities of other models. With multiple grinding spindles and QuickSet for rapid setup, it offers high accuracy and reduces setup costs. Ergonomic design and intuitive controls facilitate ease of use, crucial for entry-level operators.

STUDER recognises industry challenges such as labour shortages and an ageing workforce. By providing user-friendly machines with intuitive software, it empowers operators to achieve high-quality results with minimal training. Automation features, such as standardised loader interfaces, further enhance efficiency and integration into automated production processes.

As industries evolve, STUDER remains committed to providing innovative solutions that balance affordability, quality, and efficiency. By understanding customer needs and leveraging advanced technology, it continues to set benchmarks in the grinding machine industry, ensuring Swiss quality remains accessible to all.

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GrindingHub: Hall 9 - Stand: C51.4

STUDER stays on song

Annual Motion Meeting in Switzerland outlines the company's success and latest developments

Despite a globally challenging investment environment, the manufacturer of precision cylindrical grinding machines was able to increase its sales and gain market share in many regions.

This year's press conference of Fritz Studer AG was under the motto the "Sound of Studer". "The recently completed fiscal year 2023, notably the year of our 111th anniversary, was extremely successful," said STUDER's CEO, Jens Bleher, in front of 65 journalists from over 20 countries in Steffisburg, Switzerland. Despite the globally challenging investment environment, the manufacturer of precision cylindrical grinding machines was again able to increase its sales. Especially in key markets like the USA and China sales developed positively. Asia was, as in previous years, the largest single region followed by Central Europe and North America.

Consistent investments in product development and site infrastructure have paid off. "We have turned our announcements into reality and used the time to improve our market position and strengthen ourselves for the future in the long-term," Jens Bleher said. STUDER was able to gain market share in many regions of the world. Moreover, the new sales record in the Customer Care segment was very pleasing. Jens Bleher took it as a positive sign for the upcoming fiscal year that the order situation developed exceptionally well towards the end of the year.

Although the development of incoming orders was weaker in individual markets, such as Germany, China, and some Asian countries, other parts of the world saw positive results. "We achieved good results in many countries and even posted a new record order intake in some," said Sandro Bottazzo, CSO at STUDER.

Measured by customer segments, the aerospace industry once again generated the largest increase in new orders. This industry has now overtaken the declining automotive and supplier industry. The "Tool" segment remained below expectations. The largest individual segment, as in the prior year, is precision engineering, which is dominated by contract manufacturers. "I am very pleased that our grinding machines are so highly trusted by small and medium-sized enterprises and that this segment remains strategically important for us," explained Sandro Bottazzo. The mechanical engineering and die & mould segments also maintained their important positions. Additionally, the increasing demand for precision cylindrical grinding machines in the semiconductor industry was very pleasing.

For STUDER, an internationally positioned manufacturer of precision cylindrical grinding machines, maintaining a broad portfolio remained of particular importance in 2023. Incoming orders for CNC universal cylindrical grinding machines were very solid. The machine with the highest volume was the S33, followed by the favoritCNC, the S31, the S41 and the favorit.

"When it comes to internal cylindrical grinding machines, it was the third-best year for incoming orders in the company's history for the S131," said Sandra Bottazzo. Orders for the new S100 internal cylindrical grinding machine were also very pleasing and exceeded targets.

Customer Care developed very positively. "Here we were able to set a sales record for the second consecutive year," said Sandra

Bottazzo. This applies to all business areas: from maintenance and service to spare parts and overhauls. Particularly pleasing was the development in Eastern Europe, where Studer now performs service with its own skilled personnel in the Czech Republic, Slovakia, Poland and Hungary.

Globally, STUDER participated in about 30 trade shows and Open Houses. In addition to CIMT in Beijing and EMO in Hannover, the open house at UNITED GRINDING North America was particularly successful. At EMO 2023, the company was able to present at one trade show three automation solutions for the first time in its history with the new insertLoad loader as well as the roboLoa and uniLoad.

Important developments in spindles and automation

In 2023, the focus for STUDER remained on the development and advancement of state-of-the-art grinding technologies for the benefit of its customers. The S36 production external cylindrical grinding machine is particularly suitable for components related to e-mobility. "Now our customers can use all spindle variants and automation solutions without restrictions on the S36," said CTO Daniel Huber. Thanks to the new, powerful grinding spindle with 25 kW, 33 hp, it is possible to use particularly wide grinding wheels up to 160 mm, 6.3 inches. A new option is high-speed grinding with CBN or diamond grinding wheels. With the fully compatible easyLoad and uniLoad loading systems, customers can highly automate their production with the S36.

Daniel Huber was pleased with the success of the new S100 internal cylindrical grinding machine. It has established itself in the entry-level segment for internal grinding, analogous to the favoritCNC in external grinding. Thanks to last year's development, the S100 now has a new, powerful dressing spindle, Ø 58, which is also planned for further models in the future.

Customers can eagerly anticipate new features in the successor machine to the popular favoritCNC: for example, an angle display of the wheelhead, the popular QuickSet setup function and a conventional mode as a manual grinding cycle that efficiently allows for the manual grinding of workpieces without any programming.

New features announced for C.O.R.E.

A particular focus in development in 2023 was also on C.O.R.E., the revolutionary hardware and software architecture of United Grinding. "The C.O.R.E. touch operating panel already allows an unprecedented level of intuitive use and soon there will be a customisable inter-face, where operators can define and save their workspace," explained Daniel Huber. Data collection and analysis, as well as new sensors and instruments, were also a focus.

Daniel Huber then provided an outlook for the future: "The issue of sustainability continues to be important for us." The SmartJet® cooling system developed by Studer, already significantly reduces the need for coolant and energy in the grinding process, setting new industry standards. Daniel Huber also sees great potential in the semiconductor industry. Demand for high-performance semiconductors is rising due to e-mobility and photovoltaics. Studer's S41 CNC universal cylindrical grinding machine with in-situ X-ray measuring head sets the standard in wafer manufacturing and is extremely successful in the market.

He stated: "In the long term, only the machine manufacturers who offer intelligent and efficient machines incorporating the latest technology can be successful."

Stephan Stoll, COO of STUDER, said: "The production-mix of the machines manufactured has shifted to more complex systems in 2023." Due to active procurement management and the normalisation of global supply chains, orders were completed on time. He positively assessed the implementation of the joint production strategy within the United Grinding Group, which provided STUDER with good utilisation.

Key operational projects included investments in automated manufacturing tools and state-of-the-art test stands. STUDER is one of the few grinding machine manufacturers to produce its own high-quality spindles. The expertise for these strategically important machine components was specifically expanded. Comprehensive structural and logistical measures were further invested in Steffisburg and in the internal grinding competence center in Biel for these prerequisites and further growth.

Sustainability also played a significant role. "Since February 2023, the Steffisburg site has been connected to the local district heating network, thus heating all buildings in an environmentally friendly way," explained Stephan Stoll.

Furthermore, the conversion of all buildings to LED lighting is largely complete. Overall, energy consumption and CO_2 emissions have significantly decreased.

Stephan Stoll also gave an outlook for the coming fiscal year: "After the considerable investments of the past years, the redesign of our logistics processes and warehouse infrastructure is now imminent." The centrepiece of this project is a central logistics hub with a directly connected container warehouse. The higher efficiency of the fully automated warehouse system benefits the entire machine production and the handling of spare parts.

In conclusion, Jens Bleher emphasised the great importance of well-trained employees for the technology company. He was very pleased with the recent successes at the prestigious professional championships, SwissSkills. Last year, STUDER apprentices Luis Salzmann and Noah Rossel won gold and silver medals with their outstanding performances. "STUDER is represented for the third time in a row at the WorldSkills. We are very proud of this, which confirms our extensive commitment to vocational training," said Jens Bleher.

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GRINDING HUB
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Shining the spotlight on grinding technology

GrindingHub is set to open its doors for the second time to grinding experts from all over the world from 14th to 17th May. Over 460 exhibitors from 31 countries will be presenting their latest grinding technology solutions in Stuttgart, Germany with the exhibition now taking place in four exhibitions halls for the first time.

The event will be about more than just technical products and innovations, as Dr Markus Heering, managing director of the organiser VDW (German Machine Tool Builders' Association), reports: "Automation and digitalisation, skills shortages, new customers and markets, the promotion of young talent; the industry is facing multiple challenges and opportunities. As the meeting place for the grinding technology industry, we want to offer the community a platform for swapping ideas and picking up information. I am convinced that we will succeed in this, thanks to the increased number of exhibitors, the impressive supporting program and the international and sectoral diversity which is now even greater."

The trade fair concept expands the tried and tested elements but also breaks new ground. The latest trend topics are presented in the GrindingSolutionPark Science and in the Startup Hub: The overall concept establishes close links between business and research. It is important to include smaller companies and start-ups in the industry get-together. This is why the Startup Hub was created, offering ideal conditions for innovative companies. For the first time, there will also be a joint stand for Swiss companies. This market is particularly important for grinding technology and its exhibitors will now have the opportunity to get a taster of the GrindingHub and present their products and services to the visitors under their national banner.

A further focal point will be on digitalisation in production. This includes a

further live demonstration of umati, the joint interoperability initiative of the VDW and VDMA for global data connectivity. Numerous exhibitors will be connected to the umati dashboard and will be recognisable by the distinctive sticker on their machines.

GrindingHub is keen to address the needs of the next generation and emphasise how it is combatting the shortage of skilled workers and promoting young talent with the "Grinder of the Year" competition. It will put the theoretical knowledge and practical grinding skills of young talents from Germany, Austria and Switzerland to the test.

"We are particularly pleased to be presenting even more aspects of the grinding process chain than in the first event. More exhibitors, greater internationality and more product diversity. There is clear growth in all key areas compared to the premiere in 2022," says Martin Göbel, head of trade fairs at the VDW. A total of 461 exhibitors had registered by February 23, 85 more companies than in 2022. The number of companies and the amount of exhibition space they have booked have made it necessary to open a fourth hall. The exhibitors are spread across 40 sectors, from grinding, polishing and honing equipment through to cylindrical and non-cylindrical grinding machines, cooling and lubrication. In the grinding, polishing and honing products segment, the organisers have registered almost 120 percent growth. The top five sectors include cylindrical and non-cylindrical grinding machines, grinding machines for the cutting and machining of tools, machines for lapping, polishing and honing as well as surface grinding machines.

Grinding is a key metalworking process that comes at the end of almost every process chain, ensuring a precise surface finish and dimensional accuracy. Accordingly, grinding technology plays a decisive role in determining the durability and functionality of a wide range of end products. Grinding technology is also particularly important for energy efficiency as a result of lower energy losses and for environmental friendliness due to the reduced emissions.

Dr Markus Heering concludes: "At GrindingHub 2024, trade visitors will once again be able to experience the entire world of grinding technology live and at first hand. The trade fair reflects the internationality and diversity of the industry and thus offers an excellent opportunity to forge contacts across national borders and tap into new markets."

Further information is also available on the GrindingHub homepage at ***www.grindinghub.de***

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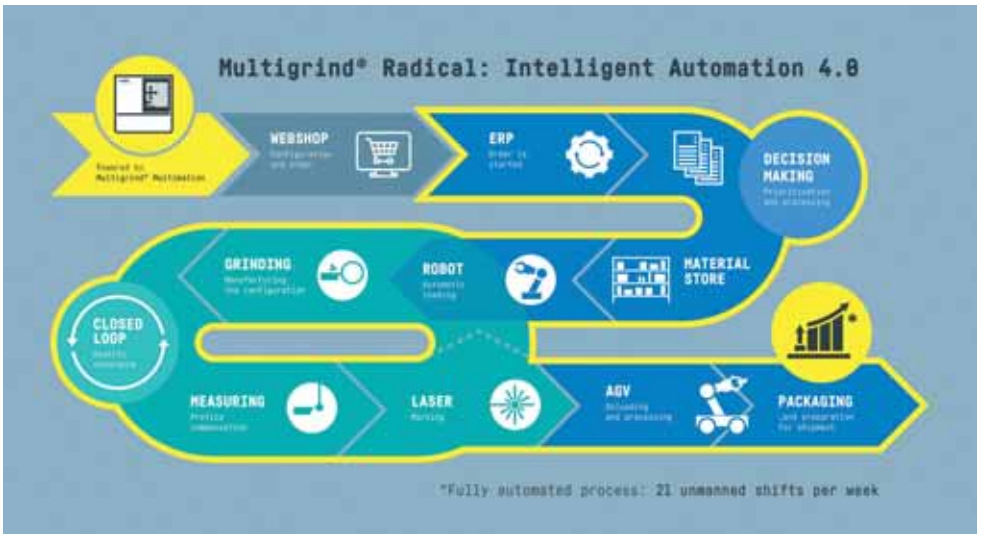

Over the last few years, Adelbert Haas has put a wide variety of turnkey solutions into operation. The basis for this is based on nothing less than the perfect interplay of hardware and software. The key words behind these turnkey solutions are: highest productivity and flexibility with maximum precision. Turnkey grinding is no longer enough.

With the Multigrind® Radical, Adelbert Haas is continuing this tradition and bringing the future of tool grinding to life at GrindingHub. A visit to the stand in Hall 10 is well worthwhile. The core topic of the precision specialists: the end-to-end digitalisation and automation of manufacturing processes.

Adelbert Haas has some ground-breaking innovations at the start. First and foremost the Multigrind Radical in fully automatic mode. Intelligent Automation 4.0: not a theoretical approach, but applied reality. With productivity that deserves the label quantum leap. Needs-based production simply directly from the web store via the ERP system to dispatch, without any major programming effort. The core element here is the Multigrind Radical, which grinds high-precision tools in unmanned operation thanks to Closed Loop. Thanks to intelligent automation, 21 shifts are completed every week, with minimal effort required for preparation and post-processing. The individual production steps are controlled by the Multigrind® Multimation software. Machine operation and machine control are possible at any time, from anywhere and from any device, because every Multigrind Radical is always online. Maintenance is carried out proactively based on the analysis of the machine data. As a result, there are virtually no machine downtimes and non-productive times are so minimal that they are no longer relevant.

The Multigrind Radical forms the heart of intelligent Automation 4.0. The technical peripherals are precisely controlled within the overall process. All individual production steps are connected, coordinated and controlled via Multigrind Multimation. The closed-loop grinding process ensures self-referential optimisation. The perfect tool leaves the grinding machine independently and is ready for dispatch in its packaging. The follow-up order is already in production at this point.

The precision specialist from Trossingen will also be demonstrating that performance results from the perfect interplay of hardware and software on its tried-and-tested all-rounders and problem solvers. Also on show the Multigrind® CB and Multigrind® CA. The performance of the universal grinding machines will be demonstrated by the production of rotors, which will be ground live under oil at the trade fair stand in Stuttgart.

Formerly Haas Schleifmaschinen GmbH, Adelbert Haas GmbH represents the business development that benefits both its existing and potential customers. The Trossingen-based company doesn't just build grinding machines, it develops unique technologies based on its solution expertise.

With the company's own software playing a decisive role in the requirements of the future. Adelbert Haas is both a hybrid and unique in the industry. On the one hand, it is a pioneer with solutions that reach outside the specific tool grinding market.

With its Multigrind® Styx software, it can visualise and optimise complete production processes before the workpiece to be ground is even clamped into the machine. This digital test bed for 3D optimisation offers, with its 1:1 visualisation, maximum control, pixel-perfect and without restriction. This saves a lot of time and unnecessary grinding of expensive blanks. It doesn't take much imagination to envision what this technology could do in related industries as well.

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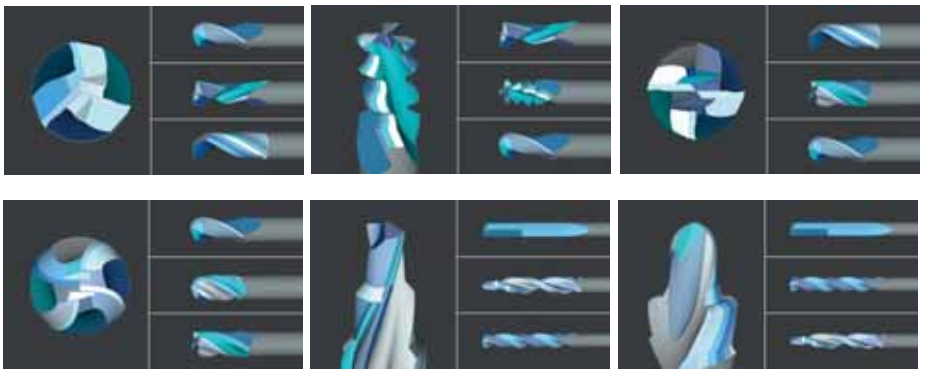
Hall 10 - Stand: C50



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UNITED GRINDING presents innovation at GrindingHub

The UNITED GRINDING Group will once again be represented with a prominent booth at GrindingHub under the motto "Stay Connected". This year, the Group will be unveiling an innovation in the field of tool machining from its Walter brand on the first day of the trade show, 14th May at 10 am in Hall 9, booth C51.

At GrindingHub, the UNITED GRINDING Group will be presenting the latest technologies from the fields of grinding, eroding, measuring and additive manufacturing with 12 machines. The motto of this year's trade show appearance is "Stay Connected" and therefore the focus is on connectivity solutions, which will be presented on 840 sq m.

In addition to digital assistance systems, the UNITED GRINDING Digital Solutions™, interested visitors can find out about digital Customer Care solutions or how machines can be connected with each other and with their production environment via the universal manufacturer-independent umati data interface.

Along with Walter machines for tool machining, machines from the Studer brand in the field of cylindrical grinding and Blohm in the field of surface and profile grinding will be on display. The group will also be presenting its additive machine tool for the industrial 3D printing of metal parts, the IMPACT 4530, from its IRPD brand.

Visitors will also be able to see the intuitive machine operation for themselves at the C.O.R.E. panel and win a PlayStation PS5 in the process.

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.

The tradition of the group companies goes back more than one hundred years, during which more than 150,000 machines were manufactured and delivered throughout the world. This longstanding experience and broad technological expertise make the UNITED GRINDING Group a reliable and competent solution provider for complex manufacturing tasks.

The innovative technologies of the companies in the UNITED GRINDING Group have a broad range of applications, from single part production through to mass production, from small businesses to large corporations, and are used in a wide variety of industries. Key areas are the automotive and supplier industry, medical, aerospace industry, tooling, die and mould, transportation and heavy industry, machine manufacturers, energy and precision engineering.

Its motivation is for the success of its customers. The UNITED GRINDING Group's ambition is therefore to accompany its customers along their way and to provide its expertise as a strong and reliable partner to make them even better.

UNITED GRINDING's service includes consulting and selecting the appropriate machine and the most efficient machining process, timely delivery and commissioning of a high quality precision machine, reliable customer support throughout the life cycle of the machine with customer training, professional maintenance, expert after-sales service, global aftermarket service, efficiency enhancement using UNITED GRINDING Digital Solutions™ and all the way to retrofitting or overhauling machines.

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Danobat to commemorate its 100th anniversary at GrindingHub

Danobat, encompassing three brands Danobat, Overbeck and Hembrug, will participate in the GrindingHub exhibition in Stuttgart.

This year is particularly significant for Danobat-Overbeck. The German manufacturer of high-precision internal grinding machines is celebrating its 100th anniversary. Originally founded by Gustav Overbeck as a precision engineering workshop in Herborn, the company has evolved from producing standard grinding machines to delivering customised solutions. Over the years, Overbeck has gained expertise, made technological advancements and adapted to emerging markets.

To celebrate all these years of history, Overbeck will be hosting a 100-anniversary party on May 15th at the GrindingHub exhibition.

Versatile and high-speed production external grinding machine

Danobat will present the LG-1000, a versatile and high-production external grinding machine, at the GrindingHub. It is equipped with two grinding wheels, each 450 mm in diameter, CBN technology and a 25 kW grinding spindle drive capacity.

The LG range is a versatile and flexible grinding machine. It is suitable for high-volume production as well as variable batch production runs. Its flexibility is achieved through various features, including a modular design, multiple wheel head configurations, integration capabilities with loading and unloading systems, and enhancements for fast changeovers.

The LG-1000, exhibited at the GrindingHub, is configured for EV rotor shafts. Danobat´s strong position in the automotive and e-mobility sector is backed by 70 years of experience, ongoing collaboration with end-users and involvement in numerous projects using both conventional and CBN technologies. This extensive experience has allowed Danobat to gain significant expertise in each technology and process for grinding emobility components.

High precision internal, external, radius grinding in a single setup

Overbeck will showcase the IRD-400, a versatile multitasking machine that performs multiple processes, internal, external, face and radius, with utmost precision. It is considered one of the most robust machines on the market, enabling manufacturers to meet the tightest tolerances and achieve the best surface quality.

The Overbeck machine is equipped with a steady rest, designed for workpieces up to 400/280 mm in length that require grinding across different areas in a single clamping.

For internal grinding of slender pieces, the steady rest provides rigidity and stability to the process, avoiding any potential flexing. The steady rest is just one option that can be incorporated into the IRD-400. This serves as a small illustration of the machine's flexibility, allowing it to adapt to any production requirement.

A wide range of clamping, dressing and measuring systems are also available. It has a direct-driven spindle turret with a 300° swiveling range and the capacity for up to four spindles plus one measuring probe. The B0 axis is designed to grind high precision parts with very precise shapes and surface finishes, including 3-axis interpolation with the X and Z axes to create part contours.

These strategies are a response to the growing demand for flexible grinding solutions highly valued in a volatile and fast-changing market.

Hybrid horizontal hard turning and grinding machine

The MTG-100, a hybrid fine hard turning and grinding machine developed by Hembrug, exemplifies how flexibility is not merely a feature of Danobat machines but ingrained in its organisational DNA.

This hybrid machine combines two finishing techniques in one machine and is designed for complex workpieces up to Ø380 mm in size that require sub-micron tolerances.

It delivers the best of hard turning and finish grinding: ultra precise accuracies, fewer required process steps, smaller footprint, 2 in 1 machine and minimal setup and changeover times.

It is equipped with the hydrostatic bearing system, developed in-house, leading to a completely wear-free platform and a consistent accuracy, even after 30 years.

The MTG-100 is also among the most accurate machines in the world, achieving form and dimensional accuracies of ≤ 2 µm, roundness of ≤ 0.5 µm and surface finishes of 0.1 – 0.2 µm (Ra).

Flexibility in this machine is achieved by including numerous machining capabilities, two machines in one, integration with automation systems and enhancements for fast changeovers, among others.

Easy to set up and changeover, the most suitable process can be used for each workpiece surface, switching easily between hard turning and grinding during the operation.

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Small but powerful

25 mm, the size of a two-euro coin, is the diameter of the new CBN grinding discs developed by Liebherr-Verzahntechnik GmbH specifically for machining critical component geometries with low tool overrun. They can be coated with specifically selected grain for longer service life and faster grinding processes.

Alongside diamond, Cubic Crystalline Boron Nitride (CBN) is one of the hardest grinding materials available. CBN grinding discs are suitable for the highest quality requirements because they are dressing-free, wear-resistant and heat-resistant. Liebherr has developed very small CBN grinding discs with a diameter of just 25 mms for gears subject to collision and with low tool overrun. The company is therefore extending the geometric process limits for internal and external gears with interfering contours.

CBN expertise at Liebherr

CBN grinding discs have a steel body, which is electro-plated with abrasive CBN grains. The basic steel body is break-resistant and can be reused several times. However, the manufacturing process is complex, especially when making very small discs. With more than 30 years of CBN expertise, Liebherr has the necessary know-how to manufacture the grinding discs completely in-house.

Optimised design

The smaller the discs, the more complicated they are to manufacture: "In this size range, the process has no margin for error," explains Haider Arroum, head of sales for gear cutting tools at Liebherr. "You also have to choose the right grain size to achieve the desired surface roughness of the workpiece while generating as little wear as possible, even at high rotary and cutting speeds." Liebherr's special design allows for shorter and more economical grinding processes.

Successful in the aerospace industry

The tiny discs are already being successfully used by Liebherr-Aerospace for profile grinding of small gears for planetary gear trains. "They're very happy with the results and, as expected, both the quality and the cost-effectiveness were excellent, an important factor in this area in particular," says Haider Arroum.

Liebherr develops and produces high-quality gear cutting machines, gear measuring machines, gear cutting tools and automation systems. The range includes gear hobbing, gear shaping, gear skiving, generating and profile grinding machines as well as chamfering and deburring machines. The measuring devices with software developed in-house stand for ergonomics, user-friendliness, precision, robustness, durability and service-friendliness. Liebherr is also one of the world's leading manufacturers of gear cutting tools and stock tools with long service life.

The range of automation systems ranges from linear robots and robot applications to conveying and storage systems through to solutions for pallet handling systems.

The Liebherr Group is a family-run technology company with a highly diversified product portfolio. The company is one of the largest construction equipment manufacturers in the world. It also provides high-quality and user-oriented products and services in a wide range of other areas.

The Liebherr Group includes over 140 companies across all continents. In 2021, it employed more than 49,000 staff and achieved combined revenues of over 11.6 billion Euros.

Liebherr was founded in Kirchdorf an der Iller in Southern Germany in 1949. Since then, the employees have been pursuing the goal of achieving continuous technological innovation and bringing industry-leading solutions to its customers.

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GRINDING HUB

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GRINDING HUB

May 14 - 17
Stuttgart, Germany
Hall 7, Booth B36

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‘Magnificent Seven’ for AGS

Seven of Advanced Grinding Solutions Principals are exhibiting at the GrindingHub event

Krebs & Riedel, founded in 1895, has been manufacturing high quality conventional, diamond and CBN abrasives for well over 100 years. It employs around 250 people and has a turnover of around £35m. It is constantly introducing new types of wheels with improved grain structures and novel bonding systems that enhance grinding wheel quality and optimise performance.

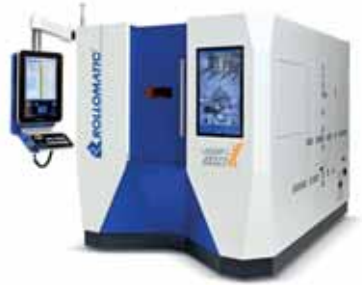
Diamond and CBN wheels that have been manufactured by Krebs & Riedel for more than 20 years are available from 3 mm to over 900 mm in diameter with peripheral grinding speeds of up to 160 m/s. The Krebs & Riedel specialists will be on hand to understand engineers grinding problems and to offer optimised solutions to improve grinding processes.

Comat is a specialist manufacturer of

high-quality filtration systems for the management of metal working cutting oil across the engineering industry. Through an in-depth analysis of each individual client's needs, Comat designs and manufacture super-filtration systems that deliver ≤2-3 µm filtration quality throughout the entire working cycle thus maximising the quality of parts produced on machine tools whilst minimising lifetime running costs and maintaining maximum coolant consistency. Comat filtration systems can be customised to meet specific client's needs allowing for maximum efficiency of the filtration process.

Rollomatic will be using the exhibition to

showcase its range of grinding machines which includes 5- and 6-axis CNC tool grinding machines, multi axis cylindrical blank prep grinding machines, special machines for the production of punches and form tools for the medical and stamping industries and very special laser machines for the production of CBN and similar exotic tooling. Rollomatic also offers robot



platforms for various tasks. Rollomatic, one of the best known, most successful and highly respected manufacturers of multi-axis CNC grinding machines, is the machine of choice for the production of rotary cutting tools of all kinds and for non-round tools such as punches. Indeed, more rotary cutting tools are manufactured in the UK and Ireland on Rollomatic machines than on all others put together. GrindSmart® machines excel at producing cutting tools of up to 20 mm in diameter and the superior Swiss manufactured quality of every Rollomatic machine is demonstrated with its industry leading 3-year unlimited hours parts and labour warranty that comes as standard on all new Rollomatic machines.

Tschudin machines benefit from several patented features that give them major advantages over any other machines in their class and today the Tschudin Cube machine is stated as being the world's easiest, simplest and fastest CNC centreless grinder to set up. With the Tschudin's machine base and spindle blocks made from natural granite and the optionally and newly available grinding spindle housing made from Invar, Tschudin is mastering the worst enemy of grinding which is thermal expansion due to heat variances. Ultra-precise linear slides, linear axis motors and programmable cooling supply systems are state of the art technology for the highest production demands. The Tschudin Proline Centreless Grinder eliminates almost all of the mechanical

manual procedures for setup and grinding, especially the adjustment of the workrest blade height.

Nova manufactures flexible CNC grinding systems 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.

On the MAW stand you will find Gerber deburring and polishing machines. The technique of brush honing ultra-hard materials has been pioneered by Gerber for more than 40 years. The Gerber BP-M machines use advanced part dedicated brushes which result in a repeatable material erosion during the honing/polishing process.

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Krebs & Riedel - Hall 7 - Stand: A35
Comat - Hall 7 - Stand: A60
Rollomatic - Hall 8 - Stand: B70
Tschudin - Hall 9 - Stand: C50
Nova - Hall 10 - Stand: B36
FLP - Hall 10 - Stand: D26
Gerber - Hall 10 - Stand B80

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14-17/05/2024
Please visit us: Hall H08 - Booth B70

Ground in one single setup with
our ultraefficient Lean grinding process

ROLLOMATIC®

New development in a class of its own

GrindingHub 2024 will be the stage for the latest development from Junker. Its Platform 3 development opens up far-reaching options for the future.

Junker's grinding technologies are constantly being further developed and presented with the challenges of the market. With ever more productive grinding concepts, it offers the perfect solution for continually increasing demands on efficiency and precision. Platform 3 was designed with this in mind right from the development stage.

The company will present the JUMAT 3S for high-speed grinding with CBN and the JUNICOR 3L for corundum applications. Providing new solutions for flexible manufacturing processes, the JUMAT cylindrical grinding machine leaves nothing in demand. During GrindingHub 2024, visitors can experience the grinding of high-speed shafts in person. Junker uses CBN wheels to grind diameters, shoulders and ends, while the peel-grinding technology comes into play for the diameters. Due to the different grinding spindles, grinding grooves and bearing seats that are twist-free, using a traditional plunge-cut process is also possible.

The JUNICOR 3L provides precision grinding with corundum The JUNICOR corundum grinding machine is an outstanding addition to the JUNKER Group portfolio and it impresses with its precision and variable configuration options.

JUNICOR covers all conventional corundum grinding requirements. It is ideal for grinding workpieces of all sizes, offers maximum flexibility and achieves outstanding grinding results. The JUNICOR will be presented for the first time at GrindingHub 2024 with its grinding diameters and shoulders on Turbocharger shafts using angular plunge-cut grinding.

Filtration systems as the perfect complement

Filtration systems guarantee efficient and sustainably cleaned air by extracting cooling lubricant mist in the metal producing industry. Dust filters, pipework, fire protection systems and central extraction systems complete the all-around service provided by the specialist for clean air.

Joachim Himmelsbach, CTO of the JUNKER Group, says: "The main goals of the new development are to increase flexibility and cost-effectiveness by optimising the modular system. The advantages of the modular system include a uniform basis for all Platform 3 machine models, which reduces throughput times and allows customers to benefit from shorter delivery times."

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Hall 10 - Stand: B50

ARGUS

A wholistic approach to gear grinding

GrindingHUB 2024
Hall 10/D50

REISHAUER
Gear Grinding Technology

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BLOHM PLANOMAT XT with tool changer to be launched at GrindingHub

With the tool changer for the PLANOMAT XT, BLOHM presents a cost-efficient solution for the automatic change of grinding wheels that is unique in this market segment.

The highly productive PLANOMAT XT combines three grinding technologies in one machine: pendulum, creep feed and highspeed stroke grinding. Thanks to the tool changer these procedures can now be automated.

In this process, the changer offers users many benefits. It can be loaded with several tools of the same type to be able to replace worn grinding wheels quickly and automatically. The tool changer also makes unsupervised processing possible, even of complex workpieces requiring grinding wheels with different profiles. Additionally, setup times are reduced as the unit can be loaded while the process is ongoing. The tool changer also improves general machine handling because it is easier for the machine operators to load the changer with large grinding wheels instead of fitting these in the machine themselves.

Users also benefit from significantly more efficient machining. For instance, roughing, finishing and polishing grinding wheels can be prepared in the changer to achieve a high abrasion performance and an accurate level of detailed surface machining as part of a single process.

BLOHM presents the tool changer for the PLANOMAT XT at the booth of the UNITED GRINDING Group. The application shown simulates grinding of a tool with polished surface for the coating of battery electrodes. Another BLOHM machine at the booth will be the PLANOMAT XT 408 with a special application that shows the grinding of a workpiece in the tool and mould sector.

BLOHM grinding machines have been used worldwide for decades, wherever productivity, performance and precision are required. They are developed in Hamburg and produced in a modern manufacturing facility to high quality standards. More than 15,000 delivered machines reflect the international recognition of the BLOHM brand.

After selling more than 19,000 JUNG machines worldwide, Blohm Jung GmbH is committed to preserving and developing its leading position in relation to precision, quality and surface quality.

Special highlights of the machines include:

- Modular design of the machines offers sophisticated solutions for almost any workpiece size.
- Varied machine applications can be integrated according to customer requirements.
- Automated grinding machines, including tool change, measuring and clamping systems.
- Worldwide presence in the market segments of general mechanical engineering, bearing, automotive, hydraulic, tool making and turbine industry.
- Technology and demonstration centres in Hamburg and Göppingen, Germany, make extensive know-how available to customers.
- Technological leadership in the aviation turbine industry.
- Worldwide sales and service network for consultation and customer service directly on the spot.
- HelpLine, remote service and field service for maintenance with system.
- Traditionally proven approach based on a strict quality code, combined with the use of cutting-edge methods (ISO 9001).

Together with MÄGERLE , the BLOHM and JUNG brands form the surface and profile grinding technology group within the United Grinding Group.

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 2,300 employees at more than 20 manufacturing, service and sales locations, the Group is organised in a customer-oriented and efficient way.

Through its 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.

The tradition of the group companies goes back more than one hundred years, during which more than 150,000 machines were manufactured and delivered throughout the world. This longstanding experience and broad technological expertise make the United Grinding Group a reliable and competent solution provider for complex manufacturing tasks.

The innovative technologies of the companies in the United Grinding Group have a broad range of applications, from single part production through to mass production, from small businesses to large corporations and are used in a wide variety of industries. Key areas are the automotive and supplier industry, medical, aerospace industry, tooling, die and mould, transportation and heavy industry, machine manufacturers, energy and precision engineering.

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Hall 9 - Stand: C51.3

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

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Tel.+39 0332 543 411 - Fax +39 0332 537 468
e-mail: info@ghiringhelli.it - http://www.ghiringhelli.it

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GRINDING HUB
Stuttgart, 14.-17.05.2024
Hall 10 Booth 20.2

The new M100: Appreciated in the most cutting edge sectors

by Claudio Tacchella

The new Ghiringhelli M100 centreless grinding machine stands out in combining high technology in a very compact machine dimension and is particularly suitable for the grinding of pieces in medium-high batches belonging to different industrial sectors.

In the range of products manufactured by the Italian company Rettificatrici Ghiringhelli S.p.A. in Luino (VA), the M100 CNC6A centreless grinding machine, recently innovated and exhibited at the GrindingHub exhibition in Stuttgart, Hall 10 - Stand 20.2, is technologically important. Among the most noticeable features, the new design stands out by combining aesthetics, functionality, accessibility, ergonomics and integrated systems, thus accomplishing an "easy to use" machine with a small footprint. The general systems design was engineered with great attention to the dimensions to be used, e.g. by arranging the electric cabinet parallel to one side of the machine. The accessibility on the four sides is always guaranteed and safe. The control unit is housed on a new panel that can be adjusted by the user in the work area. For an even more ergonomic operation, the new M100 is now equipped with a standard mobile panel which adopts all the features already tested on top-of-the-range APG grinding machines. Besides, some solutions in the machine equipment were revised to make tooling operations easier, and the internal LED lighting in the work area was enhanced to assist the user in monitoring the grinding process.

All the software functions, automation with robotic systems included, are combined to those of the machine through the exclusive HMI Ghiringhelli interface

The new M100 is a mix of technological solutions for throughfeed or plunge grinding of pieces with diameters between 0.50 and 20 mm and lengths up to 130 mm

"We are proud of the M100 project," says Patrizia Ghiringhelli, CEO of Rettificatrici Ghiringhelli, "which boasts hundreds of applications worldwide. The compact, ergonomic and highly reliable line is much appreciated in technologically advanced sectors as aerospace, bike/motorcycle, automotive, medical, electric motors, power tools/tools, general fine mechanics and was already conceived for Industry 4.0 requirements."

Engineering excellence for the utmost accuracy

The new M100 CNC6A contains a mix of technological solutions for very high precision throughfeed or plunge grinding of pieces with diameters between 0.50 and 20 mm and lengths up to 130 mm for medium-0 high batches. The entire machine architecture rests on a solid mineral casting frame designed in 3D CAD and is engineered with thermometric and sound FEM analyses. The use of this material guarantees considerable vibrational damping and high thermal inertia, remarkable resistance to pressure/bending and, above all, a perfect ecological balance, as it is completely recyclable. The dynamic machine is basically conceived with six CNC axes. The two main working slides, V and Z axes, are overlapped and equipped with optical scales with resolution up to 1/10 micron and slide on pre-loaded linear guides with extra-

accurate rollerways. The grinding wheel mount head has a hydrodynamic spindle and allows the assembly of wheels of Ø 450 mm x L 130 mm, motor power up to 11 kW, constant peripheral speed up to 50 m/s (63 m/s optional) and automatic wheel balancing. The control wheel mount head has a spindle with high-accuracy bearings strengthened by an external 3rd outboard bearing able to mount wheels of Ø 200 x L 130 mm with motor torque up to 3 Nm. The control wheel mount head, mounted to the upper slide, can be tilted by +/- 5°, thus allowing the optimal adjustments of the piece mechanical stop on the workrest blade in the configurations with plunge cycles, or it allows the optimisations of the pieces' stroke speed between the wheels in throughfeed cycles. The grinding wheel dressing is NC controlled with a special orthogonal diamond unit (X/Y axes), as well as for the control wheel (X1/Y1 axes).

Advanced technologies of the Sinumerik-ONE and access security

The CNC used is the Siemens Sinumerik-ONE digital native which allows the programming in a TIA Portal environment with remarkable advantages for the end user.

Both the PLC and the safety are designed in an engineering environment with up-to-date software languages and a data flow without interruption. The Sinumerik-ONE certainly guarantees the required security standards as well, thanks to the Safety Integrated plus version. The NC backs these drive-integrated safety functions up. Moreover, thanks to the PLC Simatic S7 1500F integration, a single failsafe application to implement the security logic is necessary. All the software functions, automation included with loading/unloading systems, diagnostics, wheel libraries and profiles, cycles programming and training, statistical calculations, remote control, telediagnosis and predictive maintenance, are in fact combined to those of the machine through the exclusive HMI Ghiringhelli interface.

The M100 grinding machine lends itself to integrating automation systems such as anthropomorphic robots

Regarding the machine safety, the integration of a special plan finalised by the Ghiringhelli engineers as "layering" accessibility levels, is very interesting. It's an identification system that safely and reliably recognises the users responsible for the machine handling according to their skills, thus managing access authorisations. The machine efficiency is set on a special electronic key supplied to the end user, e.g. for the automatic cycle phase, manual cycle phase, adjustment phase and with the different priority levels. Depending on the level, various accesses will be enabled or denied. In this way a ranking of priorities is established where each level corresponds to a series of possible tasks.

These can be accessible and therefore modifiable by one or more users or be automatically controlled by the machine cycle without any manual access. To supplement this, the new M100 has a wide choice of accessories and optional devices for the highest customisation of the system and several available solutions for diagnostics, remote service assistance, also through the most recent Artificial Intelligence (AI) technologies.

There are solutions available for the remote assistance through Artificial Intelligence (AI) technologies

The M100 is much appreciated in cutting edge sectors as those for powertools/tools

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Hall 10 - Stand: B20.2

Curtis Machine Tools is revolutionising production grinding

Curtis Machine Tools (CMT) is set to display the Vector Quad at GrindingHub Stuttgart, presenting a groundbreaking advancement in peel grinding technology for small intricate carbide tools. Leveraging CMT's latest patented technology, this machine excels in simultaneously grinding two tools, doubling the output compared to traditional tool and cutter grinders. The inclusion of post process closed-loop camera measurement guarantees consistent quality, ensuring that optimal form and size are maintained throughout the entire production run.

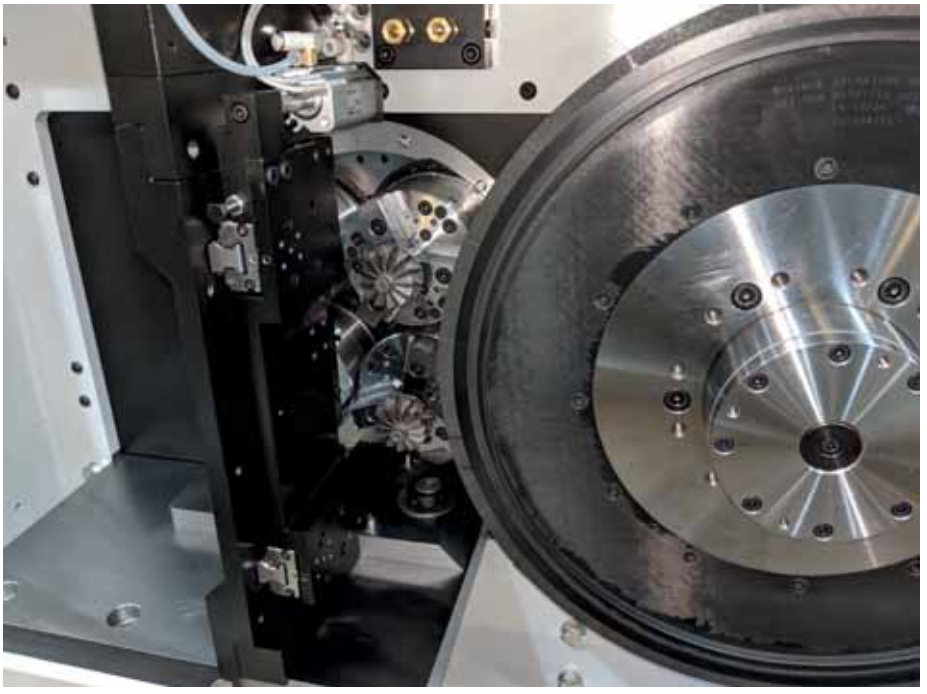
GRINDING HUB
Stuttgart 14-17.05.2024
Halle 9 | A40

Curtis Machine Tools (CMT), a distinguished British manufacturer specialising in high-precision grinding machines for intricate components, has a rich history of over 50 years. Its expertise extends globally, providing tailor-made grinding solutions to manufacturers across various industries such as automotive, bearing, cutting tool, defence and hydraulic sectors.

Renowned for its patented Grind in a Box technology, CMT has achieved international success. Building upon this innovation, it has developed the VECTOR family of grinding machines. The dedicated engineering team at CMT continuously pioneers new grinding methods and applications, precisely customised to meet customer needs and adapt to market conditions, thereby optimising production efficiency.

Furthermore, CMT offers comprehensive turn-key systems by integrating ancillary processes such as deburring, washing, inspection, marking, packing and more alongside the grinding process. With a commitment to providing limitless possibilities for engineering and implementing user-specific requirements, CMT boasts a substantial presence with hundreds of machines deployed in the field, ranging from standalone solutions to fully automated production lines. As a market leader, CMT is the preferred partner for process-oriented solutions.

The VECTOR serves as the foundational platform for machines featuring an extended radial stroke and a compact axial stroke. It caters to single, multi-plunge, or peel grinding operations on components positioned between centres or secured in a



chuck. Offering optional C-axis control for thread or polygon grinding, an integrated loading system and an exceptionally small footprint, the VECTOR ensures an outstanding return on investment.

Twin
The VECTOR Twin integrates an indexing twin-spindle work head, facilitating loading and secondary operations. This dual-spindle design enables concurrent loading and unloading while grinding occurs on the other spindle, minimising spark-to-spark time and optimising cycle time for production.

Quad
The VECTOR Quad, an evolution of the proven VECTOR Twin, transforms production grinding. Featuring an innovative four-spindle work head, it allows simultaneous outer diameter or contour grinding on two workpieces using the same grinding wheel, effectively doubling the output.

Thread/Worm
Evolving from the established VECTOR Twin, the VECTOR Thread/Worm revolutionises the production grinding of threads and worms. Featuring an adjustable wheel and dressing spindle with an inclination ranging from -20 to +20 degrees, coupled with a grinding spindle speed of 140 m/s and simultaneous loading/unloading during the grinding process, this advancement signifies a new level of optimisation in thread/worm grinding.

Pendulum
The Vector Pendulum is purposefully designed with two workpiece spindles on either side of the main grinding spindle, enabling the combination of two grinding processes in one machine. Loading and unloading occur while the part in the opposite workhead is being ground.

GFS
The VECTOR Grind from Solid (GFS) builds upon the VECTOR's foundation, incorporating a bar feed system for precision grinding of small intricate parts from standard or hardened bars. The workpiece is subsequently cut off using a separate spindle, eliminating the need for turning or hardening operations.

Rotary
The VECTOR Rotary, based on the established VECTOR model, positions the workhead on a programmable B-axis. This configuration enables the machine to perform straight or angle approach grinding, with the added capability to produce complex spherical blended profiles in a single clamping.

Centreless/Concentric
The VECTOR Centreless/Concentric, a derivative of the proven VECTOR, integrates a control wheel and work rest blade setup. This configuration allows for plunge or angle approach centreless/concentric grinding of complex and slender parts.

Nano
Specifically designed for ultra-precision grinding, the VECTOR Nano features a hydrostatic wheel spindle with a speed of 120 m/sec. Its workhead guarantees minimal axial and radial position variation, less than 0.0001 mm, incorporating glass scale absolute linear encoders for both X and Z axes with a 1 Nm measurement increment. The machine boasts high mechanical rigidity, extremely fast spindle speeds, excellent damping, high overall loop stiffness and thermal stability.

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Grinding and digital solutions from Kapp Niles

KAPP NILES manufactures diamond profile rolls as well as diamond form rolls for generating grinding with ceramic-bonded worms. In large-scale production, the dressing of the worms can also be carried out with highly productive multi-ribbed diamond profile rolls. For profile grinding, diamond form rolls in sintered design are offered for profiling dressable profile grinding wheels. Diamond dressing gears for profiling dressable honing rings complete the portfolio.

Diamond form rolls are available in sintered design for profiling dressable profile grinding wheels. In addition to the economic version with natural diamond, these are also offered as a long-life tool with handset CVD diamond. It is possible to reground these tools several times and they are characterised by a long life time.

The portfolio includes workpiece-specific dressing rolls for dressing of ceramic-bonded worms as well as dressing rolls for flexible or topological dressing. Dressing tools are used for generating grinding with natural entanglement and topological generating grinding with influenceable bias.

Multi-ribbed diamond profile rolls are also available for fast and efficient dressing. They are produced in galvanically negative design for a wide range of modules and rib numbers.

For serial production, an integrated tip dresser is used for defined grinding of the gear root area. Dressing rolls without tip dresser are also part of our portfolio.

The dressing tools for fine and polishing grinding, used in electromobility, are high-precision designed. The special feature of such a dressing roll is, in addition to the reference surface optimisation, the reworking of the diamond grains after the coating of the dressing roll base body.

Diamond dressing gears are offered for profiling dressable honing rings. This type of tool is also available as a tool set consisting of dressing gear and integrated tip dressing roll to move back the tip of the tooth at the honing ring.

KAPP NILES manufactures non-dressable, electroplated single-layer CBN tools for hard and soft finishing of gears and profiles. Its tools have been among the top products worldwide for decades. They are used when the highest demands are made on quality, performance and economy.

CBN profile grinding wheels are available in single or multi-ribbed roughing and finishing design and are used for grinding of:

- External and internal gears in the automotive and aircraft industry.
- Radial, screw, rotor and worm profile wheels.
- High speed grinding of profiles and gears.
- Plunge grinding, abrasive cutting and cylindrical grinding.

CBN grinding worms are available in roughing and finishing design. They are used as cylindrical grinding worms for highly productive grinding of external gears and other profiles. Grinding worms and profile grinding wheels are often used in combination.

You can meet the requirements for the highest surface qualities economically and reproducibly with fine or polishing grinding on KAPP NILES machines. Combined tools with different specifications are used for this purpose.

Conventional generating grinding uses a ceramic-bonded corundum grinding worm that consists of one specification throughout.

Fine grinding uses a combined tool with two specifications. In addition to the conventional grinding area, the tool has a fine grinding area that differs in terms of the tool specification. This allows surface finishes of Rz = 1 - 2.5 micrometre to be achieved with process reliability.

For even higher requirements, conventional grinding is combined with polish grinding. For this process, a tool with two areas is used. For polish grinding, a tool area with an elastic polyurethane or synthetic resin bond is used. Surface qualities of Rz < 1 micrometre can be achieved.

After hardening, gears are conventionally ground to remove the existing allowance including hardening distortions and to produce the final workpiece geometry. The tooth flanks are then shot-peened to harden the surface. In the final work step, they are

polish-ground with a one-piece polyurethane-bonded tool as a single technology to achieve a high surface quality.

With the demands for higher flank load capacity of gears and efficiency increases of gear boxes, fine and polish grinding has become more and more established in recent years, especially for applications in the passenger car and commercial vehicle sector. By integrating these downstream processes, surface finishes of Rz < 1 micrometre or Ra < 0.2 micrometre can be achieved on conventional gear grinding machines.

Digital solutions

Process Monitoring can be defined as component-specific monitoring and evaluation of the grinding and dressing process. It is possible to generate an action instruction from the sensor signals. Various characteristic values are formed from time signals, in the simplest case these can be maximum or Root-Mean-Square (RMS) values of the signals. The characteristic values are then combined with the known project data via algorithms and processed into indices, such as a noise or damage of grinding worm index. Process Monitoring has interfaces to further functionalities, such as part tracing and an export function for off-machine analysis.

Transmissions in e-mobility do not only have to be efficient, but also quiet. Up to now, workpieces with negative noise behaviour have usually been detected in EOL or in some cases on the roller test bench. The common random measurement of machined workpieces can only detect individual deviations, which later have an effect on the noise behaviour of the gearbox. This is where the process monitoring developed by KAPP NILES comes into the picture.

Based on internal machine control signals and signals from specifically used acceleration sensors, characteristic values are formed to assess the grinding process.

This makes it possible to identify workpieces with noticeable noise during machining effectively and cost-effectively. This reduces the amount of scrapped parts.

In addition to noise anomalies, other deviations can also be detected with the support of process monitoring in order to meet the high quality requirements in the field ofe-mobility.

The data obtained with process monitoring can be used, among other things, to establish a correlation between the processing machine and the transmission test bench or measuring machine. This makes it possible to derive further findings for process optimisation.

Condition monitoring from KAPP NILES makes it possible to monitor the condition of linear and rotary axes with regard to wear. The wear is determined by reference runs after workpiece machining and can be started manually or via a timer function. No retooling is necessary for this as the reference run is carried out independently of the tooling being set up. The condition is evaluated by means of indices, after which a prognosis is made about the durability of the axes.

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Hall 7 - Stand: A40

The premier class for the highest demands

The KELLENBERGER 1000 series was developed for the high demands of precision production of prototypes, as well as small and medium series, e.g. in tool and mould making, the automotive and electrical industries and the aircraft industry. The solid machine table with the reinforced machine bed provides very high static and dynamic rigidity and stability, a prerequisite for high precision. With centre heights of 200/250/300 mm, centre widths of 600/1,000 mm, generous X-axis strokes of 365 mm and Z-axis strokes of 1,150/1,670 mm, the KELLENBERGER 1000 covers a wide range of workpieces weighing up to 300 kg.

The automatic 1° indexing axis with high positioning accuracy and the direct-drive internal grinding spindles up to 60,000 rpm are further features. The KELLENBERGER 1000 is equipped with hydrostatic guides in all main axes for maximum shape accuracy in grinding tasks with interpolating axes. The B-axis has a direct drive. The turret grinding head swivels around three times faster and positions with an accuracy of less than one angular second. This reduces non-productive times and thus increases productivity, especially when processing requires the swivelling in of different grinding wheels.

Over 30 grinding head variants with external and internal grinding spindles are standard on the KELLENBERGER 1000. Operator guidance is via an intuitive 19" touchscreen interface on the latest Fanuc 31i CNC control system. The innovative BLUE Solution software enables even inexperienced operators to program quickly and intuitively.

Integrated Z2 axis for automatic length compensation

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.

The Z2 axis moves on the Z axis and the automatic zero-point shift is performed via a longitudinal probe. Workpieces up to a diameter of 300 mm can be machined while a steady rest can be clamped for longer workpieces. Non-circular parts can also be ground. These are oriented fully automatically on the C-axis.

Flexible for maximum customer orientation

The KELLENBERGER 100 offers a wide range of configuration options for a wide variety of grinding operations and thus enables a strong customer focus. With a centre height of 200 mm, centre width of 600/1,000 mm and generous X-axis strokes of 365 mm and Z-axis strokes of 750/1,150 mm, the machine covers a wide range of workpieces weighing up to 150 kg. The automatic 1° indexing axis with high positioning accuracy and the direct-drive internal grinding spindles up to 90,000 rpm are further features. The large drive power of the grinding wheel results in high productivity, while the new Z-guide ensures high profile accuracy. The C-axis with direct drive provides greater accuracy for non-circular grinding.

The technical highlights of the KELLENBERGER 100 include an innovative compact grinding head, 10 grinding head variants, 11.5 kW drive power, 500 mm wheel, up to 63 m/s, HF spindles for internal grinding incl. diagonal and tandem arrangement, a collision-free universal head with three tool and one measuring position as well as a new measuring probe arrangement without swivel mechanism for increased measuring accuracy. A synchronous tailstock allows the complete machining of shafts without a driver, i.e. the workpiece can be machined completely over its entire length.

The reinforced casing allows larger grinding wheel diameters for internal grinding. Operator guidance is via an intuitive 19" touchscreen interface on the latest FANUC 31i CNC control system. The

innovative BLUE Solution software enables even inexperienced operators to program quickly and intuitively.

Flexible for small and medium batches

The VOUMARD 30 internal grinding machine is ideal for all industries whose main focus is on simple internal grinding operations in the small and medium series. With a footprint of 1.80 x 1.80 m, the very compact machine is designed for workpiece lengths of up to 150 mm and diameters of up to 150 mm. Depending on the application, either one or two high-frequency internal grinding spindles arranged in parallel can be used. These high-quality internal grinding spindles ensure the best grinding results with short cycle times. They are available with speeds of max. 45,000, up to 120,000 min-1. Other outstanding features are the high-precision work headstock and a high-precision X/Z cross table. These ensure the best grinding results with short cycle times. They are available with maximum speeds of 45,000 to 120,000 rpm.

Other outstanding features include the high-precision work-head and a high-precision X/Z cross table. The VOUMARD 30 can be equipped with three different dressing devices. 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. and the robot can be optionally integrated into the machine enclosure.

The KELLENBERGER 1000 with Automation FLEX, KELLENBERGER 100 with Automation FLY and VOUMARD 30 machines will all be on display at GrindingHub.

UK Agent:
DF Precision Machinery Ltd
Tel: 0116 2013000
Email: sales@dfpmach.com
www.dfpmach.com

KELLENBERGER | Hardinge Kellenberger AG
Hall 8 - Stand: B60

42 years of solving surface finishing problems

Fintek will showcase developments in post-processing and surface finishing, including larger components, superfinishing and mass finishing, at MACH. Fintek is the UK agent for OTEC Präzisionsfinish disc, drag and stream finishing machines. This year, OTEC has expanded its electro-finishing range.

Besides machine sales, Fintek provides a full subcontract service to precision engineers. Processing components for manufacturers in aerospace, motorsport, medical device and more.

Manufacturers need speed, capacity and precision to meet in-line production needs. With repeatable surface roughness values down to Ra 0.01µm possible, OTEC stream finishing machines meet these objectives. Automation options include increased chain-feed loading and unloading along with full robotised operation.

OTEC SF machines can be equipped with 'Pulsfinish'. This pioneering technology produces rapid relative motion between the media and metal workpiece. It achieves this by quickly alternating the direction of the rotating heads. Fast acceleration and deceleration amplify the finishing forces exerted on the workpiece. This produces a perfect finish, faster and without compromising workpiece geometry.

All OTEC machines are Industry 4.0 ready. An advanced package is also available on CF, DF and SF machines. This includes an industrial PC to give more advanced digitalisation. Superior machine monitoring and process optimisation via remote maintenance are clear benefits.

Alongside OTEC machines, the company brings to the UK the RENA Technologies Hirtisation process. This allows Fintek to offer AM part post-processing as a subcontract service. Hirtisation removes support structures, powder cakes and partially melted grains. It penetrates extreme geometry complexity and small diameter holes.

MACH 2024 sees Fintek reach its 42nd year. Forty-two is the answer to the ultimate question of life, the universe and everything. At least, according to Douglas Adam's creation, Deep Thought, a giant computer in his acclaimed book, Hitchhiker's Guide to the Galaxy. Fintek may not be able to verify that answer. Yet, 42 years serving the post processing and surface finishing needs of UK component manufacturers is no small feat. It brings this wealth of cross-industry expertise to its customers.

Founded by Jonathan Dean in July 1981, originally as Finishing Techniques, the company quickly established itself in the UK as experts in metal surface finishing. From aerospace to F1 components, through medical devices, to mass finishing small and thin parts, the company has attained a wealth of cross-industry experience.

"Starting a business at the peak of a major recession and contraction in the manufacturing base, seems almost reckless when I look back now. However, change was coming, industry was also renewing itself and advanced surface finishing technology was in demand," Jonathan Dean explains.

In the mid 90s, a step change came when OTEC Präzisionsfinish GmbH, then a little-known German start-up, launched its first surface finishing machines. Fintek now supply, exclusively in the UK, the full range of OTEC disc, drag, electro and stream finishing machines and offer extensive subcontracting services. OTEC has gone on to grow into a global company with significant research and development resources.

Fintek has grown significantly along with OTEC. All the CF and DF machines have been received well in the UK. However, the biggest game-changer came with the SF range. Stream finishing has opened-up many high-end applications, where increased controllability and precision are essential. Besides driving machine sales, the advanced capabilities of the SF range has propelled the rapid expansion of Fintek's subcontract services.

"As a machine seller, our wealth of knowledge gained from real-world subcontract projects means we understand the challenges faced every day by engineers. We currently run 16 OTEC machines, eight of which are newer stream finishing systems, some with their patented 'Pulsfinish' and step-processing technologies. This gives us tremendous insight into surface finishing problems encountered across different industries," adds, Jamie Phillips, Fintek's general manager.

Additive manufacturing is a maturing technology and surfacing finishing is advancing to meet the post processing needs of 3D printed metal parts. Removal of support structures, powder cakes, partially melted grains, and penetrating extreme geometry complexity and small diameter holes, requires a new approach. Forming a new partnership in January 2021 to bring to the UK the RENA Technologies' innovative Hirtisation process, allows Fintek to offer manufacturers AM part post processing as a subcontract service.

Finishing Techniques Ltd
Tel: 01706 283 927
Email: info@fintek.co.uk
www.fintek.co.uk

Stand: 19-16

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MecWash Systems celebrates 30 years of excellence at MACH

MecWash Systems, a leader in the design and manufacture of industrial parts cleaning systems, is thrilled to be participating at MACH. This year is particularly special for MecWash as it marks the company's 30th anniversary, a significant milestone that underscores three decades of innovation, quality and commitment to excellence in the parts cleaning industry.

MecWash will be showcasing the MWX range on its stand. Visitors to the stand will have the opportunity to meet with the MecWash team, explore comprehensive cleaning solutions and learn more about the latest advances in component cleaning technology. MACH24 provides the perfect platform for MecWash to engage with long-standing customers and forge new business relationships.

John Pattison, managing director of MecWash, is full of anticipation for the event: "MACH represents the pinnacle of UK manufacturing and we always enjoy a positive experience at the NEC. Celebrating our 30th anniversary at this event offers us a unique opportunity to engage with key figures in the manufacturing world. Establishing, building and maintaining relationships has enabled MecWash to develop a strong reputation throughout the manufacturing sectors.

"Discovering how our systems have provided solutions to blue-chip organisations around the world, solidifies the decision for many to choose MecWash. Our parts washers are trusted by industry giants like Rolls-Royce, JCB, Renishaw, Husco and Brompton Bicycles, due to our success in meeting the stringent industry cleaning requirements.

"We will have the MecWash MWX300 and MWX400 systems on show, which embody the zenith of component cleaning. These machines provide consistent high quality results in industrial environments and are particularly favoured in the automotive, aerospace and hydraulic sectors."

Paul Jarratt, sales manager, comments: "This is the biggest event for MecWash and is extra special with out 30th anniversary. Personally, I'm really excited to reconnect with our industry partners and discuss the effective solutions that we are providing for our customers. We always take the long-term perspective when recommending solutions to customers, ensuring the most suitable system for our customers' unique requirements.

"As sales managers, Alan Atkinson and I work closely with our customers to understand their specific application to provide the most firring cleaning solution." Paul Jarratt also emphasises MecWash's commitment to maintaining its systems throughout their lifecycle, ensuring longevity and performance.

MACH will be attended by the biggest names in international engineering and manufacturing, showcasing all the latest innovations.

"With a strong start to the year and MACH on the horizon, the MecWash team is fully energised for an exceptional showcase at the NEC," concludes John Pattison.

For further information about bespoke parts washing machines made by MecWash Systems, call 01684 271600 to discuss your cleaning requirements.

Established in 1993, MecWash Systems Ltd specialises in the design and manufacture of a complete range of aqueous parts cleaning and degreasing systems for metal and plastic engineering components. Its capabilities include laboratory analysis of complex component cleaning issues and specifying or developing specialist detergents, plus the ability to design special processes and parts washers for particularly difficult cleaning challenges.

MecWash parts washers are used in the aerospace, automotive, defence, general engineering and medical industries. It specialises in achieving high cleanliness standards for components with intricate geometries, difficult substrates or tenacious contaminants. Its parts washers support the full range of engineering processes, including machined castings, forgings, turned parts, pressings, extrusions and mouldings.

MecWash Systems Ltd
Tel: 01684 271600
Email: enquire@mecwash.co.uk
www.mecwash.com

Stand: 18-115

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at stand 430 in Hall 6

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sales@master-abrasives.co.uk
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One company - a full Grinding Solution

Master Abrasives becomes an authorised ROSA machine representative

Midlands-based Master Abrasives has recently been appointed as the ROSA Ermando S.p.A authorised agent in the UK and Ireland, a leading worldwide supplier of grinding machines based in Italy.

For this brand addition to Master's range, discussions have been handled slightly differently and it has been mutually agreed with ROSA's current distributor that Master Abrasives will work closely with them in a gradual handover.

For several years, ROSA has been represented in the UK by NL Machine Tool Consulting Limited whose managing director, Norman Loughton, has served them very well and has a long history in the UK machine tool industry. As he is now considering slowing down as he heads towards retirement, it was fortuitous that Master Abrasives and ROSA had started discussing future representation in the UK.

Following a three-way discussion, it was mutually agreed that Master would represent ROSA from the 1st Jan 2024, working closely with Norman Loughton in a slow and seamless hand over.

Paul Batson, Master Abrasives' managing director, states: "Whilst we are very honoured to have reached an agreement to represent ROSA and work with them on potential new business, we also want to show our respect for the work that Norman has put in to the brand and customer base over recent years. For this reason, it was critical that Norman was on board and we're glad he was happy to work with us on the smooth transmission from NL Machines Tools' distributorship to Master Abrasives."

ROSA, founded in 1964 by Eng. Ermando Rosa, designs and builds horizontal-spindle grinding machines for plane surfaces and profiles, grinding machines with universal head for slideways and profiles and creep-feed grinding machines. Mr ROSA bought the rival FAVRETTO Machines Tool company in recent years so they can also offer the range of FAVRETTO machines, sitting well beside the ROSA range for a very comprehensive machine portfolio.

Giuseppe Bucci, export manager at ROSA says: "This new partnership with Master Abrasives is a wonderful opportunity to keep serving the manufacturing community in the U.K. Our surface and profile grinders are optimally targeted towards many high-end grinding applications offered by British market.

Ian Meredith, Giuseppe Bucci and Paul Batson met to discuss the new partnership in January

Master Abrasives with its expertise and competence will add value to the quality and reliability supplied with any ROSA surface grinder by providing process-related support and guidance. I am sure this collaboration will set the basis for increasing our market presence by assisting existing customers and becoming a reference for new prospects."

The ROSA Linea Iron grinding machine will be on display at MACH 2024

Ian Meredith, Master Abrasives applications engineering manager, comments: "ROSA have a great history and pedigree in the machine tool industry and its range falls very nicely into our machine tool portfolio. We can offer our customer base top quality machine tools but with the support of abrasive products to ensure they get the optimum productivity out of their machining set up."

The main industrial sectors where ROSA surface grinders are to be found are mould and dies manufacturers, tool makers, the machine tool industry, aerospace industry guideways and linear guiding systems and circular knives and straight knives for steel, aluminium and paper industry, all of which will be a target markets for the Master team and potentially others that are waiting to be developed. You can visit Master Abrasives at MACH exhibition this year to see a ROSA machine on its stand.

Contact Master Abrasives' team for more information on ROSA machinery and repairs to assess your application requirements with professionals by emailing: **sales@master-abrasives.co.uk**

Master Abrasives
Tel: 01327 703813
www.master-abrasives.co.uk

Stand: 6-430

The all new Lapmaster SL15 range

In the dynamic landscape of precision manufacturing, efficiency, versatility and space-saving solutions are paramount. Enter the new Lapmaster SL15 series of bench-top lapping and polishing machines, poised to revolutionise the industry with their innovative features and economical design. Let's delve into what makes the Lapmaster SL15 range a game-changer for manufacturers worldwide.

The Lapmaster SL15 series is built upon a lightweight aluminum frame and features a highly efficient helical-bevel geared motor. This winning combination not only saves on energy consumption but also optimises bench space, making it an economical choice for manufacturers looking to maximise efficiency without compromising on performance.

Versatility is key in modern manufacturing and the Lapmaster SL15 series delivers with a panel-mounted peristaltic pump that provides universal processing for both loose conventional abrasives and diamond-based compounds. Additionally, a magnetic stirrer mounted to the side of the machine offers simple and maintenance-free agitation, ensuring consistent results across a variety of compounds and applications.

The Lapmaster SL15 series goes above and beyond to accommodate different customer needs with a wide range of features and improvements. These include an optional fully enclosed interlocked hinged guard system for added safety, improved operating ergonomics for enhanced user experience and an internal waste tank that reduces machine footprint, optimising workspace efficiency.

Precision control is essential in lapping and polishing operations and the Lapmaster SL15 series offers enhanced control with features like lap plate variable speed control as standard. Furthermore, the machines are available with a choice of power supply cables and plugs to suit the country of destination, ensuring seamless integration into any manufacturing environment.

With the introduction of the new 15" 4-Ring option, the Lapmaster SL15 series now offers a 33 percent increased capacity for parts up to 108 mm in diameter. This expanded capacity opens up new possibilities for manufacturers, allowing them to process more parts with ease and efficiency.

The Lapmaster SL15 range of bench-top lapping and polishing machines represents a leap forward in efficiency, versatility and performance. With its economical design, universal processing capability, enhanced features and expanded capacity options, these machines are set to redefine the standards of precision manufacturing.

Lapmaster Wolters Ltd
Tel: 01752 891600
Email: sales@lapmaster-wolters.co.uk
www.lapmaster-wolters-uk.com

Stand: 18-552

Rösler UK to showcase broad range of finishing solutions at MACH

Rösler UK will be exhibiting at the upcoming MACH exhibition in Birmingham. Committed to driving innovation and creating value for UK manufacturers, Rösler is excited to show attendees an array of finishing solutions for traditionally produced and additively manufactured parts and components which represent best-in-class solutions for a range of industrial applications.

Experts in shot blasting and mass finishing technologies as well as bespoke post-processing solutions for Additive Manufacturing (AM), the company will be demonstrating its RMBC 2.1 Tumble Belt Blast Machine, its R220EC Rotary Vibrator with R250 Dryer and two AM post-processing solutions.

Colin Spellacy, head of sales at Rösler UK says: "Rösler has been a prominent player in the mass finishing and shot blasting arena for over 80 years, providing solutions across a range of industry sectors including technologies for exacting medical and aerospace applications. Its impressive track record isn't just about its longevity, however, it's a story of accumulating profound knowledge and expertise that only come with time served. What sets Rösler apart is its family ownership, which means the company is all about playing the long game, focusing on what really matters, building solid, lasting relationships with clients by truly understanding and evolving with their needs rather than focusing on short term financial gains. This customer-first, quality-obsessed approach has made Rösler a go-to ally for anyone looking for unmatched finishing precision, reliability and quality. For often complex and demanding applications, Rösler stands as a beacon of trust, proving time and again that when it comes to mass finishing, shot blasting and bespoke AM Solutions, we are here to lead the way and drive innovation."

Rösler's RMBC Tumble Belt Blast Machine which will be on display at MACH, is essentially for de-sanding, descaling, de-rusting, deburring and creating homogeneous surface finishes and is characterised by perfect cleaning of difficult-to-reach surface areas, high equipment uptime, high process stability and consistent shot blasting results. The R220EC Rotary Vibrator, also on display, has an inbuilt separation system, is designed for processing batch parts and is perfect for all metal finishing applications from deburring to polishing. Being shown alongside these traditional finishing machines, attendees will also find two AM post processing technologies, the M1 Basic and the S1 Wet. The M1 Basic promotes superior surface finish of metal or plastic AM parts in a cost-effective and repeatable fashion and demonstrates how mass finishing technologies excel in eliminating layer lines, burrs and other surface imperfections on AM parts, resulting in a flawless finish that enhances both aesthetics and functionality.

The S1 Wet is a versatile wet-blasting solution for cleaning and finishing surfaces on metal and plastic parts and demonstrates

perfectly the usefulness of shot blasting technologies for AM parts.

Colin Spellacy continues: "We are excited to show attendees at MACH 2024 just what it is that sets our mass finishing and shot blasting technologies apart across all industry sectors.

"For the UK market, as indeed globally, we offer an extensive sales and service support network offering local expertise and quick responses to customer needs, especially important for applications requiring timely project execution and rapid maintenance responses. Rösler is also truly vertically integrated, manufacturing all machines in-house without third-party components and this guarantees the highest quality standards essential in industries where precision is non-negotiable. Emphasising automated and turnkey solutions, Rösler caters to the modern demand for efficiency and precision, offering a comprehensive package from design to installation, ensuring minimal error and maximum throughput. As a one-stop-shop for machine and media supplies with a strong post-sale care focus, the company also simplifies procurement, providing ongoing value through maintenance and training and fosters long-term partnerships, underscoring its commitment to reliable and long-lasting solutions for its customers."

MACH 2024 visitors are invited to come and see Rösler's traditional and AM finishing solutions on its stand and to discuss with the team how the company's blend of advanced technical capabilities, extensive industry knowledge and commitment to innovation can enhance their manufacturing endeavours.

For over 80 years, the privately owned Rösler Oberflächentechnik GmbH has been actively engaged in the field of surface preparation and surface finishing. As a leader, it offers a comprehensive portfolio of equipment, consumables and services around the mass finishing and shot blasting technologies for a wide spectrum of different industries.

Rösler UK
Tel: 0151 482 0444
Email: rosler-uk@rosler.com
www.rosler.com

Stand: 6-540

The UK's grinding landscape gets a boost

delapena and e-tech partner for advanced solutions

The world of precision grinding in the UK is set for a significant leap forward with the announcement of a strategic partnership between delapena, a leader in manufacturing honing technologies and e-tech, a renowned manufacturer of high-performance grinding machines. This exciting collaboration, to be unveiled at MACH 2024, promises to equip UK manufacturers with progressive grinding solutions designed to elevate productivity and quality.

e-tech boasts a long-standing reputation for excellence since its founding in 1972. Its machines are renowned for their unwavering commitment to precision, delivering tight tolerances and repeatability even for the most demanding applications. e-tech constantly pushes the boundaries of innovation, integrating cutting-edge technology and features that keep users at the forefront of grinding advancements. Additionally, the user-friendly design with intuitive interfaces and ergonomic layouts minimises training time and maximises ease of use. Finally, e-tech prioritises reliability, building its machines with robust components and putting them through rigorous testing to guarantee dependable performance.

With over 95 years of experience, delapena brings in-depth industry expertise and comprehensive support to the partnership. Its team of engineers hold a wealth of grinding knowledge. The nationwide support network ensures peace of mind, guaranteeing that your new e-tech machines and delapena honing machines are always operating at peak performance throughout the UK. Moreover, delapena is dedicated to maximising your investment, offering comprehensive resources and assistance to ensure you get the most out of your e-tech machines.

This collaboration promises significant advantages for UK manufacturers. Visitors to the delapena stand at MACH can:

- Witness the power of the latest e-tech grinding machine firsthand. Experience its precision and explore its capabilities in action.
- Consult with delapena' s grinding experts. Discuss your specific grinding requirements and discover how e-tech machines can elevate your operations.
- Unlock the potential for enhanced productivity, improved quality and reduced costs. Learn how delapena' s support and expertise can help you achieve these goals.

If you are looking to propel your grinding operations to new heights and unlock unprecedented levels of precision, efficiency and quality, the delapena and e-tech partnership presents a compelling solution. Visit them at Stand 19-335 at MACH 2024 and explore how their combined expertise can revolutionise your grinding capabilities.

delapena group Ltd
Tel: 01242 516341
Email: sales@delapena.co.uk
www.delapenagrinding.co.uk

Stand: 19-335

FINAIDS: Unlocking the power of deburring and finishing machinery at MACH

Finishing Aids and Tools Ltd has returned to MACH as an exhibitor and will be featuring the Lissmac SBM-L G1S2, suitable for machining workpieces in stainless steel, steel, aluminium and non-ferrous metals on both sides using three workstations. Double-sided workpiece processing and edge rounding in one pass gives time savings of up to 60 percent with additional automation solutions easily connected to or integrated in existing production lines.

FINAIDS will also be exhibiting two products from the VG Machines range: the C150 and CT650. Both machines are endlessly customisable with additional abrasive belt heads, top-down/barrel brush deburring attachments and electro-magnetic tracks available as optional extras.

The Kohler 18P600 Part Levelling machine, designed to address the challenges presented by uneven workpiece surfaces, will also be on stand 6-770. Kohler machines utilise a revolutionary electromechanicalprocess in the handling of metal parts and demands very little maintenance.

FINAIDS offers an established and extensive abrasive range for all applications and are the sole UK and Eire representatives of EKAMANT of Sweden, a leading manufacturer of coated abrasives, renowned for durability and superior performance among customers around the World and are a cornerstone of FINAIDS' production plant in Lancashire. Comprehensive solutions in both machinery and abrasives all from one source.

Visitors can expect live demonstrations, expert insights and the opportunity to engage with the FINAIDS team.

Managing director Rhod Howcroft considers the MACH show to be a giant leap forward for the Company. "We took the opportunity to launch FINAIDS Machinery division towards the end of the COVID pandemic and we're now able to offer finishing and deburring solutions from 75 mm to 2,000 mm widths thanks to partnerships with incredible suppliers. Of course, our core business as a converter and supplier of abrasive materials will feature, but we are very excited to introduce everyone to the range of machinery on the stand and push the boundaries of what is possible with finishing and deburring technology. The best way to make the most of any of these machines is to match them with bespoke abrasive processes, something we've been doing for 70 years!"

As industries continue to evolve and demand higher standards, FINAIDS has the expertise and experience needed to stay ahead in an ever-changing manufacturing landscape. Visit our stand and witness first-hand the future of metal fabrication and finishing!

FINAIDS
Tel: 01480 216060 (South)
Email: sales@finaids.com
or 0161 705 1300 (North)
Email: burysales@finaids.com

Stand: 6-770

Advanced Grinding Solutions to showcase cutting-edge grinding machines

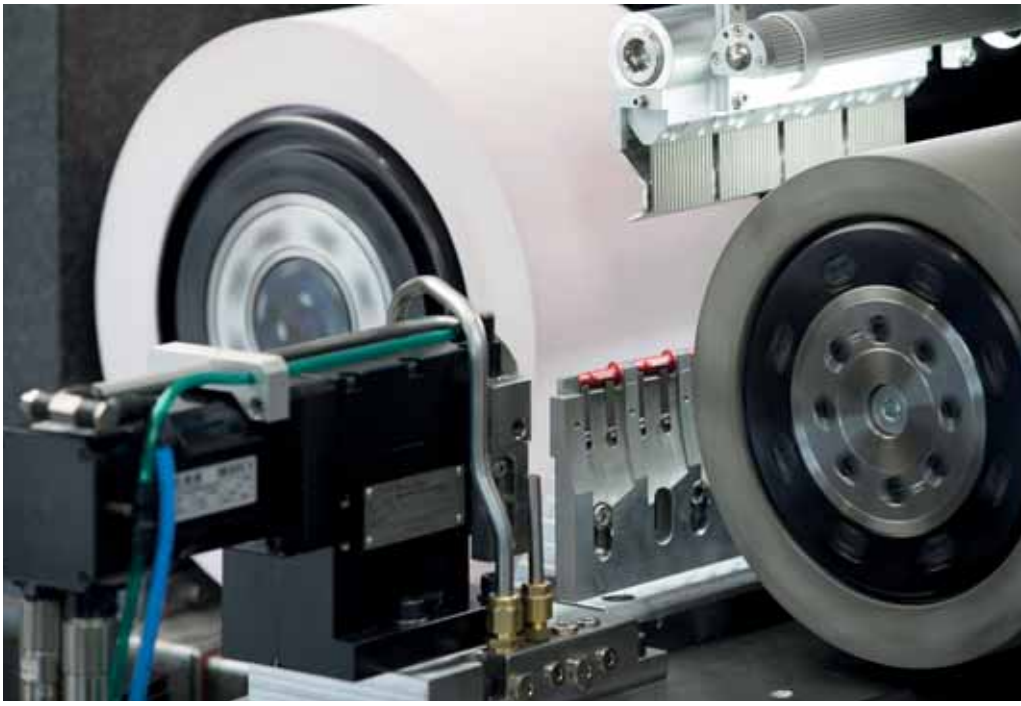
Advanced Grinding Solutions (AGS), a leading provider of high precision grinding machines and innovative grinding solutions, will be exhibiting at MACH. The company, joined by its principals from Rollomatic, Comat, Krebs & Riedel and Tschudin will exhibit its extensive range of cutting-edge grinding machines, super filtration systems and grinding wheels on it stand, showcasing its commitment to advancing the industry with state-of-the-art grinding and finishing technology.

Exhibits will include the very latest grinding solutions from Rollomatic, a leader in multi-axis grinding technology for the cutting tool and medical industry. Also present will be Comat who are exhibiting, for the first time in the UK, its latest C-240 Super Filtration system that after the Mach show will be used to support two Rollomatic grinding machines recently supplied by AGS. Krebs & Riedel will be showing its wide range of grinding wheels.

Visitors to the stand can expect to experience live demonstrations of Advanced Grinding Solutions flagship grinding machines, which are known for their precision, efficiency and reliability. The company's principals will be on hand to discuss the unique features and capabilities of each machine, as well as answering any questions attendees may have about optimising their grinding processes.

Rollomatic machines are the grinding machine of choice for many cutting tool manufacturers and indeed more rotary cutting tools are produced in the UK and in Ireland on Rollomatics than on all other CNC tool grinding machines put together. In fact, over 35 million rotary cutting tools are produced on Rollomatics in the UK and in Eire every year. Rollomatic GrindSmart® machines excel at producing cutting tools from 0.025 mm up to 32 mm in diameter and the superior Swiss manufactured quality of every Rollomatic machine is demonstrated with their industry leading 3-year unlimited hours parts and labour warranty that comes as standard on all new Rollomatic grinding machines.

Rollomatic also supplies a range of special LaserSmart machines for producing CBN and similar tools including its 810XL machine that has 6 CNC Axis and is ideal for machining PCD tools up to 300 mm in diameter.



Receiving its UK debut and being exhibited here for the first time ever is the C-240 EVO filtration system from Comat. This has an oil capacity of 2,000l and has been specified to supply coolant to two Rollomatic grinding machines. Comat Superfiltration systems are engineered to filter neat cutting oil to 2-3 microns, with a classification NAS 1638 – ISO 4406 better than new oil, while constantly maintaining a stable temperature, +/- 0.2 degrees, without compromising filtration or flow rates so to ensure maximum consistency over time. Comat Superfiltration systems minimise the running costs to obtain the lowest cost per litre of oil filtered. The C240 EVO filter unit is the latest generation of compact Superfiltration systems designed to manage multiple machine tools and is able to filter any type of contaminant. Comat is using the Mach show to highlight the growing use of its systems not only for grinding machines but for turning applications as well.

Specialists from Krebs & Riedel will be present on the AGS stand to discuss all grinding applications and best use of their range of internal and external grinding wheels. Krebs & Riedel manufacture high quality conventional, diamond and CBN abrasives and are constantly introducing new types of wheels with improved grain structures and novel bonding systems that enhance grinding wheel quality and optimise performance. Companies involved in grinding are invited to meet the Krebs & Riedel specialists and to discuss their grinding issues and aims to improve their grinding processes.

Tschudin will also be present on the AGS stand to discuss the many advantages that their range of CNC centreless grinding machines bring. These are used to grind parts from 0.1 mm to 250 mm in diameter and for the plunge grinding of parts that are up to 500 mm long. Uniquely for centreless grinding machines; all Tschudin machines benefit from a special design feature with the workrest blade mounted onto its own CNC axis. This patented feature allows for the blade, complete with components, to be transferred outside of the grinding zone for safe and easy loading and unloading of the parts.

AGS
Tel: 024 76 22 6611
Email: info@advancedgrindingsolutions.co.uk
www.advancedgrindingsolutions.co.uk

Stand: 18-328

Latest innovations on show at MACH

At MACH 2024, Leader Chuck International, will present the latest innovations from its Italian partner, Balance Systems in **Hall 18 - Stand 2**, developed to expand the company's range of retrofit solutions for grinding and dressing process optimisation. A team of experts will be available to discuss visitors' needs and describe the benefits deriving from the implementation of these new technologies in machines already in operation.

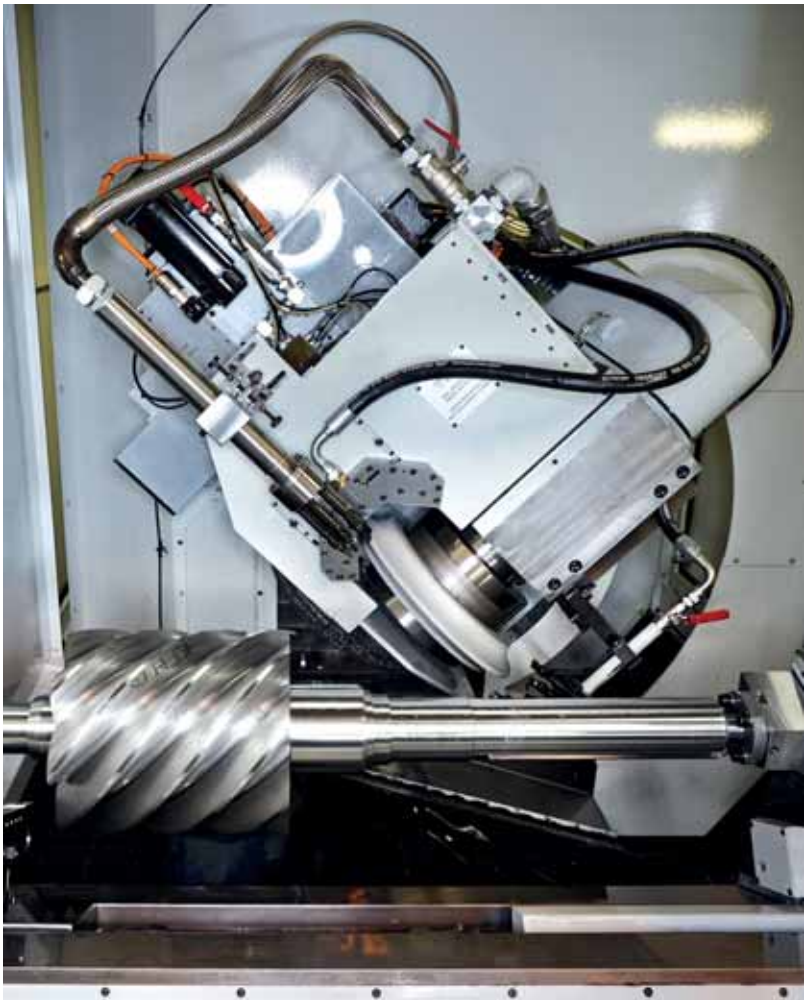
For more than 40 years, Balance Systems' mission has been to provide customisable and easy-to-integrate solutions to optimise almost every grinding and dressing process, allowing the end user to be more competitive by reducing production and maintenance costs and improving the quality of machined parts.

Whether gear, cylindrical, centreless, surface, profile or special-purpose, grinding machines are usually the last step in the manufacturing process. They support most precise geometric characteristics of the part: from dimension, profile, flatness, circularity, cylindricity, conicity, as well as good surface finish. This is why it is important to preserve machine qualities and whenever possible increase their performance.

"Modernisation can increase the profitability of your old grinding machine," explains Mark Jones, managing director, Leader Chuck International. "There are three significant reasons to consider 'retrofitting' your grinding machines; balancing, touch detection and gauging."

Leader Chuck International Tel: 01827 700000
Email: information@leaderchuck.com www.leaderchuck.com

Next level control for PTG Holroyd's helical rotor and thread grinding machines



UK-based PTG Holroyd has announced that, going forward, all models in its TG Series of ultra-precise helical rotor and thread grinding machines will be equipped with the Siemens digitally native SINUMERIK ONE CNC as standard.

PTG Holroyd was the first UK machine tool manufacturer to embrace the benefits of the SINUMERIK ONE CNC, incorporating the control system into its recently launched HG350 range of worm and gear grinding centres. The decision to also use the CNC in its latest generation TG Series machines is a clear indication of PTG Holroyd's commitment to futureproof its technologies.

"The SINUMERIK ONE CNC has brought significant user benefits to our HG350 machines, including class-leading integrated safety and failsafe features, enhanced reporting of machine health and performance data, and uncompromising levels of encrypted security. Factor in the high levels of support we receive from Siemens and it seemed only sensible to migrate to SINUMERIK ONE for our TG Series of rotor and thread grinding machines," comments PTG Holroyd sales director, Mark Curran.

PTG Holroyd's TG Series is widely regarded as setting the industry standard for high speed, high accuracy, efficient stock removal. With the inclusion of the SINUMERIK ONE CNC, the machine tool manufacturer believes its TG range of helical rotor and thread grinding machines will be even more appropriate to its global customer base. Enhanced connectivity is provided via additional PROFINET interfaces, OPC/UA interfaces and increased performance. This is all made possible thanks to a PLC that is 10x faster than earlier Siemens controls. While from a machine tool manufacturing perspective, using the CNC's Create MyVirtual Machine capabilities, in tandem with its own internal design packages, will enable PTG Holroyd's design teams to develop all software and PLC controls on the desktop. "Just as with our HG range, this will reduce lead times significantly," adds Mark Curran. "Avoiding the need to have the physical machine on the shop floor before commencing software development."

Equally suited to prototyping, batch and volume production, PTG Holroyd's TG Series machines are designed primarily for the finish grinding of helical screw components such as worm screws and rotors after they have been milled to a rough or semi-finished state. The TG range starts with the TG50E, a machine designed to precision grind components of up to 50 mm in diameter and 610 mm in length, with models offering stepped increases in capability up to the production of helical components measuring 450 mm in diameter and 2020 mm in length. Each machine's advanced automation means reduced setup time, while a significant amount of production time can be saved due to the fact that diamond dressing discs are continuously dressed during the semi-finish grinding cycles.

TG models offer production rates and accuracies to suit precise manufacturing strategies. Fully automated on-machine probing provides closed loop feedback of corrections to the dresser wheel and does not require a high level of operator skill.

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, pump screws 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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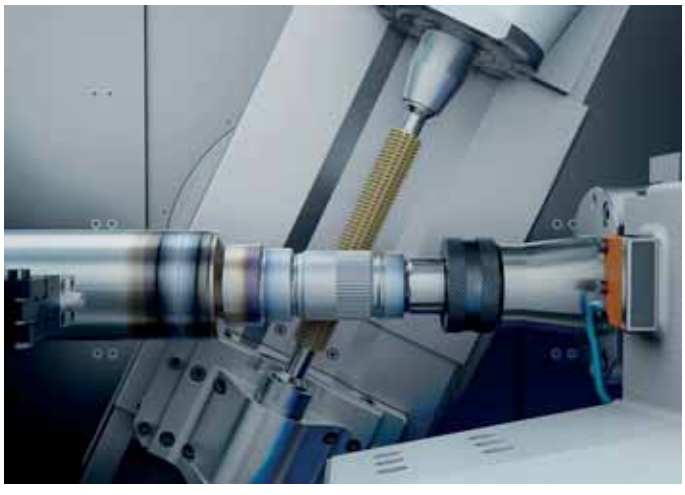
High-precision gear cutting

Machining the teeth of a rotor shaft for electric cars has demanding machining requirements. Very few other applications place such high demands as transmission components. The very quiet motor requires the highest surface finishes so that disturbing running noises do not occur. In addition, the number of units in e-mobility is greatly increasing, which is an additional challenge for the mechanical engineering involved. What is needed, therefore, are process-reliable solutions for cost-effective rotor shaft production. EMAG Koepfer HLC 150 H gear hobbing machines demonstrate how this can work, ensuring new productivity in this gear sector.

The fact that electric cars don't have any transmissions is just a myth, but one that persists quite stubbornly in the public eye. It assumes that the electric motor does not require any gear ratio given its stable torque. In practice, however, it is usually the case that a so-called 1-speed gearbox is used, which helps reduce the speed of the electric motor by a certain factor. As a result, there are numerous gearing elements on components such as the drive shaft, rotor shaft or axle drive and their component quality must be exceptional so that, for example, there are no loud running noises. These would be audible given the quiet electric motor.

High gear quality scores

In this context, the technology of EMAG is grabbing the attention of



production planners. For many years, the specialists have been developing highly versatile mechanical engineering solutions for machining a huge range of workpieces, from gear shafts to steering pinions and worm gears to planetary gears; an ideal experience base for providing highly efficient solutions for the gear cutting of rotor shafts as well. The HLC 150 H gear hobbing machine is one of the focal points here, offering a high level of productivity for components with a maximum length of 500 mm and a weight of 10 kg. First of all, the milling head ensures this. It is very rigidly suspended and moves completely during machining. The shift axis is made up of the interpolation of two axes. In this way, a large milling head swiveling angle is realised with a large shift path at the same time. As a result, gear hobbing is very smooth and the gear quality is high. The horizontal arrangement of the workpiece also prevents chip clusters from forming. In the end, this technology ensures enormous performance figures in the machining of rotor shafts with cycle times of only 35 seconds at a gear quality of DIN Q7.

Can be integrated into the line

On this basis, the machine builders plan and develop complete lines for the rotor shaft in which all machining processes are perfectly linked one after the other, from the soft machining of the blanks to the final hard machining, including the tooth flank grinding processes or skiving hobbing. The HLC 150 H is also used here, which is no problem in view of its integrated high-speed gantry loader. It picks up the components from EMAG's own TrackMotion system, which in a sense drives through the machines on the line.

K 160 in use with two-piece rotor shafts

EMAG has the K 160 gear hobbing machine, a solution for components with a maximum length of 300 mms and a weight of 2.5 kg, which is particularly interesting for assembled rotor shafts, because their individual parts are relatively small and light, before joining. At the same time, this machine can also be integrated into EMAG lines or largely automated. In any case, the high vibration damping ensures long tool life and high surface finishes. Maximum motor speeds at the milling head and main spindle result in high cutting speeds even for shafts with small numbers of teeth.

Overall, EMAG sees itself well equipped for the growing e-car boom. When it comes to setting up high-volume production in this area, the gear experts offer highly efficient solutions that can be integrated into the manufacturing flow in very different ways. This approach is highly interesting for any production planner and not just with a view to the rotor shaft.

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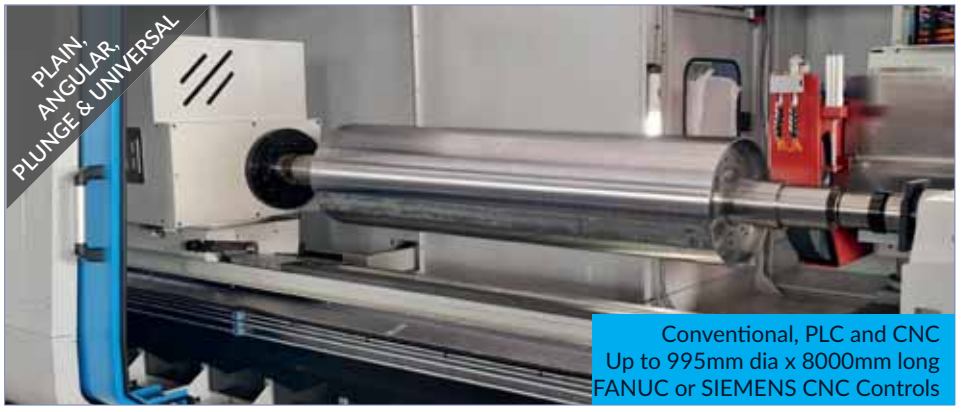

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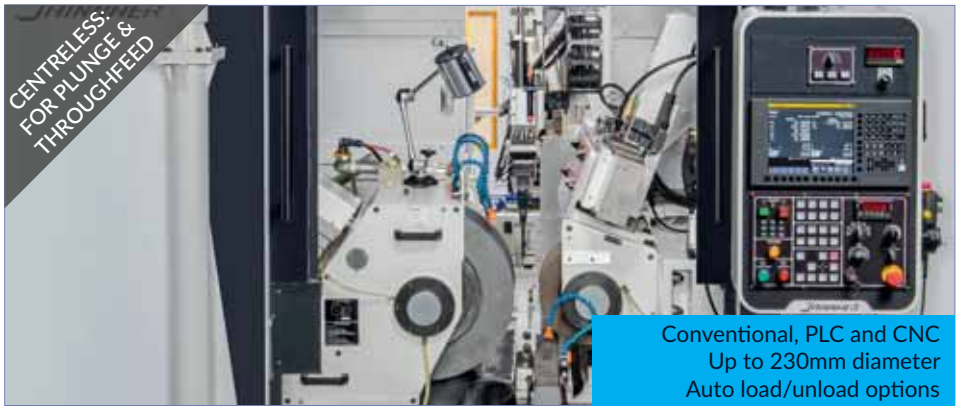

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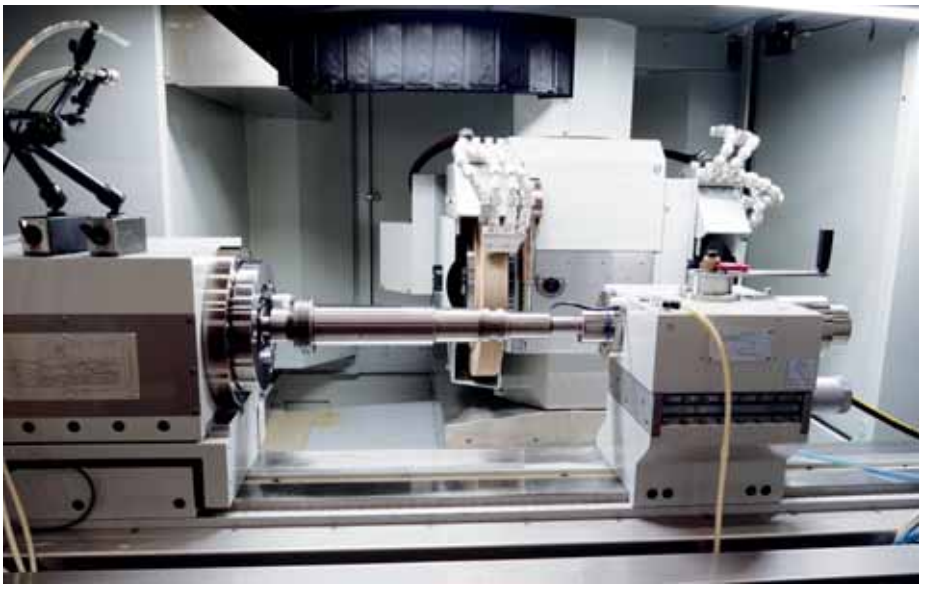
High precision cylindrical and non-circular grinding

For 50 years, the Dutch manufacturer of portal milling machines and machining centres Unisign has been producing machine concepts that are constructively adapted to special machining requirements. An in-house production depth of over 80 percent ensures that the know-how remains within the company. Among other things, all workpieces requiring high precision are manufactured in-house. In the field of grinding, the company relies on the Swiss grinding machine specialist Kellenberger.



When Bart van Ruth founded his design office exactly 50 years ago, he had the goal to find technological solutions for productivity improvements. The development of his first own product, a vertical, column-moving CNC drilling machine with a fixed machine bed, brought success especially in the German market. In 1988, the first gantry milling machine for five-sided machining of workpieces was presented.

Today, Unisign portal machines, travelling column machines and multitask machining centres go to logistics and energy companies, commercial vehicle manufacturers and general engineering all over the world, a large proportion of them as special machines. The range of parts machined on these machines includes truck front and rear axles, chassis side rails, lift mast profiles, excavator frames, crane beams and railroad bogie frames, which are often produced in a single clamping operation on Unisign machines. The machining length of the machines often exceeds 25 m, understandable in view of these workpieces. Among other things, pumps and valves for the oil and gas industry and sophisticated components for energy plants such as turbines or wind power plants are machined on Unisign machining centres.

Innovative technologies have always played an important role for Unisign. This tradition is continued by Paul van Ruth, who has been managing the company in the second generation since 2008. The Unisign Technology Centre houses a research and development department where new machine concepts that offer solutions for special machining problems are continuously developed. The production and assembly hall, which is also located there, is often used for test machining for customers.

"Here, we can impressively demonstrate the performance of our machines," says operations manager Paul Lennaerts, who is responsible for design, production, purchasing and assembly. The mechanical engineer has been with the company since 1991 and worked in customer service for a long time initially. "We show customers how

our machines can increase productivity in a manufacturing operation," Paul Lennaerts continues. "In our own production, we manufacture the components for our machines mainly on Unisign machines, at least that goes for the turning, milling and drilling processes. For other machining operations, we use machines from manufacturers whose quality awareness is similar to ours, as we experience with Kellenberger, for example."

For grinding operations on high-precision parts such as tie rods, mandrels and spacer rings, a Kellenberger KEL-VARIA, the predecessor model of the premium KELLENBERGER 1000 series, with HEIDENHAIN control, was purchased back in 2003. The performance spectrum of these machines is oriented to the high demands of precision production of prototypes as well as small and medium series. A solid machine table with a reinforced machine bed brings very high static and dynamic rigidity and stability, both decisive factors for the highest machining and surface quality, high precision and great productivity.

In 2021, another Kellenberger grinding machine, a KELLENBERGER 1000, was purchased, partly for capacity reasons and partly due to the growing performance requirements. René van der Peet from the sales company BMT Machine Tools BV, which has been representing the Kellenberger, Hardinge and Bridgeport brands belonging to the US Hardinge Group in the Netherlands for many years, acted as specialist consultant in this case. He expertly guided the selection process for the new machine. "We weigh all parameters very carefully when buying a machine and leave nothing to chance," says Paul Lennaerts. "Our workpieces vary greatly in size and type of machining and we mainly machine small batches and individual parts, which means the machine must be very flexible, plus ensure high production and process reliability."

The KELLENBERGER 1000 is equipped with hydrostatic guides in all main axes for maximum form accuracy in grinding tasks with interpolating axes. The CNC-controlled B-axis for the grinding head is hydrostatic and thus wear-free. It has a direct drive with water-cooled high-torque motor and angle encoder with 0.1" resolution. The turret grinding head thus swivels about three times faster and positions with an accuracy of less than one angular second. This reduces non-productive times and increases productivity, especially when machining requires the swiveling in of different grinding wheels.

From the optionally available centre widths of 1,000/1,600 mm and centre heights of 200/250 and 300 mm for the KELLENBERGER 1000, they decided on a machine with a 1,600 mm centre width and a centre height of 250 mm. "The KEL-VARIA also has these dimensions. We make full use of the working space when grinding long mandrels," says Paul Lennaerts. Of the more than 30 different grinding head variants with external and internal grinding spindles that are available as standard for the KELLENBERGER 1000 and cover every machining requirement, Unisign chose the UR 1-6-7 grinding head arrangement with an external grinding spindle and two high-frequency internal grinding spindles with speeds of max. 42,000 rpm and 60,000 rpm, respectively.

The purchase of the KELLENBERGER 1000 was well prepared with various grinding tests at the Kellenberger factory in St. Gallen. Among the acceptance parts were Capto C8 receptacles. These receptacles are among the parts that Unisign manufactures in-house. The necessary grinding know-how for the Capto toolholders was supplied by Kellenberger together with the machine after the grinding tests.

The KELLENBERGER 1000 is equipped with a HEIDENHAIN GRINDplus640 control and the Kellenberger RED Solution software, which includes a GRAPHIC Guide for program creation based on 2D component drawings incl. DXF import, as well as support by form and technology editor and the program sequence visualisation ICON-Guide for free program design based on ISO. The latter is required for non-circular as well as profile grinding, e.g. threads. Additionally, the HEIDENHAIN non-circular grinding module was purchased.

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Custom tool maker successfully transplants expertise to surgical instruments

Guided by the motto: "Simplify tooling to deliver productivity," Tru-Edge, based in St. Henry, Ohio, USA, has long been a leader in manufacturing and re-sharpening custom crafted round tools in several industries, including aerospace and automotive. Its success in these industries stems from its expertise in tight tolerance carbide grinding, an experienced tool design team and a technical sales staff that knows how to solve problems "at the spindle." While the company has carried on this tradition since 1996, it has added a new capability in 2007.

That year, several big orthopaedic customers in the Warsaw, Indiana area contracted with Tru-Edge to produce hip broaches, bone rasps, bone graft drills, reamers and taps all of which are typically stainless-steel tools with entirely different geometries than the metal cutting tools they were accustomed to manufacturing. The team embraced the challenge and made it a key part of Tru-Edge's business, earning both ISO 9001 and ISO 13485 certification and adapting to customers' changing demands in the years that followed. Vice president Brian Hackman reports that surgical instruments now represent 10 percent of its total sales, even as the company continues to grow rapidly.

Speedy automation is one reason Tru-Edge makes its medical customers happy. Here, one robot gripper on an ANCA MX7 removes a finished surgical instrument just before its twin swings down to load the next blank

Sticking with ANCA machines

From the beginning, ANCA tool grinders represented Tru-Edge's primary production equipment and their inherent flexibility made them a perfect fit for the new line of business. Brian Hackman states that for the first 14 years or so, the contracts called mostly for reusable instruments, with the ultimate customer being major hospitals that had the ability to sterilise the instruments. He says: "They wanted the tools to be as visually appealing as they could possibly be. Tru-Edge produced tools had a jewel like appearance, due to the highly polished surface finish and complex geometries. The different facets and reliefs we would grind in them would literally sparkle."

Fully automated tool grinders and trays filled with upcoming jobs offer a window into the long-standing partnership between ANCA and Tru-Edge

By optimising wheels, plus the speeds and feeds on their ANCA TX, MX, and FX machines, Tru-Edge was also able to deliver a burr-free finish that virtually eliminated the need for post-processing. This contributed to even more business and an award from the regional manufacturing association in 2018.

Tru Edge credits its success, in part, to innovations in ANCA's Toolroom software and the incorporation of linear motors. Rick Brunswick, engineering manager at Tru-Edge, points to ANCA's in-process wheel dressing capabilities as a key ingredient to maintaining tight form tolerances, especially on medical taps, while also reducing cycle time and the number of operations. He prefers ANCA's approach to outfitting a machine with a large 250 mm dressing roll around the work head, rather than the optional

side-mounted dresser. He explains: "It lasts much longer, because you have more surface area on that diamond dressing roll than you would with a smaller dressing roll that's off to the side."

Automation solutions

By 2020, customer requirements started shifting dramatically toward single use instruments, owing to a corresponding explosion in the number of orthopaedic surgeries occurring in smaller outpatient medical centres, facilities that are generally doctor-owned. Demand for a simpler, functional tool at the lowest cost, replaced the need for a visual showpiece. Thus, the primary material changed from 17-4 stainless steel to various other types, such as 455, 465, etc, which have a different surface finish and tend to produce more burrs, so it takes more time to deburr the parts.

As one might expect, the switch to single use instruments also increased production volumes exponentially. Brian Hackman adds: "Ten years ago we were doing six-, eight- and ten-piece orders. We had an 11,000-piece order last July and still have the technology, the innovation and the knowhow to provide a burr-free, beautifully finished part. But now we have to manufacture them by the thousands, instead of by the fives and sixes."

Once again, ANCA fit the need. For example, with robot loaders and automatic wheel changing from a 6-position carousel on the MX machines, Tru-Edge is able to run lights-out. Another contributor is the traveling steadyrest, riding on what ANCA calls the P-axis. Long, thin surgical cutting tools tend to bow, but Tru-Edge developed part-specific bushings that, in conjunction with the steadyrest, force the tool into a perfectly straight setup for the grind. As such, a single MX can produce 5,000 small diameter surgical drills per month.

Tru-Edge relies on ANCA's traveling steadyrest and part specific bushings to keep tools perfectly straight during the grind

Automating femoral rasp production typically involves both an automatic collet chuck and a swing-out tailstock to secure the other end, these rasps vary widely. Brian Hackman continues: "Some are long, skinny and very concentric. Others are more crooked, like a dog's leg. So, we had to develop part specific tailstock fixturing to allow different shapes to be held on centre."

Metalworking tools, like this carbide ball nose endmill, account for most production at Tru-Edge

Tru-Edge makes its own fixtures at a sister company, MetalCut Tool Services, based in Dayton, Ohio, USA.

These parts are typically designed in Siemens NX and ANCA provides a post-processor to create the necessary machine motions. After importing this file, ANCAam gives the operator the ability to manage specific process parameters, like speeds and feeds, offsets and wheel selection and dressing cycles. ANCA's CIM-3D package offers a full simulation to verify the grinding motion and to compare the expected part with the original model.

With engineering, design and manufacturing all under one roof, Tru-Edge leveraged its partnership with ANCA to reduce cycle time, remove supply chain pain and reduce the end-users' total cost of ownership.

Bright future

Brian Hackman foresees continued growth in the medical instruments market as baby boomers continue to age and the trend of patients seeking care at smaller surgical centres continues. He believes that Tru-Edge's embrace of automation positions them to be: "The premier supplier to the industry for that niche market." In fact, its orthopaedic customers have made Tru-Edge their sole supplier for instrument grinding.

Along that line, Tru-Edge's next project is further automating bone rasp production. That advance would grow the company's medical business 10-15 percent, eliminating the need to buy another 4 machines and hire enough staff in today's tight labour market to hand load these complex parts.

At Tru-Edge, the future is bright because the company has expanded its capabilities and managed growth with surgical precision.

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Mass finishing & shot blasting for medical and aerospace applications

By Colin Spellacy, head of sales for Rösler UK

In the precision-driven realms of the medical and aerospace industries, the roles of mass finishing and shot blasting technologies cannot be overstated. These processes, crucial for achieving the high degree of surface perfection required in these sectors, are instrumental in ensuring both the reliability and safety of critical components.

This article delves into the intricate world of mass finishing and shot blasting, exploring their application in the medical and aerospace fields and underscoring why these technologies are indispensable for maintaining the stringent quality standards that these industries demand. By examining their impact on product durability, performance and compliance with rigorous specifications, we gain insight into how these finishing processes are not just about aesthetics but are fundamental to the functionality and integrity of the components used in life-saving medical devices and high-performance aerospace systems.

Mass finishing and shot blasting

Mass finishing and shot blasting are two distinct industrial processes used for surface finishing of components, each with its unique method and application. Mass finishing, encompassing techniques like tumbling, vibratory finishing and centrifugal finishing, involves placing parts in a machine with abrasive media, where they are finished through a combination of mechanical and chemical actions. This method is particularly effective for deburring, smoothing, polishing and cleaning a large number of small to medium-sized parts simultaneously, making it ideal for intricate components with complex geometries. The gentle and controlled nature of mass finishing ensures uniform treatment of all surfaces, crucial in industries like medical, where precision and consistency are paramount.

Shot blasting, on the other hand, employs the forceful projection of abrasive materials, such as steel or glass beads, against the surface of the component. This high-energy process is excellent for cleaning, strengthening, peening, or roughening surfaces and is often used for larger, more robust components. Its aggressive nature makes it suitable for removing heavy scale, rust, or old coatings and it is commonly employed in industries like aerospace and automotive for preparing surfaces for painting or coating. The choice between mass finishing and shot blasting depends on the specific requirements of the application: mass finishing is preferred for delicate, precision parts requiring uniform treatment, while shot blasting is chosen for its aggressiveness and suitability for larger, tougher components needing thorough surface preparation.

In the medical industry, mass finishing, prior to final sterilisation in accordance with applicable medical regulations, is essential for ensuring the safety and effectiveness of various devices. The

process is widely used to smooth and polish implantable devices, surgical instruments, and other medical tools. The primary objective is to eliminate any surface irregularities that could harbour bacteria or cause patient discomfort. For instance, mass finishing is vital in the production of orthopaedic implants, where a smooth surface can significantly reduce the risk of tissue irritation and promote better integration with the body. Additionally, the process is used to clean and finish components of diagnostic equipment, ensuring that they are free of contaminants and safe for patient contact.

Shot blasting, in the context of the aerospace industry, is crucial for preparing component surfaces for further processing and ensuring their structural integrity. This process is extensively used for cleaning, texturizing, or peening surfaces of aircraft components made of metals and alloys. By removing surface contaminants, shot blasting enhances the adhesion properties of subsequent coatings, which is critical for parts that are exposed to extreme environmental conditions. Moreover, shot blasting is employed for stress-relieving and strengthening components through peening, a process that improves fatigue resistance and prolongs the lifespan of critical aerospace parts such as turbine blades, landing gear, and fuselage components.

The importance of mass finishing and shot blasting in these sectors is underscored by their direct impact on safety and performance of safety-critical devices. In the medical field, the precise and gentle finishing of devices ensures device efficacy. In aerospace, the reliability and durability of components are non-negotiable, with shot blasting playing a pivotal role in ensuring these attributes. These processes not only contribute to the longevity and functionality of components but are also integral in complying with stringent industry standards and regulations, thereby upholding the highest safety benchmarks in these critical sectors.

How to select a finishing supplier

To excel in providing top-tier mass finishing and shot blasting technologies, a company must possess a blend of advanced technical capabilities, extensive industry knowledge and a commitment to innovation. At its core, the company should be equipped with state-of-the-art machinery and technology capable of handling a diverse range of materials and component geometries. This includes having a variety of mass finishing machines like tumblers, vibratory finishers and centrifugal equipment, as well as an array of shot blasting machines suited for different applications, from gentle peening to aggressive surface cleaning. Equally important is the company's expertise in selecting the right media, whether it be ceramic, plastic, or metallic for mass finishing, or the appropriate abrasives for shot blasting, to achieve optimal results. In addition, the company should demonstrate an ongoing investment in R&D, ensuring that its technology stays at the forefront of industry advancements, thereby offering the most efficient, cost-effective and environmentally-friendly solutions.

In addition to technical prowess, the ideal company should have a strong customer-centric profile, marked by a deep understanding of various industry requirements and a tailored approach to each project. This means not just selling equipment, but partnering with customers to understand their specific needs, whether they are in the aerospace, medical, or any other sector with stringent finishing standards. Such a company would offer comprehensive services, from initial consultation and process development to after-sales support, including maintenance and training. The ability to provide custom solutions and adapt technology to unique challenges is crucial, as is a robust global support network that ensures customers receive timely assistance regardless of their location.

By combining cutting-edge technology with personalised, industry-specific service, a company can truly deliver the best in mass finishing and shot blasting technologies, becoming a trusted ally in their clients' pursuit of excellence. This customer-focused approach should be backed by a strong commitment to quality and safety, ensuring compliance with international standards and regulations. A provider excelling in these technologies would also prioritise sustainability, continually seeking ways to minimise environmental impact, such as by developing eco-friendly media and optimising energy efficiency in their machines. Ultimately, the hallmark of a leading company in this field is its ability to merge technical expertise with a responsive and responsible service ethos, setting the standard for innovation, reliability and customer satisfaction in the realm of mass finishing and shot blasting technologies.

The Rosler difference

Rösler AG, with its illustrious 80-year history, stands as a paragon in the field of mass finishing and shot blasting, particularly for the demanding applications required in the medical and aerospace industries. This longevity is not just a testament to the company's enduring presence but also to the depth of experience and expertise it has cultivated over the decades. Being a family-owned business rather than a shareholder-driven entity, Rösler has the unique advantage of prioritising long-term goals and customer-centric strategies over short-term financial gains. This approach has allowed the company to build lasting relationships with clients, understand the evolving needs of the industries it serves and adapting its offerings accordingly. Röslers' deep-rooted understanding of the nuanced requirements in the medical and aerospace sectors has positioned it as a trusted partner, capable of meeting the highest standards of precision, reliability and quality demanded by these fields.

The global sales and service support infrastructure of the company is a critical component of its success. Its widespread presence means that it can offer localised expertise and support, understanding regional specificities and responding promptly to customer needs, regardless of location. This global network ensures that customers receive consistent, high-quality service and have access to Rösler's expertise no matter where they are based.

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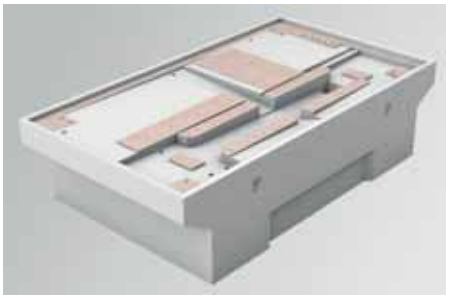
Grinding of coated brake discs already successfully in use

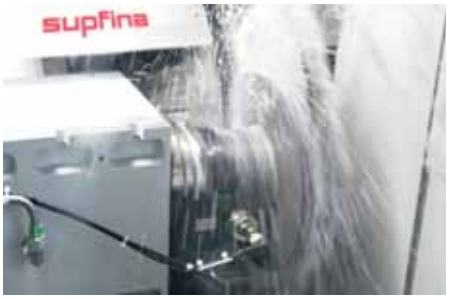
The automotive industry is facing significant change, driven by constant innovation and stricter environmental regulations. In this dynamic environment, Supfina has taken on a key role. With the introduction of the Supfina Planet BD, a specialised system for grinding hard-coated brake discs, the company is setting new standards in precision and efficiency. The Supfina Planet BD is already being used successfully and is highly valued by renowned customers.

The need for such an innovation was reinforced by the introduction of the Euro 7 emissions standard. Hard-coated brake discs, which make a significant contribution to reducing particulate emissions and at the same time provide the necessary corrosion protection for electric vehicles, became the focus of attention. Supfina responded to this challenge by developing an economical solution for the double surface grinding of brake discs in collaboration with brake disc manufacturers and coaters. This solution takes the entire process chain into account and precisely coordinates the grinding process with previous work steps.

The Supfina Planet BD has a patent-pending, force-neutral grinding process that enables a significant improvement in shape and position tolerances. This method not only optimises tool life, but also significantly reduces unit costs. In addition, the mineral cast machine bed contributes to the high precision by providing excellent thermal stability, vibration damping and chemical resistance to cooling lubricants.



Mineral cast machine bed with excellent damping behaviour



Grinding process for hard-coated brake discs - Supfina Planet BD

The Supfina Planet BD already successfully in use

The Planet BD is characterised by its specific adaptability to the grinding of coated brake discs. Its extreme rigidity and vibration damping enable short cycle times and ensure economical tool wear with maximum precision and accuracy. In addition, loading and unloading can be automated for different infeed and outfeed systems, which enables smooth integration into different manufacturing processes and leads to further cost savings.

In conclusion, the Supfina Planet BD is a pioneering solution that has already achieved a high market response. The machine combines technological innovation with a precise design to meet today's demands in brake technology. Its ability to improve both performance and sustainability makes it a relevant contribution in a rapidly evolving sector. This suggests that the Supfina Planet BD not only offers an answer to current challenges, but also has the potential to influence standards in the future of brake system manufacturing.

With locations in Germany, the USA and China, Supfina Grieshaber is a leading solution provider and manufacturer of surface finishing equipment. The company employs more than 200 qualified and highly specialised people. The product range includes machines and equipment for superfinishing, double side grinding, fine grinding, flat finishing, as well as automation solutions. Based on decades of experience, the modern company offers integrated and innovative systems including comprehensive services.

Supfina Planet BD for grinding hard-coated brake discs

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New level of automation for robotic sanding with the Mirka AutoChanger

Mirka is introducing a new component for automated sanding. Developed with the operator in mind, the Mirka AutoChanger is a smart robotised solution for reliable replacement of abrasives in an automated process.

Mirka's AutoChanger system has been developed for the instant replacement of Mirka abrasive discs in a robotised sanding process, to work together with Mirka AIROS 650CV and AIROS 350CV sanding heads. Available for both 77 mm and 150 mm abrasive discs, the safe, modular and intuitive Mirka AutoChanger is a natural part of a Mirka Automation robotic sanding system.

Coupled to the Mirka AutoChanger, the robotic sanding head is programmed to pick up a new abrasive from the AutoChanger magazine loaded with abrasive cartridges. After performing the sanding operation for the specified number of times, the sanding head discards the abrasive using a special remover, again replacing it with a new abrasive. The sanding process is constantly repeated with a fresh abrasive without fault.

The Mirka AutoChanger system has a modular construction. This provides unparalleled flexibility in integration, with a seamless fit for both new and existing robotic sanding solutions. It can be customised to fit the unique needs of the sanding application. Suitable for dry sanding with both net and multihole abrasives, a correctly set up Mirka Autochanger system provides an industrial sanding process with perfect sanding results, time after time.

With decades of experience, Mirka is a leader in surface finishing technology. It offers a wide range of solutions for surface finishing and precision sanding. The company specialises in total solutions in which the abrasives are supplemented by its innovatively designed machines and polishing compounds.

The company's knowledge and expertise

enables it to find the right combination of abrasives, tools and polish for a specific purpose, but it also identifies the customer's needs. It forms a relationship with the customer and works in collaboration with them on every aspect, to understand and address the whole picture and give them the solution to reach that perfect end-result.

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A wholistic approach to gear grinding

by Walter Graf, senior project manager, Reishauer AG, Switzerland

This article explores the rationale behind a grinding machine tool builder's decision to provide a full suite of offerings, encompassing tooling such as grinding wheels, dressing tools and clamping fixtures alongside process monitoring and automation, highlighting the most pivotal elements. The term "wholistic" refers to a methodology that integrates various parts into a unified whole, producing results surpassing the sum of its elements. This concept is graphically represented by Reishauer's "Circle of Competence," epitomising gear grinding technology as shown in illustration 1.

Illustration 1: Circle of Competence

Central to the Circle of Competence is the Reishauer generating gear grinding machine, the Rzx60, renowned for its dual spindle configuration. This design has been validated by the global installation of over 1,000 machines. Yet, the expertise extends beyond machinery; Reishauer has augmented its range with automation solutions, grinding wheels, dressing rolls, and clamping fixtures to oversee the grinding process comprehensively and ensure accountability. The foray into digital services, notably ARGUS, process monitoring, represents the latest enhancement to the Circle of Competence. Consequently, Reishauer can assume complete accountability for the stability of the gear grinding process. The seamless interaction of these elements is critical for achieving optimal machine performance, embodying the commitment to overseeing the entire process chain, thus ensuring the uninterrupted operation of the Reishauer gear grinding machine.

Process monitoring and grinding wheel development

The ARGUS process monitoring system enables end-users to refine their production control by evaluating grinding intensities, among other factors. "Grinding intensity" in the ARGUS system is a force model to calibrate and standardise the grinding forces. The force model considers the continually changing chip forming zone, including the local cutting kinematics during changes in the grinding wheel diameter and the changing grinding condition due to variations in wheel RPM. This standardisation and calibration allow the setting of very narrow envelop thresholds, which can be detected and automatically evaluated during the process. Illustration 2 shows a typical progression of a 2-step grinding intensity signal as it appears on the machine tool's CNC monitor. The higher dark blue area on the left corresponds to the roughing pass and the lower dark blue area on the right corresponds to the finishing pass. In terms of grinding wheels, ARGUS uses grinding intensities to facilitate the empirical analysis of grinding tools throughout their lifecycle for each workpiece processed. Traditionally, the evaluation of grinding wheels was largely subjective. Today, ARGUS enables a scientific examination, as demonstrated by the visualisation of grinding intensities of over 5,000 workpieces, as shown in illustration 3. This evaluation is fed back to the grinding wheel development department, allowing for continuous quality control and further development.

Illustration 2: Grinding intensities

The upper grinding intensity limit of the roughing grinding pass is set at 55, while the process runs at an intensity of 48. For the finishing pass, the upper limit is set at 33, with the process running at an intensity of 25. Hence, roughing and finishing are well within limits. The workpiece is automatically removed from the production cycle if the roughing or the finishing limits are exceeded. The limits are either suggested by the process monitoring system during the process setup, based on statistical analysis, or set by users who may have made their own experience over time and many production lots. These limits allow 100 percent real-time quality control. This analysis differentiates between the roughing and finishing strokes, showing a decrease in intensity during roughing, indicative of wear on the threaded grinding wheel and an increase in intensity during finishing, compensating for earlier reduced material removal. Such findings underscore the microscopic degradation of the wheel's bond-grain matrix, necessitating adjustments to the grinding wheel specification to stabilise the process.

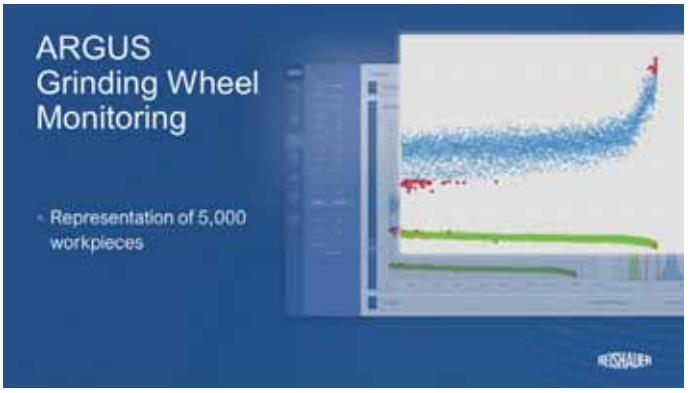

Illustration 3: Grinding wheel monitoring

Evaluating clamping fixture performance

As for grinding wheels, ARGUS can also assess the clamping tools' effectiveness. Monitoring the grinding intensity provides insights into the roundness levels of clamping fixtures or deviations in pre-machined workpieces. In this example, roundness differences between the two workpiece spindles, C1 and C2 can be observed, as shown in illustration 4. ARGUS employs advanced algorithms to simplify the interpretation of dynamic effects on grinding intensities, facilitating a process analysis without needing specialist expertise. In this specific case, spindle C2 was clocked improperly, leading to higher intensities due to the out-of-roundness. After clocking C2, both spindles showed an identical range of grinding intensities, as shown on the right of the graph in illustration 4.

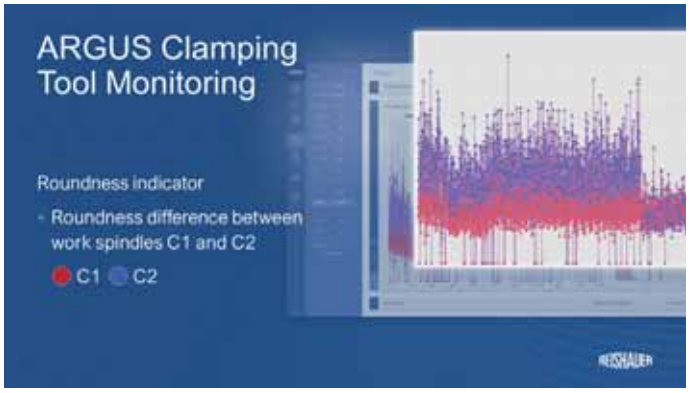

Illustration 4: Clamping fixture monitoring

Evaluating diamond dressing tools

ARGUS also allows an analysis of the wheel dressing process, giving insights into the dressing tool performance and tool life.

Illustration 5 depicts the conventional diamond dressing process and its impact on wear zones, highlighting the benefits of increased homogeneity through proper dressing techniques. This insight leads to a significant reduction in dressing cycles and extends the life of both the diamond roll and the grinding wheel, thereby enhancing efficiency and reducing environmental impact. Again, these insights help the diamond roll department continuously improve the tooling.

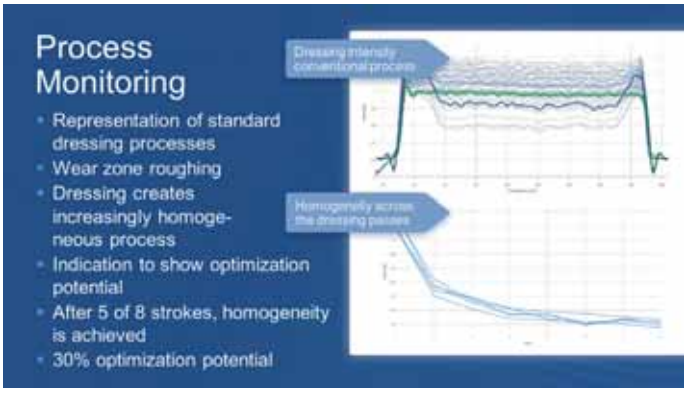

Illustration 5: Diamond dressing roll monitoring

Conclusion

Adopting a comprehensive approach to gear grinding offers significant advantages, from enhancing tooling and process parameters to achieving superior quality levels. Machine tool suppliers can significantly optimise the production cycle through an integrated and wholistic strategy, benefiting all stakeholders.

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Leading the way in superabrasive finishing systems

The Hyprez® System from Engis offers a complete solution, machine, accessories, consumables and process development, for the most demanding surface finishing needs.

Engis is a leader in the design and manufacture of complete lapping and polishing systems that offer the highest quality finished components, processed in the quickest cycle times while minimising manufacturing costs. But the machine is just one part of the process. What really sets it apart from the competition is its unique ability to provide process development and customer support that is second to none.

Its systems are suitable for processing a vast range of materials including metals, ceramics, glass, semiconductor substrates, plastics and other advanced materials. It has developed solutions for many industries, improving quality, efficiency and cost.

Hyprez lapping plates

Engis manufactures a complete line of lap plates, including metal composite, solid metal, and fixed abrasive options. Its applications experts can recommend the best lap plate for your application. An efficient lapping operation requires the selection of a proper lap plate. This selection is guided by the process objective, stock removal, fine finish, the material being lapped and the diamond size/type used in the lapping slurry.

A composite lap plate is comprised of metal or ceramic particles in a resin matrix, allowing for efficient charging of diamond abrasive particles into the plate. This charged composite plate can significantly reduce process times and achieve a finer surface finish, often in a single step. A composite plate is also well suited for a facing device, taking the guess work out of flatness and texture control.

The company began in 1938, with offices in the US and UK, as a trading company for precision measuring equipment and industrial machinery. The company entered into the abrasives market in the 1940s with the development of its Hyprez diamond compounds for precise polishing of critical components for defense and aviation industries. Since that time, Engis has expanded its range of superabrasive products, applications, and industries served to be recognised as a leader in superabrasive finishing systems.

Its 131,000 sq ft headquarters and manufacturing facility in Wheeling, Illinois, is located 15 miles north of Chicago's O'Hare International Airport in the USA. To provide sales, technical, and logistical support for multinational and foreign customers, Engis has established subsidiary companies located in Canada, the UK, Japan, Korea, Singapore, Hong Kong, and China, supplemented by a worldwide network of agents and distributors.

Engis products are developed, customised and supported by teams of experienced research scientists, design and application engineers.

Its process development labs provide proven results for challenging and difficult applications in addition to providing customer training. Combined with its consumable products and machinery tailored to meet your requirements, the Engis systems approach provides assurance of cost effective and consistently repeatable performance.

It takes pride in its employees in their skills and accomplishments. Its goal is to provide a safe workplace where people can have a sense of purpose and pride in what they do.

The company has been fortunate to attract and retain talented employees who have spent almost their entire careers at Engis. The company is also committed to develop and train a new generation of employees.

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High-tech polishing since 1982

LAM PLAN, based in Gaillard, France, has been elaborating and manufacturing products for polishing in the industry since 1962. The company has built and enviable reputation as a real specialist in all the polishing technologies, providing its customers with its scientific competences and technical know-how to accompany them in a finer control of their lapping and polishing problematics.

From research and development to the implementation of recommended high performance abrasive solutions, its teams deploy each day throughout the world an effective and friendly process with respect to environmental problematics.

The polishing technology requires not only high-quality products, but also methods and an impeccable service.

LAM PLAN manufactures all the equipment necessary for the production of customer parts. Its core customer service includes:

Design of lapping supports

Plates, abrasive papers, polishing cloths; all the supports which make it possible to obtain the required results.

Design of abrasive solutions

Conventional and diamond abrasive pastes and liquids and formulations adapted to your requirements.

Polishing

Manufacture and maintenance of moulds and toolings intended for sectors of activity such as plastic injection, jewellery, eyeglass trade, forge (coins, medals), wireworks.

Polishing methods

Development of the process that will allow you to obtain the exact required surface finishing.

Lapping

Manufacture of industrial valves and fittings and relief valves intended for sectors of activity such as chemistry, petrochemistry, nuclear.

Manufacture and maintenance of mechanical seals for the refurbishment of pumps intended for aeronautical industry, petrochemistry, agro-food industry, hydraulics.

Manufacture and polishing of the part entering in a mechanical system intended for precision optics, optical mirrors, glass industry, electronics, read head, electromechanics, sensors, watchmaking industry, laser disc.

Metallography

Polishing of metallographic samples in view of research work on materials or production control work in sectors such as aeronautics, automobile, nuclear.

The LAM PLAN technical team addresses all challenges and attempts to respond to specific issues in a simple way, that remains safe and comfortable to handle.

Environment

LAM PLAN is pursuing and maintaining its research and development efforts in favour of the technique and the environment. Its innovations contribute to the improvement of its products and technologies by rendering them more effective, while reducing their impact on the environment and limiting the risks to user health.

This responsible and intentional approach is an integral part of its continuous improvement policy. The choice allows its customers today to anticipate international regulations in terms of occupational safety and ecology. Thanks to its developments, LAM PLAN is committed to offering you innovative products which allow reconciling performance, quality, safety and respect of future generations.

By way of its values, it asserts its commitment to responsible and sustainable business practices.

Quality products

Strengthened by its experience and the requirements it imposed on itself, LAM PLAN markets high-quality, reliable and high-yield products. Among its customers, LAM PLAN is honoured to have 39 of the first 40 French Industry Companies.

LAM PLAN directs all its efforts and research toward the development and manufacture of products anticipating the evolution in health and safety rules for both the respect of user health and the preservation of the environment.

M.M.8400

The M.M.8400 machine combines lapping and polishing equipment which enables you to integrate a means of flat surface finishing into your workshop, at a reasonable price.Its compact size and ergonomic controls facilitate its installation and use.

The simple tried and tested design, equipped with medium dimension plates, enables you to cost effectively produce small runs.

Equipped with either a cast iron plate, DIALAM®, LAM PLAN M'M' or FAS®, this range of machines lets you achieve any type of surface finish defined by your specification, e.g. lapping, stock removal, grinding, polishing.

The process is controlled via a touchscreen, which ensures good ergonomic and intuitive use. This range of machines also gives you the possibility of saving programmes, assuring repeatability of lapping/polishing processes implemented in your workshops.

This range of machines is compatible with the new LAM PLAN 709, 710 and 719 distribution systems managed directly from the machine's control panel.

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20 years of HELITRONIC VISION

Last year, Walter celebrated the 20th anniversary of its HELITRONIC VISION machines.

In 2003, the first HELITRONIC VISION was presented at the EMO trade fair. It was the first tool grinding machine with mineral cast machine bed and the linear technology in all three linear axes. It was a milestone in accuracy and surface quality. At the same time, it presented the HELITRONIC DIAMOND, a 2-in-1 eroding and grinding machine on the same machine base.

The latest upgrade came in 2022 with the introduction of the "Laser Contour Check" option. This offers the in-process control of various tool parameters without tool removal. Since this innovation, the HELITRONIC VISION is ready for the unmanned production.

Today, the HELITRONIC VISION is the strongest tool and cutter grinder in the Walter machine portfolio.

HELITRONIC VISION 400 L

The tool grinding machine HELITRONIC VISION 400 L with C.O.R.E.-technology produces rotationally symmetrical tools and production parts of complex geometries in high-precision production. It handles tools with a diameter of 3 to 315 mm, a tool length up to 420 mm and a piece weight of up to 50 kg.

The Walter mineral cast gantry design for optimal tool surfaces. The machine provides you with excellent vibration damping, temperature sensitivity, drive dynamics and ultimately grinding precision.

The new, innovative Laser Contour Check option offers an intelligent measuring system integrated directly in the tool grinding and eroding machine for the highly accurate, non-contact measurement of various tool parameters on cylindrical tools.

All five CNC axes are equipped with linear drives and are controlled by the integrated high resolution measurement systems. They create exact movements while at the same time creating high dynamics.

The HELITRONIC VISION 400 L has a rotary C-axis with a torque drive for very high accuracy and durability.

The rotary A-axis works as a torque motor with a maximum of 750 min-1. It is for extended functionality, such as precise profile grinding or background lines. The tool grinding machine is equipped with a powerful direct driven motor spindle with a spindle end with a liquid cooling system. Spindle performance is 33 KW.

HELITRONIC VISION DIAMOND 400 L

The high-end HELITRONIC VISION DIAMOND 400 L with C.O.R.E.-Technology can erode

tools made of PCD/CBN material and grind tools made of high-speed steel/carbide. It handles tools with a diameter of 3 to 315 mm, with a tool length up to 420 mm and a piece weight up to 50 kg.

The Walter mineral cast gantry design ensures optimal tool surfaces. The machine provides users with the excellent vibration damping, temperature sensitivity, drive dynamics and ultimately grinding precision.

With fine pulse technology, the HELITRONIC VISION DIAMOND 400 L is at the forefront when it comes to quality for PCD tools. It is an economic investment for both the production and resharpening of PCD/CBN tools in the diameter range of up to 315 mm.

It is possible to save time by machining complex geometries in a single clamping cycle. The combination of rotary eroding & grinding provides a real step forward in terms of flexibility and quality. Furthermore, thanks to its Two-in-One principle, the HELITRONIC VISION DIAMOND 400 L can be used as a grinding machine for the production and resharpening of carbide tools. The changeover from PCD to carbide tools is "on the fly", since it is possible to automatically change between PCD and carbide tools and back again.

WALTER has produced tool grinding machines since 1953. Today, its product range is supplemented by tool eroding machines and fully automated CNC measuring machines of the HELICHECK series for contactless complete measurement of tools and production parts.

Walter Maschinenbau GmbH is a company of the UNITED GRINDING Group. Together with EWAG, it considers itself to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, eroding, laser machining, measurement and software.

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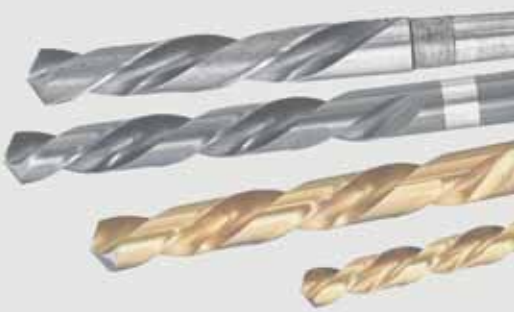

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Precision grinder gives hammer mill its impact edge

Hammer mills are essential pieces of industrial equipment used to crush or pulverise a wide range of materials such as spices, cosmetics, pharmaceutical powders, rocks, minerals and recycling waste. Although the design can vary, hammer mills are a steel drum containing a vertical or horizontal rotating shaft or drum on which hammers are mounted. Within the chamber, the hammers swing freely on a rotor that spins at high speeds while material is fed into the hammer mill from a feed hopper. The material is impacted by the hammers and is thereby pulverised and expelled through a screen in the bottom of the mill.

Since the many internal hammers spin at extremely high velocity to pulverise materials, the point of contact of each hammer must be precisely ground to the correct shape and weight with virtually no variation. Any excess can not only cause severe abrasion but also throw the carefully calibrated machine dangerously out of balance.

"The tip of the hammer travels about approximately 21,000 feet per minute. That velocity leaves little room for imprecision in the hammers, which must be very precisely ground to certain specifications of size, thickness and weight," says Dave Hahn, lab manager for the Pulva Corporation, a leader in pulverising machines since 1938.

He points out that there can be dozens or up to a hundred or more hammers in the largest pulverisers.

To minimise vibration, each of the rotors that the hammers are assembled to are dynamically balanced to an exceptionally tight tolerance. The hammers must also be manufactured to an extremely consistent weight and size. This is critical not only to maintain the balance of all the rapidly swinging hammers but also to provide sufficient clearance within the tight confines of the chamber.

Since the hammers are high wear parts, the tips are hardened to withstand continual impact. However, this requires grinding the "impact" edge to the ideal dimensions for optimal pulverisation of the material.

For hammer mills to reliably function requires extraordinary coordination of all the hammers swinging at extremely high velocity within narrow confines. With great precision, similar to a Swiss watch but on an industrial scale, the end result is exceptionally precise pulverisation machinery designed to last for many years.

With 80 years of experience as a leading supplier of industrial size reduction equipment, Saxonburg, PA, USA based Pulva provides a wide variety of pulverisers and auxiliary equipment. This includes hammer mills of different sizes and capabilities.

"We offer various hammer mills from a very small lab size with only a few hammers, to our largest, which uses over one hundred hammers. We produce tens of thousands of hammers a year, all of which must be extremely precise," says Dave Hahn.

The specialised hammers are manufactured by beginning with either forged carbon steel or stainless steel. However, forged parts can have variances in dimensions, surface finish, and material properties. These variations are inherent to the forging process and can result in slight differences between each manufactured piece.

"There is some weight variation in the forged hammers since there are differences in the material used, the heat, and the forging process itself," explains Dave Hahn.

To increase the durability and longevity of the high wear part, Pulva welds a layer of hardened material on the tip, or impact edge.

According to Dave Hahn, the thickness of the hardened material welded onto each hammer varies depending on several factors but can generally range between 0.25" to 0.5".

To ensure absolute consistency of size and weight of the hammers installed on new equipment, Pulva has relied on advanced rotary surface grinders from Winona, USA based DCM Tech, a designer and builder of industrial rotary surface grinders.

"DCM Tech's rotary surface grinders surface the tip of our hammers down to a specific size, shape and dimension, which

gives us a really good impact edge. The surface grinders take the hardened welded material down to exactly what we need for the hammers," says Dave Hahn.

Pulva ensures that each hammer possesses uniform weight while adhering to essential internal clearances by grinding the hammers' base edges, notes Dave Hahn.

Still, after 20 years of use, Pulva decided it was time to replace one of them and recently purchased its third rotary surface grinder, a more automated, Robot Ready IG 282 SD with a 24" variable speed table and 20HP variable speed grinding spindle motor.

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. Digital technology also allows for an interface with easy-to-use touchscreen controls.

The new model also includes advanced features that automate the initial contact between the abrasive wheel and the part, which typically had to be finessed by the operator. With this updated option, advanced sensor technology detects vibration and can automatically fine-tune not only the pressure

of the spindle motor but how quickly it moves the wheel down onto the part. When the machine senses the abrasive wheel has contacted the part, it automatically begins the grind cycle.

"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," says Mike Anderson, a technical specialist at DCM Tech.

The rotary surface grinding process consistently achieves high throughput and eliminates variability, which enables Pulva to achieve high-quality finished hammers with great consistency.

According to Dave Hahn, the advanced rotary surface grinder arrived "robot ready," allowing Pulva to incorporate robotic elements when needed in the future.

"By adding robotics for the loading and unloading of workpieces, OEMs like Pulva with higher production demands can substantially decrease cycle times while improving precision on unattended machines," explains Mike Anderson.

Although hammer mills are used by many industries to pulverise materials to the required specifications, the precision required cannot be taken for granted. When the hammers must be meticulously ground to precise weights, dimensions and surface conditions, advanced rotary surface grinders are a key technology that will be utilised.

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Creating high performance tools for machining medical components

Optimising medical machining often requires specialised cutters and there's no better model for designing and grinding them than ARCH Cutting Tools, headquartered in Warren, Michigan, USA.

Take the task of machining a polyethylene tibial insert for instance. As ARCH Cutting Tools's northeastern regional director of operations, Jim Gray, says, this has almost always been done with a single, flat blade mounted in a holder so as to maximise the shear angle. However, this design often produces lines on the surface, or an "orange peel" effect, due to burning, as it doesn't cut the polyethylene as cleanly as desired. A straight flute design also impacts the part with a lot of force on each rotation.

Jim Gray's team instead used their knowledge and ANCA's programming software to create a unique 1½", 38.1 mm, diameter 3-flute carbide helical cutter with high shear and multiple radii along the profile. They grind it on an ANCA MX7 machine, using a dozen wheels to create a mirror finish and a cutting edge "sharper than a razor blade," as Jim Gray describes it: "You need a very sharp edge to cut the plastic perfectly cleanly. Even a diamond grain that goes through cutting edge, leaving a tiny chip, will show up in the insert. We inspect these tools under a microscope to confirm the edge is crisp and clean." He adds that their helical design also distributes the cutting forces, in contrast to a straight flute. In sum, the ARCH Cutting Tools solution delivers an outstanding part finish, higher throughput and longer tool life.

Jim Gray also points out that in addition to the tool design assistance derived from ANCA's programming software, which includes full 3D simulation, the ToolDraft feature enables detailed documentation for process control. "Instead of relying on 2D drawings on the shop floor, ToolDraft gives us the ability lay out every aspect of the tool and the required grinding wheels. One page covers the gullet shape, with the roughing wheel, the finishing wheels, and any information related to fluting. The next page covers profiling, again with all the wheel shapes and data and the required clearance angles, land width and other tool geometries and so forth for the end face. We also add notes to each drawing to provide detail on what's pertinent to this tool... what really makes it work.

ARCH Cutting Tools produces a unique 3-flute carbide helical cutter that delivers unequaled part finish, higher throughput, and longer tool life in machining a polyethylene tibial insert

This complex trepan cutter was created to meet an urgent need for cutting non-ferrous material used in respiratory equipment. The tool features a very fine finish and leaves no marks on the part. Gray reported that "the customer was ecstatic"

"We love what ToolDraft does for us. Because if all you put out on the floor is a 2D drawing with an outside diameter or shape of the tool, the operator can say 'This tool is good. It's to print,' when in reality the body's thin and the rake is not right. There are so many things that go into why we designed a tool a certain way, that if we don't get complete information to the operator, everyone can have a different opinion about what constitutes a correct copy. We've promised our customers that no matter what person and what machine grinds their tool, they'll get the same tool very time. And the only way we can keep that promise is with the documentation we've created with ToolDraft."

He adds that although it's possible to grind such tools with a ball screw driven machine, it's much easier to produce them with ANCA's newer linear motor technology: "Linear motors have definitely changed our world when it comes to finishes and transitioning for profile cutters. They make it easier to grind the profile, especially with a tool like a condyle cutter, because multiple radiuses go up and over the edge. If you're grinding in just one direction, a ball screw machine is fine. But if you go up and over and you need to produce multiple radiuses in the front and multiple radiuses in the back, that little backlash or wear in the ball screws will force you to fight until you get it all settled and tweaked in. Whereas with a linear motor machine, it's just true from the start."

These ball nose end mills (for machining hip stems) feature a perfect transition from the ball radius to the OD, and an end face gash that meets exactly at the centre

Moving on to hip stems, Jim Gray says machining up and over these parts requires ball nose end mills in which the radius and its transition to the OD must be perfect. The end face gashing must also meet exactly at the centre: "Any mismatch in the centre of the ball nose will put a line in the hip stem and that's not acceptable. Any error in the radius will create geometrical distortion in the part profile. We scan that whole radius to ensure it's correct."

Hip stems have generally been made of titanium and cobalt chromium. These materials are challenging enough, but the new 3D printed titanium alloys from leading

medical suppliers are even more difficult to machine. They're porous, to facilitate integration with the patient's bone, which essentially guarantees an interrupted cut. The material is also highly abrasive. Thus, minimising tool changes and increasing manufacturing speed to achieve an acceptable level of efficiency requires an engineered solution from the likes of ARCH Cutting Tools.

ARCH Cutting Tools delivered this custom engineered, solid carbide keyseat cutter, with coating, in under 48 hours

Regrinding is yet another such area. Not only does ARCH Cutting Tools reliably return used tools to new condition but there are numerous cases in which they've actually improved upon the original tool.

Jim Gray praises ANCA's integrated laser to automatically check for and correct errors in tool runout and its probing capability. In addition to probing coolant holes to ensure proper tool orientation for a regrind, ANCA makes it easy to probe the entire point profile to enable K-land grinding, a notoriously fiendish task.

From creative tool design to efficient machine setup and operation, to tight quality control, ARCH Cutting Tools consistently exemplifies what it takes to meet the challenges of machining medical components.

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Email: ukinfo@anca.com
www.anca.com

ARCH Cutting Tools created this multi-step counterbore to combine 6 different operations in one tool for machining titanium and superalloys

The importance of strategic cleaning process planning

by Elizabeth Norwood, senior chemist, MicroCare LLC

In manufacturing, meeting the highest quality benchmarks is important. For metal parts this necessitates achieving contaminant-free surface finishes. A pristine surface enhances aesthetics and ensures best functionality and performance.

Achieving high-quality surface finishes relies on effective cleaning processes, removing contaminants like grease, oils, dust, metal filings and fingerprints to enable successful downstream finishing processes such as plating, coating, painting, or welding.

Laying the groundwork for quality surface finishes

Thorough planning of cleaning procedures is an absolute prerequisite before any metal finishing processes can start. This strategic approach ensures that parts meet the most stringent quality and validation criteria. Diligent planning sets up the foundation for achieving successful surface finishes by methodically managing every stage of the production and finishing cycle. The planning process should include:

- Analysing the material composition.
- Identifying and understanding thecontaminants present.
- Evaluating cleanliness specifications and requirements.
- Determining the best cleaning methods and fluids to reach a quality finish.

Manufacturers can proactively anticipate potential challenges through comprehensive planning and tailor their cleaning and finishing processes accordingly. Strategic planning also helps the choice of suitable cleaning equipment and fluids, minimising the risk of costly errors and the need for rework.

Why use vapour degreasing?

Among the various cleaning methods available, vapour degreasing is a highly effective choice for critical cleaning in production and metal finishing. Its performance, cost-effectiveness and flexibility make it a popular solution and offers several advantages.

Thorough and efficient cleaning

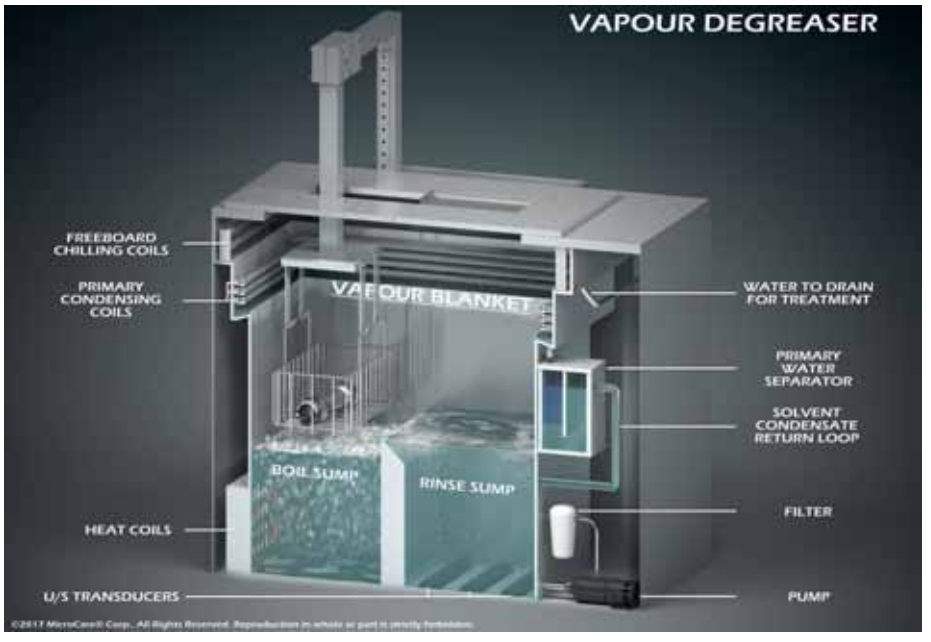
Vapour degreasing cleaning fluids combine high densities, low surface tensions and low viscosities to completely dissolve contaminants and remove particulate from small intricate parts with complex geometries.

Quick turnaround times

The fast and efficient cleaning process enables high throughput, reducing production lead times. Parts can be quickly cleaned and moved through later finishing processes.

Environmentally-friendly and safe option

Vapour degreasing is an eco-friendly choice when used with modern cleaning fluids which boast zero Ozone Depleting Potentials (ODP), low Global Warming Potentials (GWP) and no hazardous air pollutants (HAP). It requires minimal environmental



permits and has a minimal impact when managed effectively.

Cost-effectiveness

Vapour degreasing is cost-effective due to its efficient use of cleaning fluid and reduced waste generation. The cleaning fluid can be recycled and reused hundreds of times, reducing overall costs.

Consistent and repeatable

Vapour degreasers' versatility in accommodating various batch sizes and part geometries ensures stable and repeatable cleaning results, cutting the need for equipment updates for new products of varied sizes or materials. This simplifies validation through a consistent and auditable cleaning process record.

Match contaminants to cleaning fluids

The success of any cleaning process relies on thorough planning which includes selecting the right cleaning fluid and equipment. Factors like the contaminant to be removed, cleanliness specifications and material composition must be carefully considered. Rushing into using a cleaning fluid without thoughtful evaluation can lead to costly mistakes.

Striking the right balance between the cleaning fluid's strength to remove the contaminant and preventing damage to parts materials is vital. Vapour degreasing can be categorised into three main types: mono-solvent, co-solvent and bi-solvent cleaning. To find the most suitable process, it is important to understand the specific contamination, part characteristics and time limitations. Undertaking cleaning trials is

essential to ensure they meet the required cleanliness level.

Mono-solvent

Mono-solvent consists of a single cleaning fluid. They are ideal for effectively removing hydrocarbon-based contaminants, such as stamping oils, machining lubricants and metal shavings.

Some mono-solvents are designed as azeotropes and made with two or more components that form a stable mixture when combined. These have the advantage of behaving as a single solvent during boiling, cooling and distillation. They are typically engineered to make cleaning fluids nonflammable, enhance their cleaning performance, or improve their toxicity profile. They provide the cleaning performance and safety of a mixture of cleaning solvents but with the easy storage, handling and disposal of single or mono-solvent cleaning fluid.

Co-solvent

Co-solvent cleaning takes the efficacy of mono-solvent cleaning to the next level by using two separate solvents. One solvent boils at a high temperature, while the other boils at a much lower temperature. This combination enhances the overall cleaning performance for a broader range of contaminants.

The high-temperature, non-volatile solvating agent dissolves stubborn or more difficult soils, including silicone oils, synthetic greases, grinding media and polishing pastes from the surface of the parts.

The low-boiling, volatile rinsing agent complements the solvating agent by washing it off the components and providing a vapour blanket for added cleaning and drying. Combining these two solvents ensures thorough cleaning and leaves the parts ready for later finishing processes.

Bi-solvent cleaning fluids

For the most stubborn soils, such as thick waxes and viscous metal working fluids, bi-solvent cleaning offers an effective solution, using a two-sump vapour degreaser and a separate preliminary cleaning tank.

The bi-solvent cleaning process starts by immersing the parts in the preliminary cleaning tank holding the high-temperature solvating agent. This dissolves or solubilises the contaminants, breaking them down for easy removal. The parts are then transferred to the two rinse sumps, where the rinsing agent removes the solvating agent and loosens, lifts and washes away any residual contamination.

Co-solvent and bi-solvent cleaning should be reserved for the most difficult-to-remove soils. Not all parts require these more aggressive, high-temperature cleaning techniques and can damage parts if not carefully planned.

Key considerations for selecting cleaning fluids

Choosing the right cleaning fluid is vital for achieving best cleaning performance and ensuring the safety and compatibility of the parts being cleaned. During the planning stage, several key factors should be considered when selecting a cleaning fluid:

Type of contaminant

The vapour degreasing fluid should be compatible with the type of contaminants present on the parts. The cleaning fluid should have the necessary strength and solvating capabilities to remove the contaminants effectively.

Material composition

The cleaning fluid must be compatible with the material of the parts being cleaned to avoid surface damage or degradation.

Environmental and safety considerations

Use environmentally-friendly cleaning fluids to align with sustainability goals and any regulatory requirements. By thoroughly considering these factors and performing cleaning trials with contaminated sample parts, manufacturers can confidently find the most suitable cleaning fluid for their specific application. This comprehensive planning of cleaning procedures, along with selecting the right cleaning fluid, is essential for achieving high-quality surface finishes.

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Optimally adapted solutions for cleaning tasks with highest cleanliness requirements

Efficient, trendsetting and sustainable cleaning technology for all industrial sectors

Thanks to innovative process technology and special high-purity features, the EcoCwave for aqueous media can handle large product quantities efficiently and achieve high purity cleaning results in a stable and resource-saving manner

As an essential step in manufacturing processes, parts cleaning significantly contributes to high product quality and adds considerable value. Therefore, almost all industrial sectors are confronted with more stringent particulate and film-type cleanliness specifications. At MACH in Birmingham, Ecoclean will provide information about its trendsetting product portfolio, which is optimally tailored to fulfil a broad range of cleaning applications with highest cleanliness requirements. By way of example, an advanced EcoCwave machine will be shown live on the stand to illustrate the various features and process options.

Regardless of the industry sector, parts cleaning is one of the critical processes in manufacturing today. Due to increasing demands on component performance and reliability, new products, changed manufacturing, coating and bonding technologies as well as modified materials, the requirements for particulate and film-like cleanliness are constantly rising. This is particularly true in high tech sectors such as the semiconductor supply industry, medical device engineering, aviation and aerospace industry, optical and optoelectronic industry as well as vacuum, laser and analysis technologies. In order to solve these challenging cleaning tasks in a needs-based, efficient and sustainable manner, not only is comprehensive technological know-how required but also knowledge of the applications and respective physical relationships.

As a full-range supplier of future-oriented, flexible and energy-efficient solutions for industrial component cleaning, Ecoclean and UCM, the Group's division specialising in precision and ultra-fine cleaning, have both and cover the entire spectrum of wet chemical processes using water-based media, solvents and modified alcohols. This means that cleaning processes and systems, including the most suitable process technologies such as injection flood washing, spray cleaning, high-pressure, immersion, ultrasonic, megasonic and plasma cleaning, as well as Ultrasonic Plus or Pulsated Pressure

Cleaning (PPC) and drying techniques for both batch and individual part cleaning, can be very efficiently tailored to product and company specific requirements. Machine and process design is carried out in the company's own test centres, which include cleanrooms as well as adapted plant and measuring technology available for tasks in medical technology and for high-purity applications.

At this year's MACH in Birmingham, Ecoclean will inform visitors about its broad range of adapted system concepts for batch and single parts cleaning with aqueous media and environmentally compatible solvents, as well as matching high-purity equipment packages. The latter will be demonstrated on the example of the advanced EcoCwave for immersion and spraying processes with water-based cleaning agents. The system technology, media routing, media preparation and design of this full-vacuum single-chamber system have been specially adapted for high-end cleaning applications. Thus, it is capable of achieving consistent results that meet highest requirements, even if it concerns geometrically complex components. Process options that can be combined in almost any way, such as high-pressure spray cleaning, ultrasonic, plasma cleaning, as well as PPC, contribute to this.

Forward-looking service solutions will be another key focus on Ecoclean's stand. These include an iOS and Android compatible Service app for maintenance and repair requirements, tailored service and maintenance concepts, developments regarding the digitisation of cleaning processes, options for modernising and adapting systems, as well as training programs for customer employees.

The Pulsated Pressure Cleaning (PPC) process option removes contaminants effectively, even from the smallest cavities, finest capillary structures and porous surfaces of complex components

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MACH - Stand: 6-829

MecWash Systems celebrates its 30th anniversary

MecWash Systems, a pioneer in industrial parts washing technology, is celebrating its 30th anniversary. This marks an exceptional journey of innovation, customer focus and commitment to excellence. During this period the company has established itself as a global leader in providing bespoke aqueous parts washing solutions to meet the most stringent demands of manufacturers.

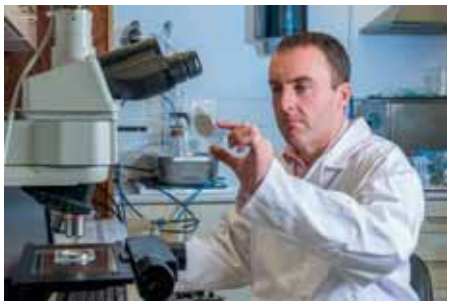
Working alongside some of the most prominent names in manufacturing such as Rolls-Royce, Brompton Bicycle, BAE, Eaton, JCB, Husco, Renishaw and Jaguar Land Rover; MecWash has developed component cleaning systems for the most complex applications. The UK based manufacturer has built unique insight and expertise for solving cleaning challenges across a spectrum of industries, including aerospace, automotive, fluid power, defence and medical.

Early MecWash

MecWash originated as a spin off from an impregnation business and was started by Paul and Steven Young, in 1993. Originally based in Gloucester, the business moved to Tewkesbury in 1998 and then relocated to the other side of the M5 junction in 2005 to its current facility.

John Pattison acquired the business and became managing director in 2008 and has overseen the growth and the progress of the technology since then. John Pattison says: "I am delighted to be part of the MecWash story, and I am excited to see the opportunities for MecWash to develop over the coming years. There have been challenging periods of economic uncertainty during my tenure here, but MecWash is stronger than ever.

"We think that 30 years is a sign of maturity and it is remarkable to see what MecWash has achieved. Our bespoke parts washing systems are now used by the world's leading manufacturers. We are confident of building on our success over the decades to come."



The company's unwavering commitment to sustainability is evident in its focus on aqueous systems, designing and manufacturing durable machines with minimal environmental impact. MecWash machines are built to withstand the rigors of demanding industrial environments, ensuring years of reliable performance.

MecWash evolution

Aqueous washing has progressed enormously during MecWash's lifespan. Thirty years ago, solvent systems were ubiquitous in industry and many engineers were very wary of aqueous cleaning. This has changed substantially with many major manufacturers solely relying on aqueous cleaning and solvents being avoided wherever possible due to environmental and H & S concerns and the regulatory burden.

This evolution was partly driven by environmental regulations such as the 1999 EU Solvent Emissions Directive, that came into full force in 2007, causing a surge in demand for aqueous washers. It was also aided by the substantial improvements in aqueous washing chemistry and technology. MecWash has played a key role in the development of the UK aqueous washing industry. The company has consistently pushed the boundaries, developing the most sophisticated precision parts washing machines.

The first machine produced by MecWash was the MPS. The Mini, Midi and Maxi systems, small medium and large sizes, followed shortly after. These machines offered spray and flood washing, plus rinsing and hot air drying. The Midi evolved to include ultrasonic washing and vacuum drying and became the cornerstone of its range. There are hundreds of Midis in use today throughout the UK and other engineering nations. With this system, MecWash's reputation for solving the most difficult washing challenges was established.

In 2006, the Solo was first produced as a cost-effective spray only interstage washer, before the mid-market general purpose Duo system was added in 2007. Throughout MecWash's life a variety of special purpose system have also been developed, eg a turbine blade washer, a pipe washer, a strip metal washer and various large and complex one-off systems.

In recent years the Mini, Midi, and Maxi have been modernised to the MWX300, MWX400 and MWX600. These machines incorporate greater functionality, easier maintenance and the latest connectivity, for "talking" to customer systems or for Cloud connections.

Embracing technology

John Pattison comments: "MecWash machines have developed considerably over the last three decades. Today, the design, the build and the maintenance of the systems are very sophisticated, just like the

components they are designed for. We understand the manufacturer's process end-to-end and the different applications that require cleaning.

"System integration is part of the MecWash story. It is vital that each system in the range integrates seamlessly with other handling and ancillary equipment. Each MecWash installation is tailored to meet precise requirements of the customer."

In addition to process and machine building skills, the team possess an unparalleled understanding of cleaning chemistry. MecWash has invested in its own laboratory at its headquarters in Tewkesbury. The site is purpose built to design, develop and formulate chemicals for common and bespoke component cleaning applications.

John Pattison continues: "Our expertise in wash chemistry is based on years of experience tailoring chemicals for the most testing wash challenges for individual customers, as well as manufacturing our own range of general wash chemicals and inhibitors.

"It is this fully rounded knowledge of all aspects of cleaning that enhances the analysis and insight our team provides, which gives MecWash the edge. Customers contact the MecWash team to find a solution to their most difficult cleaning issues, components with complex geometries, challenging substrates or tenacious contaminants."

The future for MecWash

Paul Jarrett, sales manager, says: "Since the beginning, MecWash has grown into a global force with customers and distributors in many countries including Europe, India, China and the United States. Working with manufacturers from across the world has given invaluable experience to our team and MecWash has earned a reputation for reliability and performance and we continue to build on that.

"With our traditional applications from across manufacturing being supplemented by new industries, for example automotive electrification, there will always be new challenges for us to solve and that excites the team.

"At MecWash, we understand that a manufacturing process is only as strong as its weakest link, so we are making sure that MecWash cleaning technology embraces and supports the progress of intelligent manufacturing, continuing to provide enhanced efficiency, reliability, integration and quality for the manufacturer."

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MACH - Stand: 18-115

ActOn Finishing to showcase the latest surface finishing technology at MACH

A UK leader in surface finishing, ActOn Finishing is happy to announce its presence at the MACH exhibition. Its stand will showcase the latest in surface finishing technology, including the new AWB wet blasting cabinet and one of the fastest finishing machines on the market, the CHE50.

With a legacy dating back to 1965, ActOn Finishing has emerged as a prominent family business dedicated to delivering exceptional surface finishing products and services.

Throughout its journey, it has focused on designing, developing and manufacturing high-standard solutions for surface finishing, shot blasting, waste water treatment and ultrasonic cleaning. ActOn's comprehensive end-to-end offerings cater to a diverse range of industries, providing them with reliable and efficient solutions to meet their unique needs.

This year ActOn Finishing is proud to showcase at MACH its latest and complete surface finishing solutions, developed and manufactured to improve customers' manufacturing process. During the show visitors can discover:

• AWB Wet Blasting Cabinet is ergonomically designed for easy operation in sitting or standing position, for cleaning, descaling, deburring, roughening, oil or grease removal, die cleaning.

• CHE50 Centrifugal High Energy Machine is built to be 10 times faster than vibratory finishing, producing superior finishes.

• DTB50 Centrifugal Disc Machine is a reliable, fast and easy to operate machine, perfect for delicate components.

• DLyte100 is a dry electropolishing machine which can achieve high quality finishing for machined, sintered and casting parts, obtaining a mirror finish result in a short time.

• 5+5 Dual Vibratory Finishing Machine is a space-saving vibratory machine which allows you to carry out dry and wet processes in one unit.

• Ultrasonic cleaning technology is designed to clean, descale and strip a large range of components, for a range of industries such as automotive, aerospace, energy, electronics, food, graphics, jewellery, manufacturing, marine, mould cleaning, medical, optical and more.

• Batch Centrifuge is designed to work in the most effective manner to treat the discharge water from mass finishing, either suitable for recycling or discharge to the foul drain as dictated by the process.

Why you should visit stand 6-821

This year you can find the ActOn Finishing at Stand 6-821 and if you wonder why you should stop by its stand, here are just a few reasons:

• It will showcase a wide range of surface finishing machines. From the vibratory finishing bowl and centrifugal high energy machines to the ultrasonic cleaning system and the DLyte Dry Electropolishing technology.

• In addition, it will exhibit a large range of finished components. This means you will be

able to gain a firsthand impression of the results you can achieve using ActOn's technology. From deburring, descaling, degreasing, cleaning and smoothing to polishing, burnishing, radiusing, super-finishing and much more.

• ActOn Finishing has prepared some of its most comprehensive case studies. These will cover examples from industries such as aerospace, additive manufacturing, automotive, general engineering and medical. Find out how ActOn technology benefited the industry by reducing processing times and producing a repeatable and quality product. No need of fixturing, no part impingements, no part dimensional changes, just using the right finishing machine and consumables.

• You will find out how mass finishing can help you reduce processing times in comparison with manual finishing, without increasing costs. Learn how to produce a consistent finish and avoid high part rejects rates.

• ActOn team is more than happy to discuss any of your finishing requirements or issues. It will be available to answer your specific questions in surface finishing and it will offer you guidance tailored for your finishing needs.

• If you are not interested in purchasing a machine, the company can also offer a wide range of finishing services. From vibratory and centrifugal high energy finishing subcontract to shot blasting and peening, precision polishing and inspection, ActOn offers complete surface finishing solutions. More important, all of its finishing services are tailored to your needs.

• You can start your ActOn experience by requesting a free processing trial. The technical team will guide you on how to apply for your free trial. Or you can complete the trial form before and bring it with you at MACH. You can download it here: ***https://acton-finishing.co.uk/free-trial/***

With a commitment to delivering precision and quality, ActOn Finishing plays a pivotal role in elevating the overall standards of the manufacturing sector, offering comprehensive solutions for perfecting the final touches on your components. During the last 60 years, ActOn has strived to consistently maintain a strong reputation for quality and service on the UK market and globally. One of its main goals at the MACH exhibition is to showcase its cost-effective and efficient finishing technology and to continue to offer tailored solutions to the manufacturing sector.

ActOn Finishing has chosen MACH as a platform for exhibiting its surface finishing solutions because this show is the UK's national event for inspiring innovating and connecting manufacturing. The initiative showcases new technology that is readily available to UK manufacturers, helping you to understand the potential adopting such technology can bring to your operation, as well as when to adopt it and how to implement it the most effectively.

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Choosing robotic abrasive blasting is easier than you might think

The unique Blastman robot delivers innovative solutions, applying the latest advanced technologies to overcome blast cleaning challenges.

Considering the investment of a robotic abrasive blasting line, whether completely new or retrofitted, can understandably raise many questions. One of the most essential being how the correct solutions for the customer are determined. In short, as the operations of Blastman Robotics are based on customer needs and backed by four decades of experience, there is no situation where a similar process hasn't already been solved.

Everything starts from the customer's production and workpiece. Important factors include the size and shape of the workpiece, the desired quality from the result, as well as the production volume. In other words, the customer's core business.

The next step is to specify whether Blastman's robotic solution is to be retrofitted into an existing chamber, or a completely new chamber. In addition, there's a hybrid solution in which an existing chamber is remodeled through, for example, raising its roof.

Naturally, customer's existing production methods are taken into close consideration as they might necessitate certain solutions. The blast cleaning process is not only the act of abrasive coming out of the nozzle. As a whole, it includes transportation solutions, variations in workpieces, different quality requirements, fluctuations in energy availability and tens of other sub-processes that enable the actual cleaning of the surface. Blastman has developed solutions specifically keeping in mind the individual characteristics of customer processes and logistics.

Fitting solution

The purpose of the initial specifications is to make sure that the robot fits into the chamber with the workpiece so that the product can in fact be processed completely. This is very easy and only a 3D model of the workpiece and the dimensions of the chamber are needed. This combination together with the production volume in turn defines which specific robot model and add-ons, such as machine vision and manlifts, should be chosen.

Currently, Blastman's portfolio consists of eight robot models, which are tailored to fit customer needs. This in addition to Blastman's ability to listen to its customers ensures that customers do not have to wrestle with their process alone and through a collaborative effort, the right solution is always found.

With very little information Blastman is able to provide data on how a robot would optimise the customer's production and offers the service free of charge. The customer is always presented with technical drawings that show the robot can operate even with the largest workpiece. Blastman also offers a simulation showing that the robot will reach the production efficiency that has been promised. All of this also makes it very easy for the customer to get a quotation for a solution that really solves any existing production or process issues.

Automation makes robotic abrasive blasting even easier

After the initial specification, Blastman and the customer can dive into more detailed matters. These can even entail factors not directly concerning robots, such as possible hick-ups in other equipment, like abrasive handling and how Blastman can solve those as well.

If, for example, inspectors or manual blast cleaners are having a hard time getting on top of the workpiece, Blastman can provide mechanical solutions or machine vision to help with workpiece positioning inside the blast chamber. Another example is the possibility of choosing energy-saving upgrades to existing equipment or including a gantry-mounted man lift for painting operations. The question with Blastman is merely about the desired level of automation and way of working, allowing improved quality and decreased production costs.

The efficiency of robotic abrasive blasting is often easiest to realise through comparison. Back in the day four workers were able to manually blast on average 15 m^2/h, nowadays a robot can process 200 m^2/h. With a ratio like this, the easy assumption might be the famous reiteration about robots and jobs.

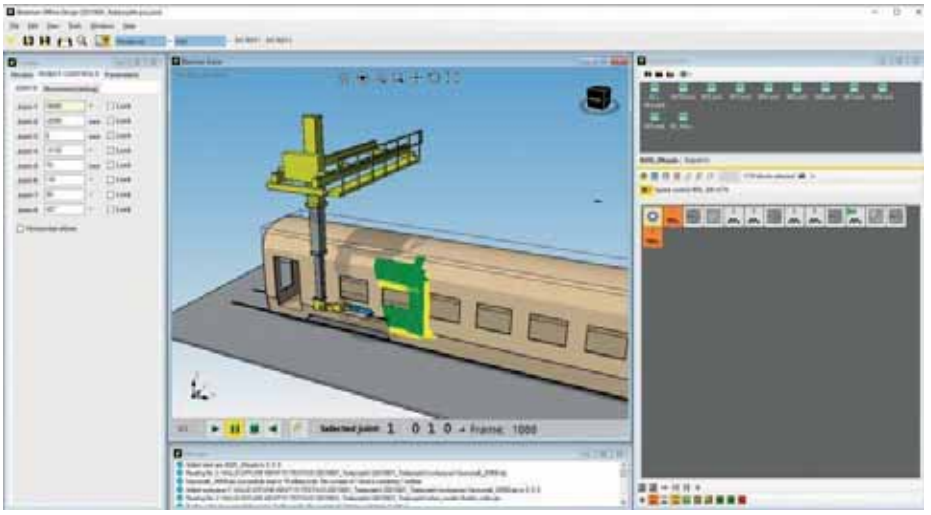
In reality, robotic abrasive blast cleaning rather transforms the nature of human labour than eliminates it. Instead of actual blasting, the workers can orient into the maintenance of the process, consisting of preparing hoses, adding abrasive, cleaning up, as well as preparing, loading and unloading workpieces.

It is also not uncommon for blast cleaners to transition into robot operators. Today a manual blast cleaner is extremely hard to find while a robot operator is a different level position that workers enjoy and are less eager to change for another job.

Meanwhile, Blastman has made sure that all operating and maintenance tasks of the robotic abrasive blasting are on a level that doesn't require major education or a decree. In other words, the people don't disappear

but are freed to handle other tasks and become more efficient all the while keeping the know-how in the house.

What is most important though, is that the transition from manual blast cleaning to other endeavors removes people from the same space with the grueling abrasive process and thus tremendously improves occupational safety.



Easy programming enables even smoother production

Many customers may wonder how the programming of the automated robotic blasting works with their process and how the production will run after the robotic solutions have been implemented.

First of all, the programming with Blastman's tools is very easy and secondly, the company has developed automation for programming, making it even easier and faster in the future. With its aid, the programming can be started well in advance. Once the design is complete, 3D models can be entered, and customer programs created while the robot is still being manufactured. This way, when the robot is deployed, there exists a ready-made library of programs to choose from.

The easiness of programming is also demonstrated to customers during the sales process. This way customers can have confidence in the overall solution they are purchasing.

Naturally, Blastman trains all the necessary personnel of its customers, whether they be operators or maintenance workers, and offers on-site support as production is on the way. Instructions and interface are provided in the local language and, if necessary, an interpreter can be used.

Additionally, as the production is on the way, Blastman's robots are able to notify the operator through a built-in system if something is wrong and more importantly, about to go wrong. The feature has two main benefits: the best maintenance is preventive maintenance, and if another shift is not aware of something, the robot still knows and reminds about it.

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Guyson robot blasting for stainless flow metres

Skipton-based finishing equipment manufacturer Guyson International recently designed, constructed and deployed a Guyson RB10 PF robotically controlled blasting system for a world-leading manufacturer and supplier of industrial process instrumentation. This system has been customised to deliver a fine cosmetic finish to various stainless flow metres.

The Guyson RB10 blast cabinet incorporates a compact 7-axis turntable at its core, facilitating precise component rotation to ensure thorough exposure to the blast nozzles. This method provides a clean and uniform finish across all component surfaces undergoing blasting, a critical requirement in industries where consistency is demanded. The blasting process employs two pressure-feed blast nozzles mounted on an ABB IRB 1600 robotic arm, guaranteeing a level of blasting consistency unattainable with manual or alternative automatic methods.

A Guyson Cyclone Reclamator is positioned above a sieving system and the G55 Pressure Pot to uphold media quality during blasting and achieve a more uniform surface finish. Furthermore, to address high throughput demands, the machine features a specially designed C800 Dust Collector mounted at an extended height to accommodate a heavy-duty waste bag.

The sophisticated blast system is overseen and managed via a PLC/HMI graphical display, providing real-time visual feedback on system operation. Users can customise and establish up to ten recipes for the machine's operation through this interface. Among the parameters adjustable within these recipes are blasting pressure, activation or deactivation of blast guns, air wash pressure settings and blast gun traversal speed over the component. The capability to modify several parameters to adapt to evolving production requirements ensures exceptional flexibility and efficiency throughout the machine's lifespan.

In line with Guyson's steadfast commitment to innovation and customer satisfaction, the company is also currently in the process of constructing its state-of-the-art testing and demonstration facility. This facility is poised to make a significant impact upon its grand opening, proudly claiming the title of the largest blast finishing and ultrasonic cleaning test and demonstration facility in Europe.

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